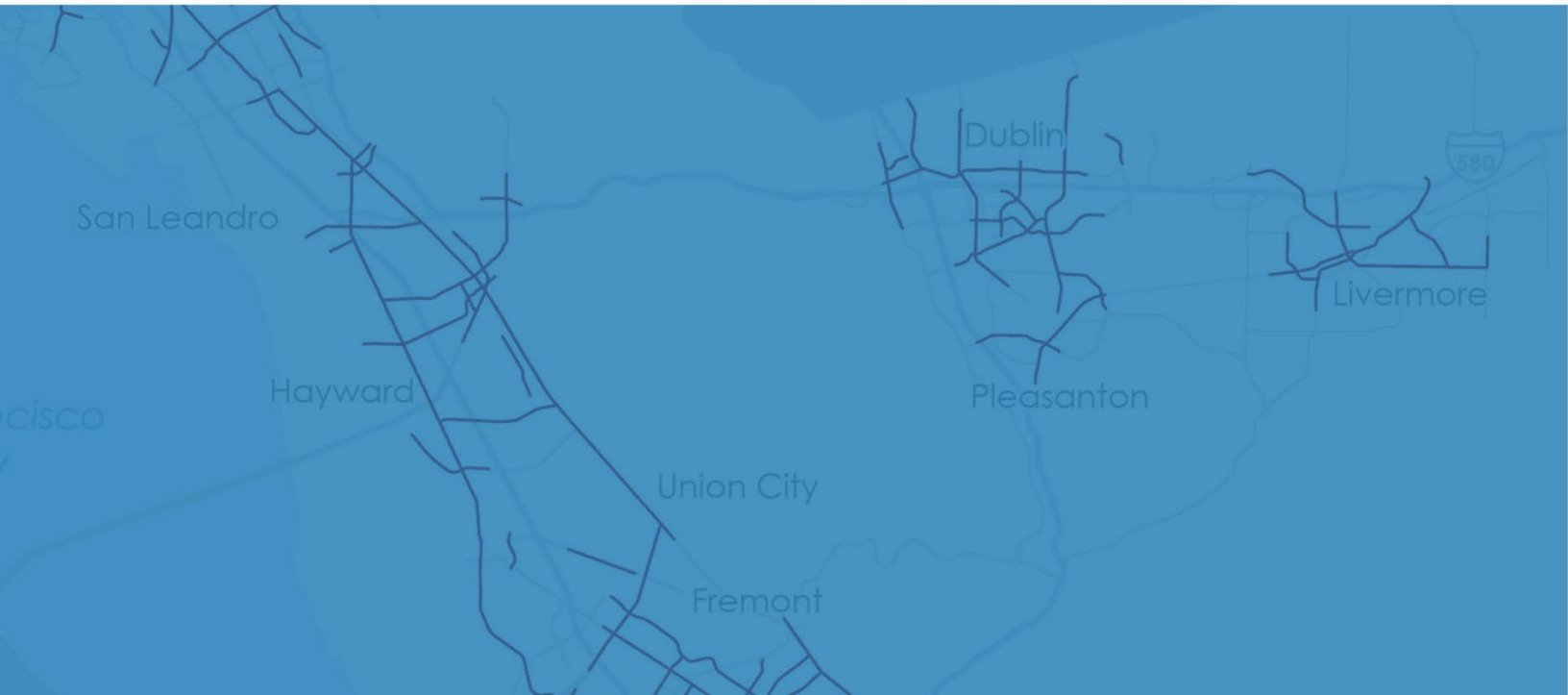
Exhibit 2 Item 6-A
Transportation Commission Meeting
May 28 2025

ALAMEDA
County Transportation Commission

High-Injury Network and Proactive Safety Network Report

SEPTEMBER 2024



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INTRODUCTION

As part of the 2020 Countywide Transportation Plan (CTP), the Alameda Countywide Transportation Commission (Alameda CTC) adopted the Safe System Approach as one of its core strategies to improve safety in the county. The Safe System Approach describes ways to address the root causes of traffic fatalities and serious injuries using six principles that acknowledge people make mistakes and emphasize reducing the severity of collisions when they do happen. The six principles are accompanied by a set of five elements: safer people, safer vehicles, safer speeds, safer roads, and post-crash care. The six principles and five elements of the Safe System Approach are illustrated in **Figure 1**. The two networks in this report will help Alameda CTC implement the principles of the Safe System Approach.

2026 CTP and Advancing the Safe System Approach

The Policy Blueprint (Blueprint) builds on the transportation vision of the 2020 CTP with updated goals for safety, equity, climate, and economic vitality. While Alameda County jurisdictions have made significant efforts to improve safety, deaths from traffic collisions remain unacceptably high. The 2026 CTP continues the agency's commitment to achieving the safety goal using the Safe System Approach.

The Blueprint policy objectives and safety analysis aim to identify locations with the highest safety need. This analysis includes the development of two networks: a High-Injury Network (HIN) that identifies corridors with a history of the most fatal and severe collisions, and a Proactive Safety Network (PSN) that proactively identifies locations with expected safety needs given current conditions. Focusing resources on these networks will help advance the CTP goal to reduce fatal and serious crashes towards zero in Alameda County. This report documents the data sources and methodology used to develop the two networks, as well as high-level findings and some technical limitations.

Figure 1: The Safe System Approach Wheel

Source: Federal Highway Administration (FHWA)

Vulnerable Users Bear the Brunt of Collision Impacts

Walking and biking comprise **only 4%** of commute trips in the county, but

41% of traffic fatalities from 2018 - 2022 affected someone **walking or biking**

Source: TIMS; US Census Bureau

THE HIGH-INJURY NETWORK

Alameda CTC developed its first High-Injury Network (HIN) in 2019 as part of the Countywide Active Transportation Plan (CATP). The agency is updating the HIN as part of the 2026 CTP. The sections below provide an overview of the purpose and application of Alameda CTC's HIN.

What is an HIN?

HINs are one of many tools agencies around the country use to reduce fatal and severe collisions on roadways. They identify corridors where severe collisions are most concentrated, typically using three to five years of the most recently reported collision data. HINs are effective at identifying corridors with known histories of fatal and serious collisions; however, they do not typically account for contextual factors that contribute to collision history, or the potential impact of future development. Consequently, not all roads on the HINs are indicative of where crashes might happen again.

How has Alameda CTC used HINs?

Alameda CTC developed two HINs as part of the 2019 CATP: one for pedestrian collisions and another for bicycle collisions. These HINs have served multiple important purposes, including as a:

- Guide for capital investments to reduce fatal and severe collisions.
- Resource to facilitate discussions with external stakeholders and elected officials regarding the significance of transportation safety.
- Means for highlighting the agency's commitment to data-driven decision-making.
- Communication tool to build public and political backing for safety investments.
- Means to describe the disproportionate impact of traffic violence on historically marginalized communities.

What is the difference between a countywide and a local HIN?

Alameda CTC's HIN locates concentrations of collisions throughout the county using a consistent methodology capturing the diversity of jurisdictions, land uses, and travel patterns across the county. Many jurisdictions in Alameda County have local HINs, however there is not consistency between methodologies, which have been tailored to identify streets with the highest concentrations of collisions relevant to that community. As a result, some locations may appear on a local HIN that are not included on the countywide HIN.

2024 HIN Update

Alameda CTC is updating the countywide HINs to incorporate more recent collision data. The most recent five-year data available at the time of the analysis covers 2018 through 2022. This provides Alameda CTC with an opportunity to see how patterns have changed from previous years. This update also provides an opportunity to modify the HIN methodology to ensure consistency with evolving best practices.

Methodology

The following sections describe the approach for the 2019 HIN and the limited changes applied to the 2024 methodology.

2019 HIN Methodology

In 2019, with input from city and agency stakeholders and the Countywide Bicycle and Pedestrian Advisory Committee, Alameda CTC adopted the first Bicycle and Pedestrian HINs as part of the CATP.

The 2019 HINs used collision data from the University of California, Berkeley, Transportation Injury Mapping System (TIMS) database and the California Statewide Integrated Traffic Records System (SWITRS) database. The dataset included collisions from 2012-2016 on public streets and roads throughout incorporated and unincorporated Alameda County excluding collisions on access-controlled facilities like freeways.

Collision data were weighted by severity, with fatal and serious crashes weighted 10 times higher than Property Damage Only (PDO) crashes, and crashes that resulted in visual injury or complaint of pain weighted five times higher than PDO crashes. The weighting factors intentionally weigh fatal and severe injuries equally to recognize that the difference between a severe injury crash versus a fatal crash are often more of a function of the individuals involved and, therefore, both represent opportunities for safety improvements.

The severity-weighted collisions were then aggregated into quarter-mile street segments where each segment was given an associated severity score. Then, to account for different bicycle and pedestrian exposure levels in each jurisdiction, U.S. Census data on walking and biking commute levels (e.g. mode share) for each jurisdiction was used to categorize each segment as high, medium, or low exposure level.

Segments with the top 20th percentile severity scores within each exposure category were selected as high-injury segments, which were then smoothed into a network of corridors. This was achieved by connecting small gaps between high-injury segments. These smoothed corridors formed the 2019 Bicycle and Pedestrian HINs.

2024 HIN Update Methodology

While the 2024 HIN primarily uses the 2019 methodology, it incorporates minor changes such as:

- Updating collision data years and U.S. Census data years from 2012-2016 to 2018-2022.
- Removing PDO crashes from Bicycle and Pedestrian HINs to stay consistent with the Safe System Approach, which focuses on eliminating fatal and severe injury collisions. Additionally, PDO crashes tend to be underreported and inconsistently documented, especially when involving bicyclists or pedestrians.

To be consistent with the 2019 methodology, collisions resulting in more severe outcomes received greater weight. Fatal or severe injury collisions received a score of 10, and visual injury or complaint of pain collisions received a score of five.

The agency then followed the 2019 HIN methodology of aggregating severity scores into quarter-mile segments, and then applied an exposure level category of high, medium, or low based on the most recent biking and walking commute level data from the U.S

Census. The walking and biking exposure levels for each jurisdiction are shown in **Table 1** and **Table 2** respectively.

Table 1: Walking Exposure Level based on 2018-2022 Commute Mode Share

Jurisdiction	Walking Commute Share (2018-22)	Exposure Level (2018-22)
Berkeley	13.4%	High
Emeryville	5.9%	Medium
Albany	5.2%	Medium
Oakland	3.3%	Medium
County Mean	2.8%	
Alameda	2.6%	Low
Pleasanton	1.8%	Low
Piedmont	1.8%	Low
Newark	1.7%	Low
Dublin	1.5%	Low
San Leandro	1.5%	Low
Ashland	1.4%	Low
Fremont	1.2%	Low
San Lorenzo	1.2%	Low
Livermore	1.1%	Low
Cherryland	1.1%	Low
Castro Valley	1.0%	Low
Hayward	0.9%	Low
Sunol	0.7%	Low
Union City	0.6%	Low
Fairview	0.2%	Low

Source: US Census Bureau, ACS 2022 5-Year Estimates

Table 2: Biking Exposure Level based on 2018-2022 Commute Mode Share

Jurisdiction	Biking Commute Share (2018-22)	Exposure Level (2018-22)
Berkeley	4.9%	High
Albany	4.3%	High
Emeryville	2.4%	Medium
Alameda	2.3%	Medium
Oakland	1.9%	Medium
Ashland	1.4%	Medium
County Mean	1.4%	
Livermore	1%	Low
Newark	0.9%	Low
Pleasanton	0.8%	Low
Castro Valley	0.6%	Low
Piedmont	0.4%	Low
Fremont	0.4%	Low
San Lorenzo	0.4%	Low
Hayward	0.4%	Low
Union City	0.4%	Low
Dublin	0.3%	Low
San Leandro	0.2%	Low
Cherryland	0.1%	Low
Sunol	0%	Low
Fairview	0%	Low

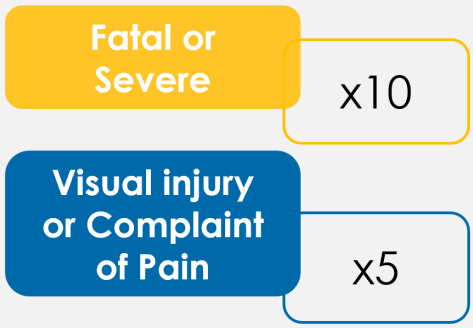
Source: US Census Bureau, ACS 2022 5-Year Estimates

Following the application of the exposure level categories, the top 20 percent of segments in each exposure level category were smoothed into continuous corridors similar to the 2019 HIN. The HIN development process is summarized below.

2024 HIN Methodology

1. **Collect & map data:**
   Collisions from SWITRS 2018-2022

2. **Apply severity weight:**



3. **Aggregate into corridors:**
   Quarter-mile sliding window

4. **Apply exposure weight:**
   Based on bicycle and pedestrian commute rates by Jurisdiction

5. **Select top 20% of severity scores:**
   Bike and Pedestrian HIN

HIN Finalization

To finalize the HIN, similar to the 2019 process, the HIN required some manual modifications. Jurisdictions reviewed these adjustments and provided additional ones for consideration. These generally included:

1. Closing ½ mile gaps in incomplete corridors
2. Removing minor/short intersecting segments
3. Connecting concurrent segments with changing street names

Engagement and Review Process

Alameda CTC shared the updated HIN methodology with the Bicycle and Pedestrian Advisory Committee (BPAC) and the Commission, and shared the draft updated Bicycle and Pedestrian HINs with the Active Transportation Working Group (ATWG) comprised of jurisdiction staff.

Some of the common themes across comments received during this engagement process included the following:

- Recommendations to combine the Bicycle and Pedestrian HINs into one combined Active Transportation HIN.
- Concerns regarding the outlier nature of data that spans the COVID-19 Pandemic, and the continued value of the pre-pandemic HIN.
- Encouragement to focus on the Safe System Approach principles and increased interest in a more proactive safety assessment.
- Requests to add and adjust specific corridors that have known safety issues but might not have had past severe collision history.

Data Limitations of the HIN

Since the HIN is based on collision history, it does not tell the full story of roadway safety in the county. Although the HIN collision data is normalized by walking and biking exposure levels, it is still difficult to compare high-injury segments across the county given the vast differences in land use and roadway characteristics between different jurisdictions.

While HIN segments in a low exposure jurisdiction have fewer severe or fatal collisions on average compared to HIN segments in a high exposure jurisdiction, this disparity in collision levels does not fully reflect existing conditions related to safety. Factoring in additional context such as roadway characteristics into the identification of segments with high safety needs can help overcome this limitation.

Additionally, collision data is subject to data reporting limitations and biases, which can misrepresent roadway safety conditions. These limitations include:

- Underreporting of collisions involving pedestrians, cyclists, or motorcyclists.[1]
- Underreporting of collisions involving people of color or undocumented individuals.[2]
- Inaccurate reporting of collision severity in police-reported data.[3]
- Bias and missing data fields.[4]
- Inherently outlier nature of collisions and the exclusion of near-misses from the analysis.
- Unclear impact of COVID-19 Pandemic on collision data.

The 2026 CTP approach for addressing these limitations is described in the 2024 PSN section.

Combined Active Transportation HIN

The 2024 update to the HIN is a combined Active Transportation HIN instead of separate Bicycle and Pedestrian HINs. Bicyclists and pedestrians are both vulnerable roadway users, and segments that are on the HIN due to a concentration of severe bicycle collisions are likely segments where pedestrian safety should be considered as well, and vice versa. Combining the two HINs into one Active Transportation HIN enables Alameda CTC and partner jurisdictions to prioritize safety improvements on segments that will benefit both bicyclists and pedestrians.

Continue to Leverage the 2019 HIN

Based on feedback related to the outlier nature of pandemic-era data and its potential impact on the 2024 HIN, the agency plans to use the 2024 HIN in tandem with the 2019 HIN to provide a comprehensive countywide HIN.

2024 HIN Update

Figure 2 shows the 2024 HIN overlayed with the 2019 HIN, highlighting segments that lie on both the HINs. **Figure 3** through **Figure 6** show the HINs within each planning area.

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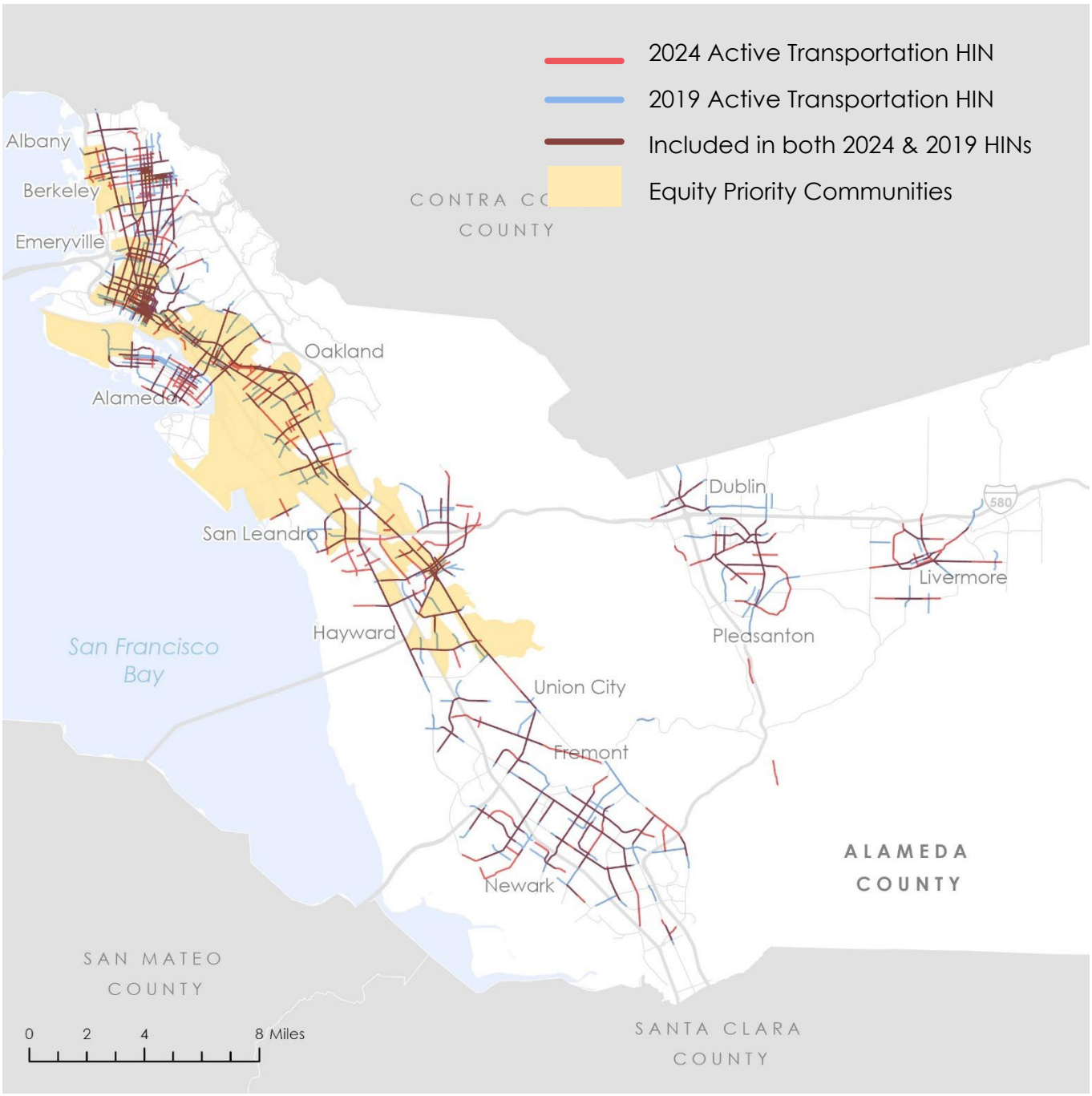
[1] Lombardi LR, Pfeiffer MR, Metzger KB, Myers RK, Curry AE. "Improving identification of crash injuries: Statewide integration of hospital discharge and crash report data." Traffic Inj Prev. 2022;23(sup1):S130-S136. doi: 10.1080/15389588.2022.2083612. Epub 2022 Jun 13. PMID: 35696334; PMCID: PMC9744954.

[2] Sciortino Stanley, Mary Vassar, Michael Radetsky, and M Marget Knudson. "San Francisco pedestrian injury surveillance: mapping, under-reporting, and injury severity in police and hospital records." https://pubmed.ncbi.nlm.nih.gov/16084782/

[3] San Francisco Public Health Department. "San Francisco Severe Traffic Injury Trends: 2011-2020." https://www.visionzerosf.org/wp-content/uploads/2021/11/Severe-Injury-Trends_2011-2020_final_report.pdf

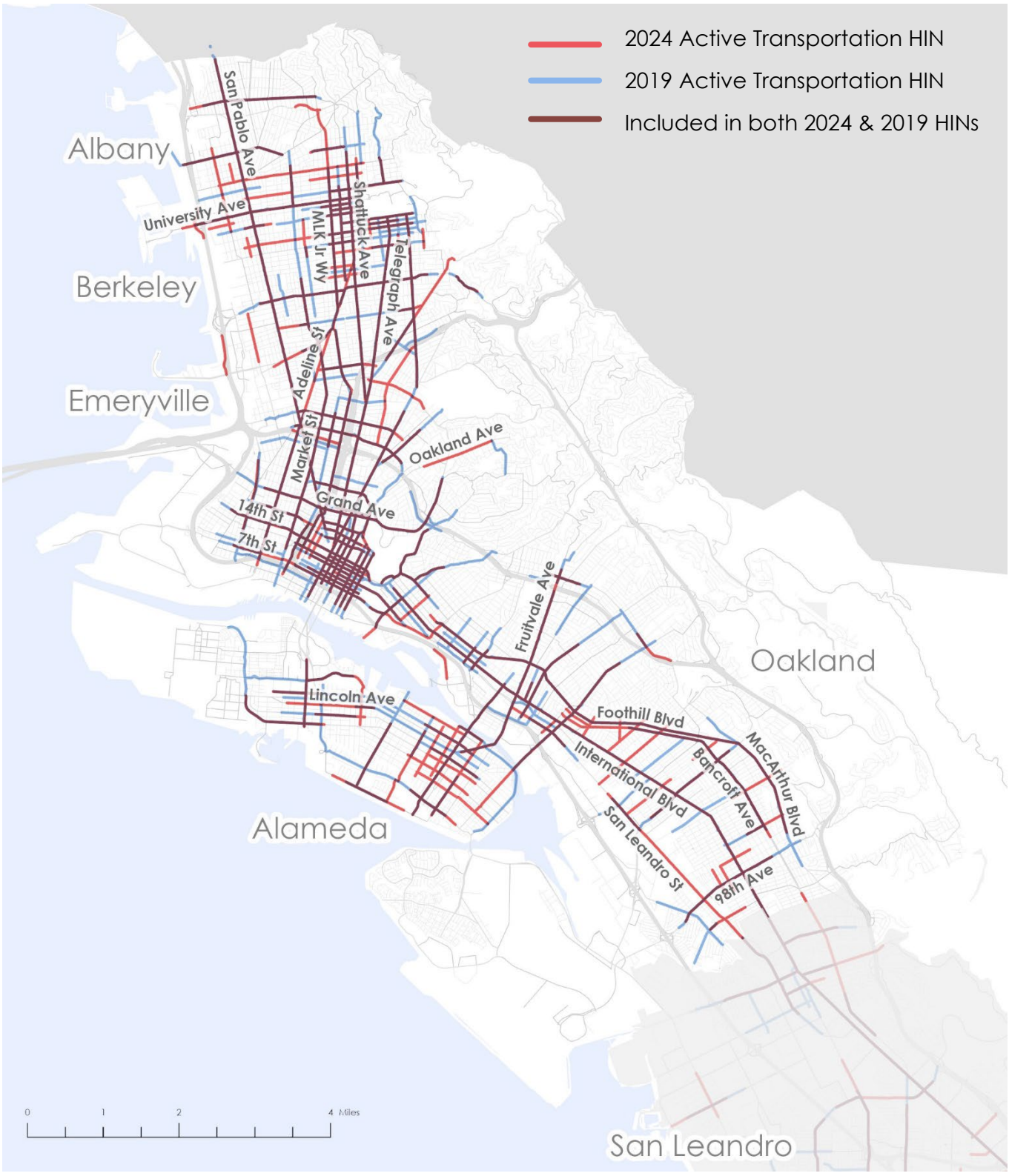
[4] Kibrom A. Abay, "Investigating the nature and impact of reporting bias in road crash data", Transportation Research Part A: Policy and Practice, Volume 71, 2015, Pages 31-45, ISSN 0965-8564, https://doi.org/10.1016/j.tra.2014.11.002. (https://www.sciencedirect.com/science/article/pii/S0965856414002687)

Figure 2: Map of 2019 and 2024 Active Transportation HINs



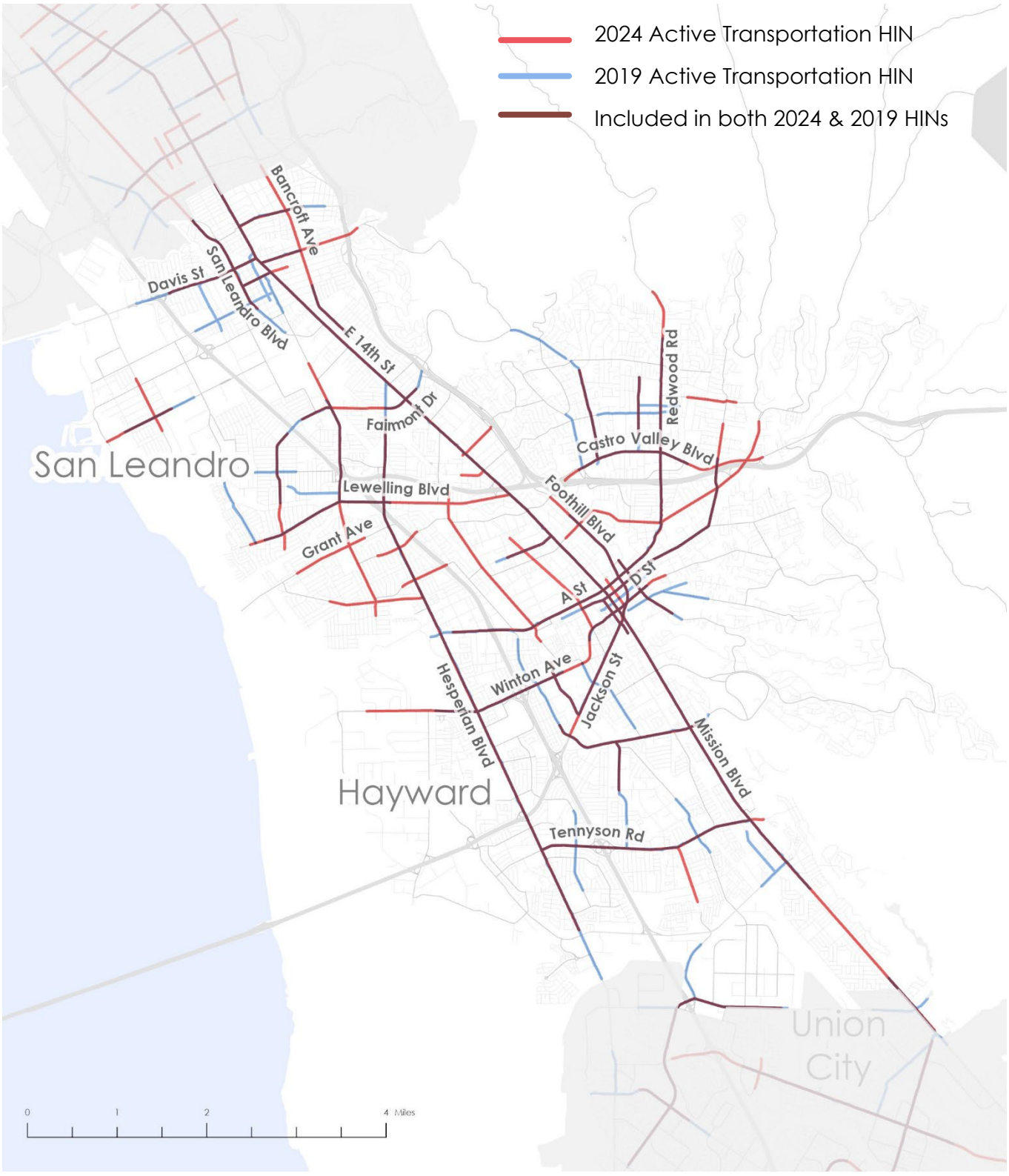
Source: Fehr & Peers, 2024

Figure 3: Map of 2019 and 2024 HINs in the North Planning Area



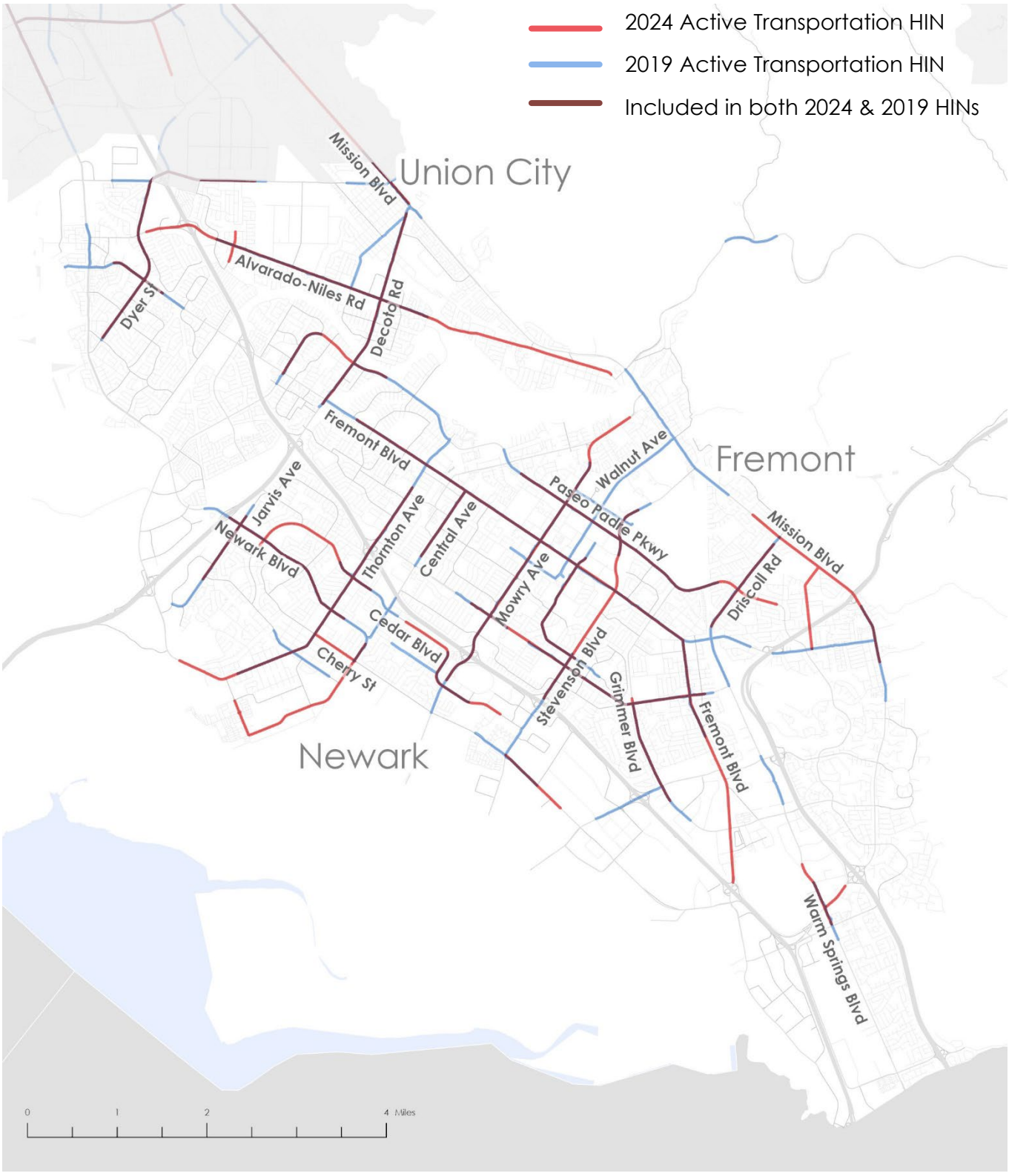
Source: Fehr & Peers, 2024

Figure 4: Map of 2019 and 2024 HINs in the Central Planning Area



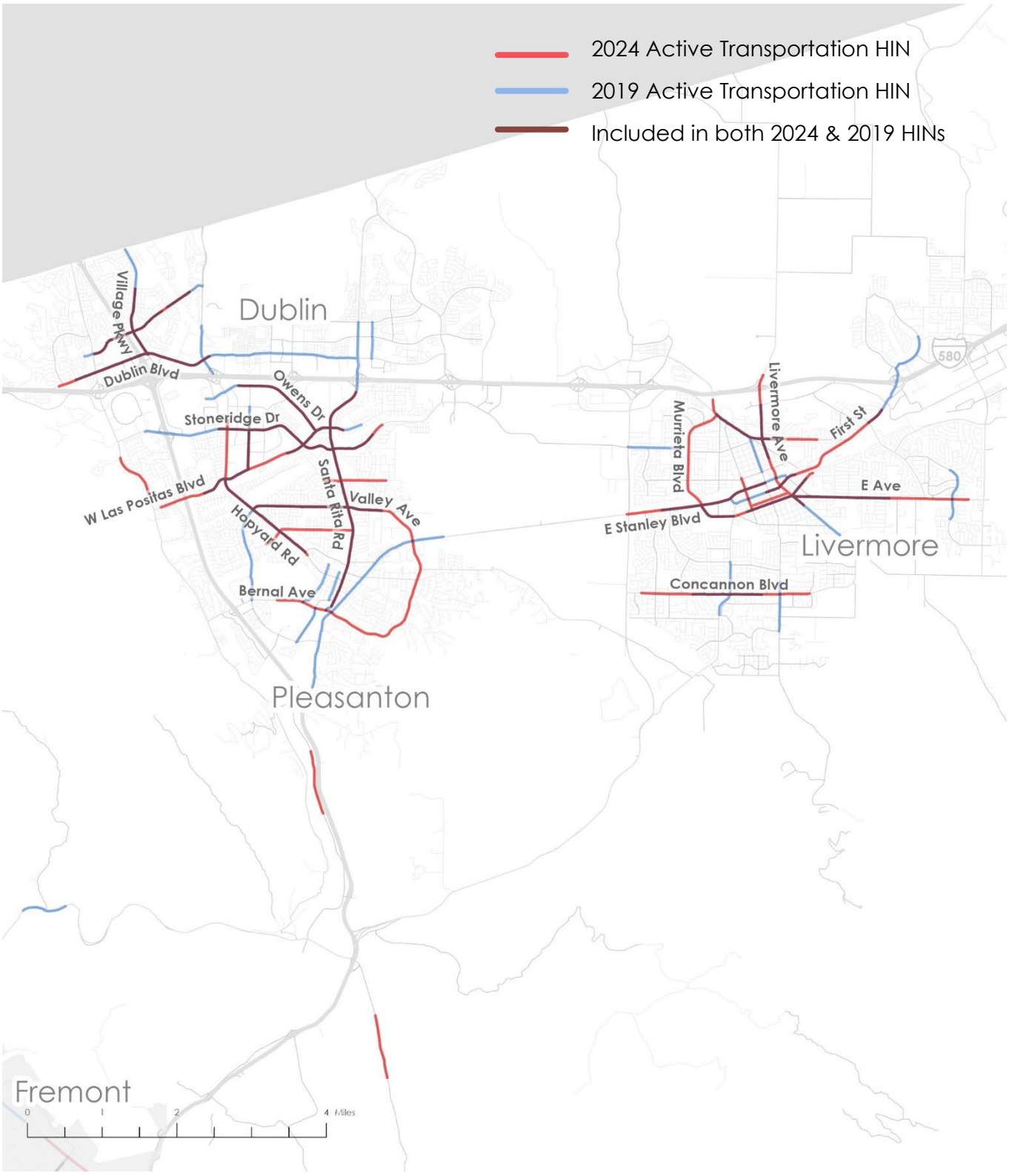
Source: Fehr & Peers, 2024

Figure 5: Map of 2019 and 2024 HINs in the South Planning Area



Source: Fehr & Peers, 2024

Figure 6: Map of 2019 and 2024 HINs in the East Planning Area



Source: Fehr & Peers, 2024

Findings

The total mileage of the 2024 Active Transportation HIN is 334 miles, which accounts for about 8% of the countywide street network. Approximately 70% of all injury pedestrian and bike collisions occurred on the 2024 HIN. The distribution of the 2024 HIN across planning areas is similar to the 2019 HIN as shown in **Table 3.**

Table 3: Distribution of HINs across Planning Areas

Planning Area	% of Total Street Miles in Planning Area	% of 2019 HIN	% of 2024 HIN
North	33%	50%	48%
Central	21%	19%	22%
South	19%	17%	16%
East	17%	12%	12%

Note: Approximately 10% of the total street network and 1% of the HIN lies within non-urbanized county.

Both the 2019 and 2024 HINs are overrepresented in Equity Priority Communities[5] (EPCs) and Priority Development Areas (PDAs). While EPCs include 18% of the total street network, they account for over 40% of the 2019 and 2024 HINs. Similarly, PDAs include 23% of the total street network but include over half of the 2019 and 2024 HINs. These findings underscore the disproportionate safety burden in EPCs and indicate the importance of investing in safety in equity communities, as well as near new development. A complete list of corridors on the 2024 HIN within each Planning Area is provided in **Table 5** included in the Appendix.

[5] Equity Priority Communities analyzed are those identified in MTC's Plan Bay Area 2050.

The 2024 HIN accounts for a small proportion of the street network

334 miles or **8%**

of the total street network is on the updated **Active Transportation HIN.**

The HIN captures majority of the Bicycle and Pedestrian collisions

The 2024 Active Transportation HIN captures:

71% of Ped Collisions

68% of Bike Collisions

The HIN is overrepresented in EPCs and PDAs

18% of the total street network lies in an **EPC** vs. **49%** of the HIN

23% of the total street network lies in a **PDA** vs. **66%** of the HIN

THE 2024 PROACTIVE SAFETY NETWORK

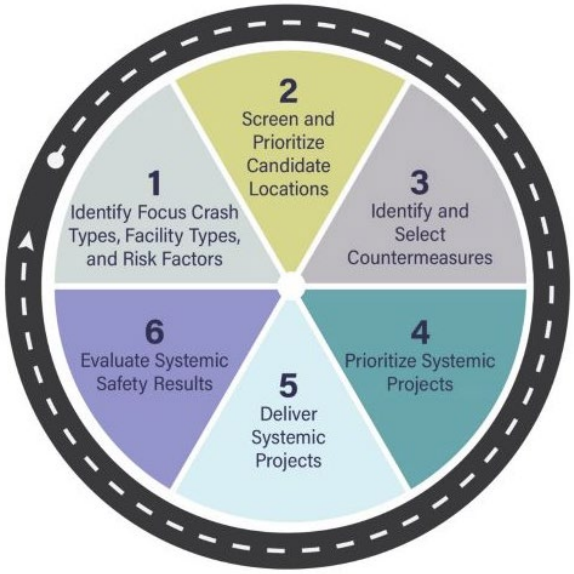
To complement the HIN, Alameda CTC developed a new 2024 Proactive Safety Network (PSN). The following sections provide an overview of the purpose, application, and methodology of the 2024 PSN. Maps and data included in this Report represent an initial concept PSN, as specific data may be refined throughout development of the 2026 CTP. This Report establishes the overall framework and methodology for the PSN.

Why Develop a PSN?

Consistent with the Safe System Approach, the 2024 PSN takes a proactive approach to safety analysis. The data-driven PSN represents a recent development in safety management strategies across the country. In August 2024, the FHWA released the Systemic Safety User Guide, which recommends screening and prioritizing candidate locations for systemic safety treatments based not only on crashes, but also on facility types and risk factors as one of the key initial steps in the process (**Figure 7**).

A proactive safety assessment overcomes some of the limitations of collision data used in HINs and identifies potential latent safety issues regardless of recent collision history. While the 2024 PSN is not a predictive tool, it can highlight segments where safety treatments would lower the likelihood of fatal or severe collisions.

Figure 7: Steps of the Systemic Safety User Guide



Source: FHWA

What is the PSN?

The PSN represents a network of streets where vulnerable users may be exposed to roadway conditions associated with fatal and severe injury collisions. Alameda CTC is developing this network for the first time in response to stakeholder feedback and based on the latest federal guidance (**Figure 7**).

This network aims to proactively identify segments with potential underlying opportunities to improve safety and prioritize safety enhancements before serious and fatal collisions occur.

Methodology

The 2024 PSN is based on a combination of inputs related to roadway characteristics that research has linked with higher likelihood of fatal and serious crashes, as well as where vulnerable user groups, such as students and people accessing transit, are likely to be walking, rolling or biking.

The 2024 PSN uses specific inputs for roadway characteristics and vulnerable users from data sources that are readily available, consistent for each jurisdiction, and are correlated with severe injury collisions based on existing research.

The data types, sources, and analysis methodology are detailed in the subsequent sections. Unlike the HIN, which is updated on a roughly 4-5 year schedule, Alameda CTC will continue to refine the initial concept PSN with jurisdiction partners throughout the 2026 CTP.

Roadway Characteristics

The roadway characteristics considered in development of the 2024 PSN consist of design features associated with fatal and severe injury collisions based on existing research.[6] These factors include:

1. High traffic volumes
2. High observed speeds
3. High number of travel lanes
4. Frequent intersections
5. Proximity to ramp terminals

Roadway Characteristic Thresholds

Alameda CTC reviewed modeled Average Daily Traffic (ADT) between the 60th and 80th percentiles and above the 80th percentiles to determine traffic volumes. To determine speed thresholds, Alameda CTC reviewed the maximum average speed over a 24-hour period where speeds were between 25 and 34 miles per hour or above 35 miles per hour. Roadways with a high number of vehicle lanes included roads with 4+ lanes. Roads with frequent intersections included roads 500 ft. or closer between intersections. These thresholds, their associated scores and the research justification behind the scores are summarized in **Table 7** in the Appendix.

Vulnerable User Data

The analysis also includes factors associated with vulnerable roadway users, such as:

1. Proximity to affordable housing locations
2. Proximity to transit stops
3. Proximity to schools
4. Alignment with major bike corridors

Vulnerable User Thresholds

Proximity to affordable housing locations, high and medium frequency transit stops, and schools were measured by a 10-minute walk shed. High frequency transit stops are defined as stops with up to 15-minute peak headways while medium-frequency stops are defined as stops with 15-30-minute headways. Data sources for the vulnerable user inputs are in **Table 7** in the Appendix.

Identifying the Proactive Safety Segments

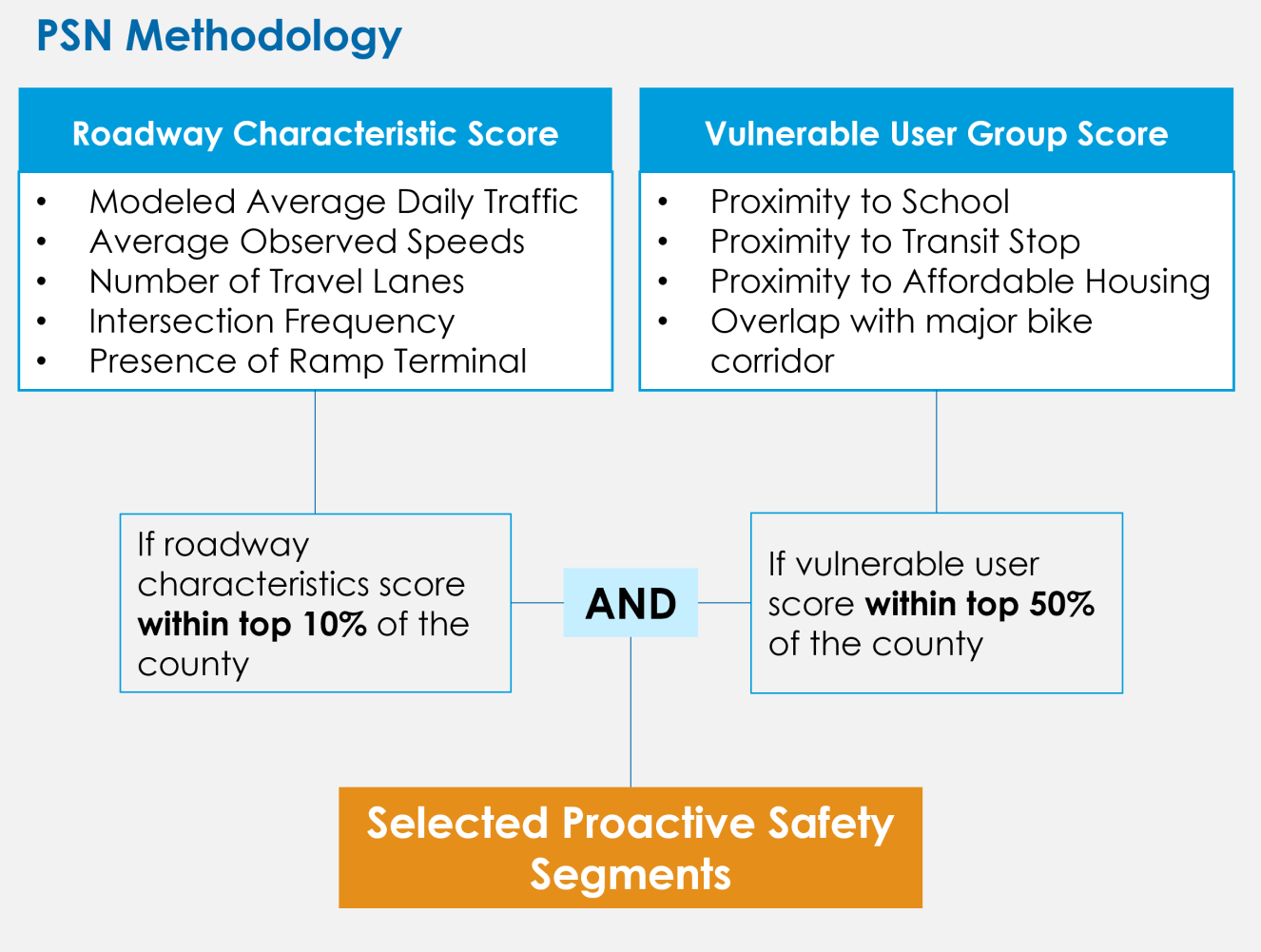
The 2024 PSN assesses each roadway segment against the five roadway characteristic factors and the four vulnerable user group factors then screens the network to select segments that meet *both* the criteria below:

1. Within the top 10% of roadway characteristic factors
2. Within the top 50% of vulnerable user factors

[6] Potential Risk Factors, FHWA https://safety.fhwa.dot.gov/systemic/pdf/FHWA_SystemicApproach_PotentialRiskFactors.pdf

Following the selection of the proactive safety segments based on the above criteria, segments are smoothed into continuous corridors to fill in small gaps between segments. The 2024 PSN methodology is summarized in **Figure 8** below.

Figure 8: 2024 PSN Methodology

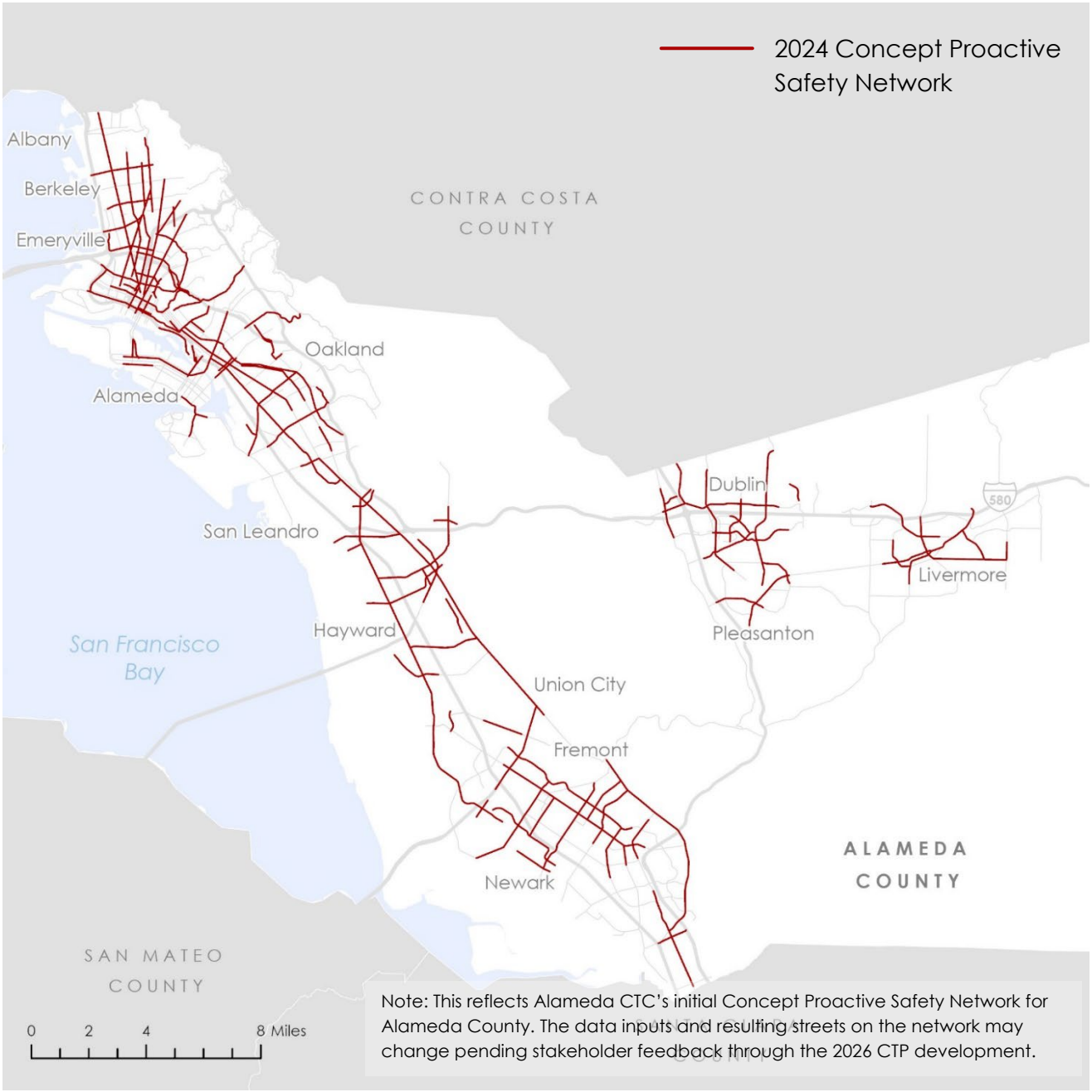


Source: Fehr & Peers, 2024

2024 PSN

The initial application of the 2024 PSN resulted in the map shown in **Figure 9**. The initial network will be refined with jurisdiction input through the CTP phase. In particular, where jurisdictions have more detailed data or updated roadway conditions Alameda CTC will work with those jurisdictions to update the PSN during the CTP process, therefore, the maps and data are considered a Concept PSN.

Figure 9: 2024 Concept Countywide Proactive Safety Network



Source: Fehr & Peers, 2024

2024 PSN Data Limitations

The methodology for the PSN relies on a range of big data sources, including the Alameda-Contra Costa Bi-County travel demand model (AlaCC Model), open-source mapping data, and data obtained via automatic vehicle location (AVL) systems or smartphones. While these datasets undergo individual quality control procedures, there are inherent limitations that can affect their ability to accurately incorporate local variations.

For example, estimated traffic volumes may differ from observed volumes collected through traffic counts. Travel demand models use a variety of data sources to model traffic conditions for various scenarios, and are calibrated and validated against high-level data sources that may be insensitive to extremely local conditions.

Speed data also presents a technical limitation in this analysis. The 2024 PSN uses observed speed data from INRIX, which provides the maximum average speed observed over a 24-hour period for the month of May 2024. In cases where INRIX data is incomplete, the travel demand model supplements this data with modeled speed values. Higher speeds result in more severe collisions when they occur. However, average speeds do not capture extreme speeding which produces some of the deadliest collisions. Consequently, the average speed data available may not fully capture reckless driver behavior.

Overall, the 2024 PSN combines multiple roadway factors to compensate for the potential limitations of any individual factor on a specific segment.

Unrelated to data sources, the 2024 PSN methodology uses roadway characteristics that may not include recent safety enhancements. Roads with high speeds and volumes can be rendered significantly safer by design interventions that separate vulnerable users. As a result, streets with high-quality active transportation infrastructure may still be included in the 2024 PSN, even if these improvements align with the Safe System Approach to enhance safety, because the countywide network is not always able to pick up this level of local detail.

Findings

The total length of the 2024 Concept PSN is 261 miles, which makes up approximately 6% of the total street network. The majority of the 2024 Concept PSN lies within the North and South Planning Areas. **Table 4** shows the distribution of the 2024 Concept PSN within the urbanized areas of the county.

Table 4: Distribution of the 2024 Concept PSN across the Planning Areas

Planning Area	% of Total Street Miles in Planning Area	% of 2024 Concept PSN
North	33%	43%
South	21%	22%
Central	19%	17%
East	17%	17%

Note: Approximately 10% of the total street network and 1% of the 2024 Concept PSN lies within non-urbanized areas.

Of the five roadway factors, four or more lanes (two or more per direction) is the most common factor contributing to high roadway scores across all Planning Areas, followed by

high traffic volumes. Higher vehicle speeds are a larger contributing factor in the South and East Planning Areas, whereas high intersection frequencies have a more significant contribution to high scores in the North and Central Planning Areas. North and Central Planning Areas also have a higher concentration of affordable housing locations than South and East Planning Areas.

Like the HIN, the 2024 Concept PSN is overrepresented in EPCs and PDAs. EPCs account for 35% of the 2024 Concept PSN while only making up 18% of the total street network, and PDAs account for 57% of the 2024 Concept PSN, while only making up 23% of the total street network. This underscores the need to proactively invest in safety improvements that serve low-income populations, people of color, transit riders, as well as areas slated for further development.

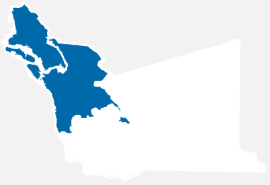
The 2024 Concept PSN accounts for a small proportion of the street network

261 miles or **6%**

of the total street network is on the **2024 Concept PSN.**

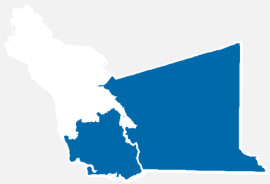
Ranking of roadway characteristics

North and Central Planning Areas:



1. 4+ lanes
2. High traffic volumes
3. Frequent intersections
4. High speeds
5. Ramp terminals

South and East Planning Areas:



1. 4+ lanes
2. High traffic volumes
3. High speeds
4. Frequent intersections
5. Ramp terminals

The 2024 Concept PSN is overrepresented in EPCs and PDAs

18% of the total street network lies in an **EPC** vs. **35%** of the 2024 Concept PSN

23% of the total street network lies in a **PDA** vs. **57%** of the 2024 Concept PSN

Comparison to the 2024 Active Transportation HIN

Compared to the Active Transportation HIN, the 2024 Concept PSN is about 74 miles smaller. This difference could be attributed to the fact that the HIN is a combination of the bicycle and pedestrian HINs, whereas the PSN is a single network that applies to all modes. The overlap between the HIN and 2024 PSN demonstrate a correlation between past collision history and roadway characteristic factors as 65% of the 2024 Concept PSN overlaps with the HIN, and 51% of the HIN overlaps with the 2024 Concept PSN. Of the total street network, 4% of streets lie on both the HIN and the 2024 Concept PSN and represent segments with the highest safety needs. **Figure 10** shows the countywide streets included in the 2019 and 2024 HINs and the 2024 Concept PSN, while **Figure 11** through **Figure 14** show these streets by Planning Area.

A small proportion of the street network falls within the "priority within priorities"

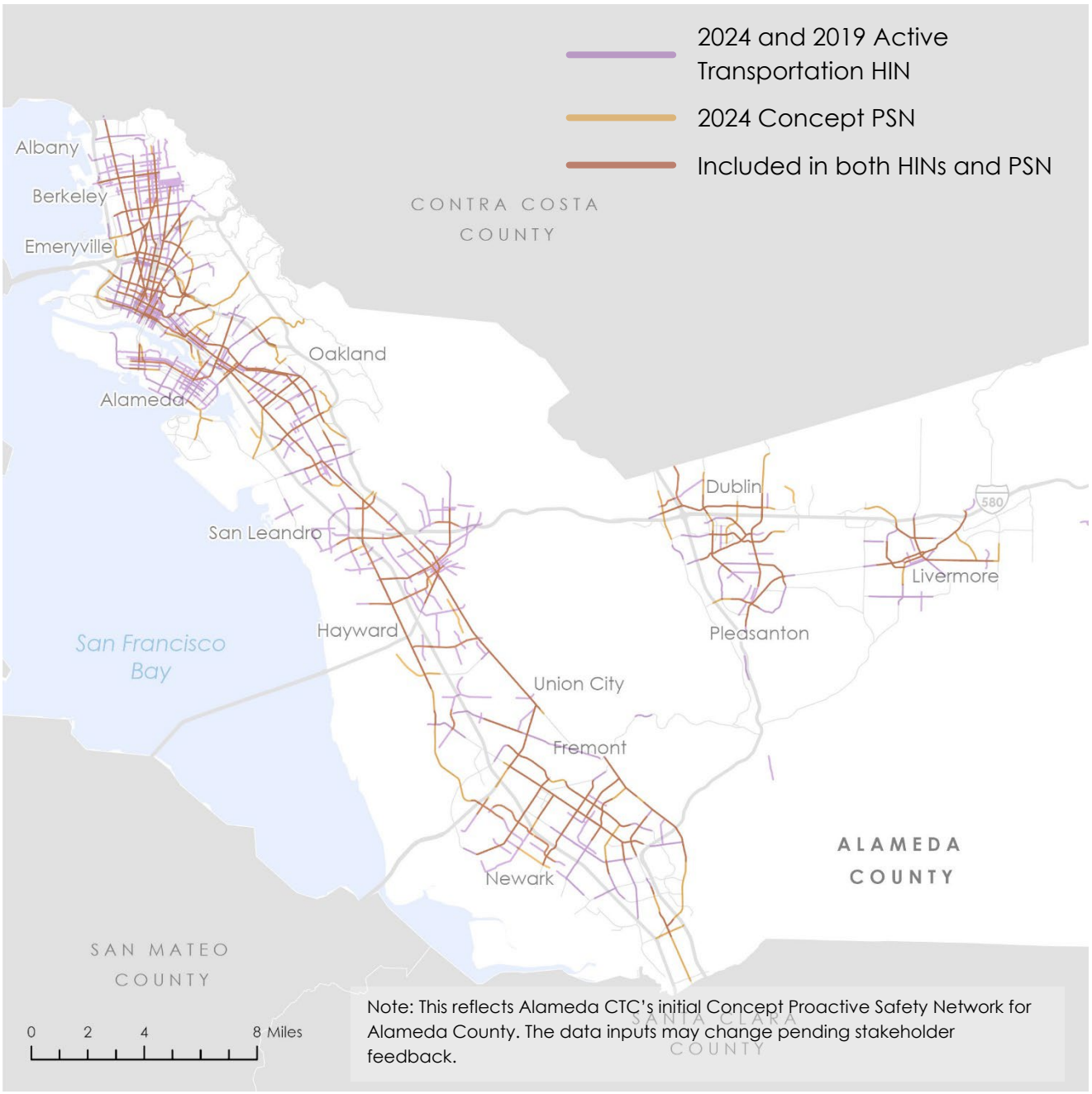
65% of the 2024 Concept PSN overlaps with the 2024 HIN

4% of the total street network lies on the 2024 Concept PSN **and** the 2024 HIN

Next Steps for the 2024 Concept PSN

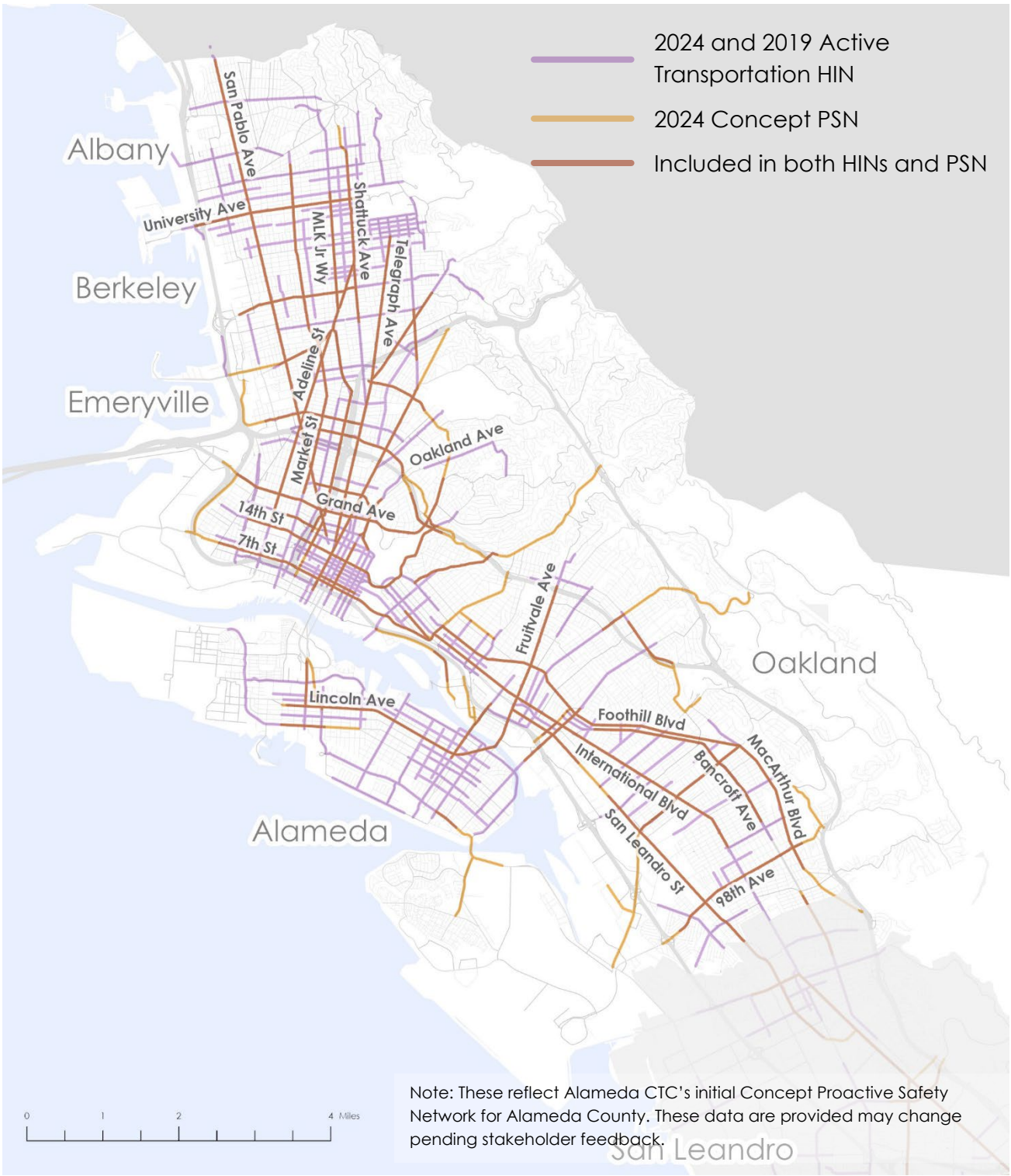
Given the benefits and limitations of the data and the methodology used for the 2024 PSN analysis, staff will continue working with jurisdictions to refine the PSN during the development of the 2026 CTP.

Figure 10: Streets Included in Both the HINs and 2024 Concept PSN



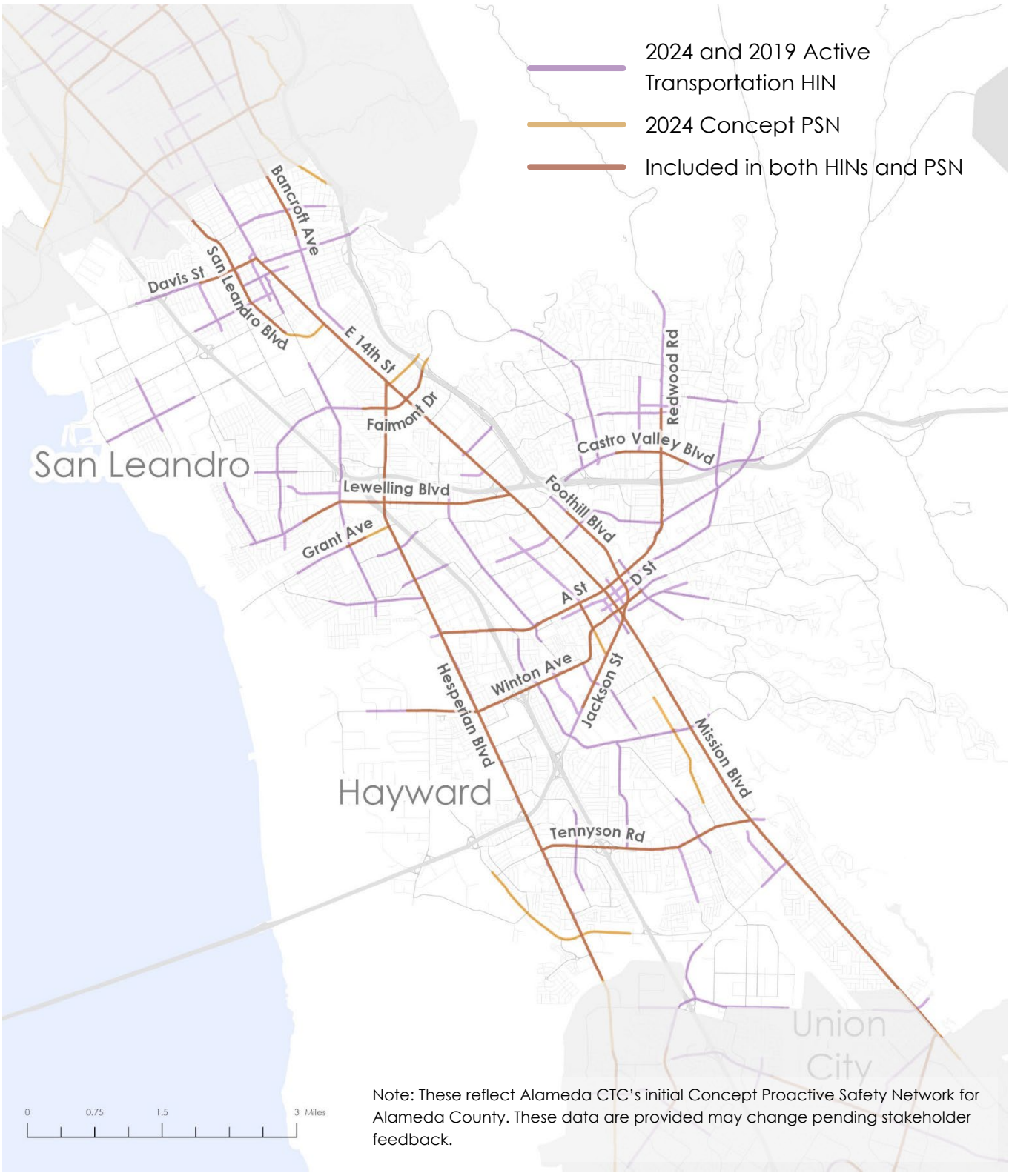
Source: Fehr & Peers, 2024

Figure 11: North Planning Area Streets Included in the HINs and 2024 Concept PSN



Source: Fehr & Peers, 2024

Figure 12: Central Planning Area Streets Included in the HINs and 2024 Concept PSN



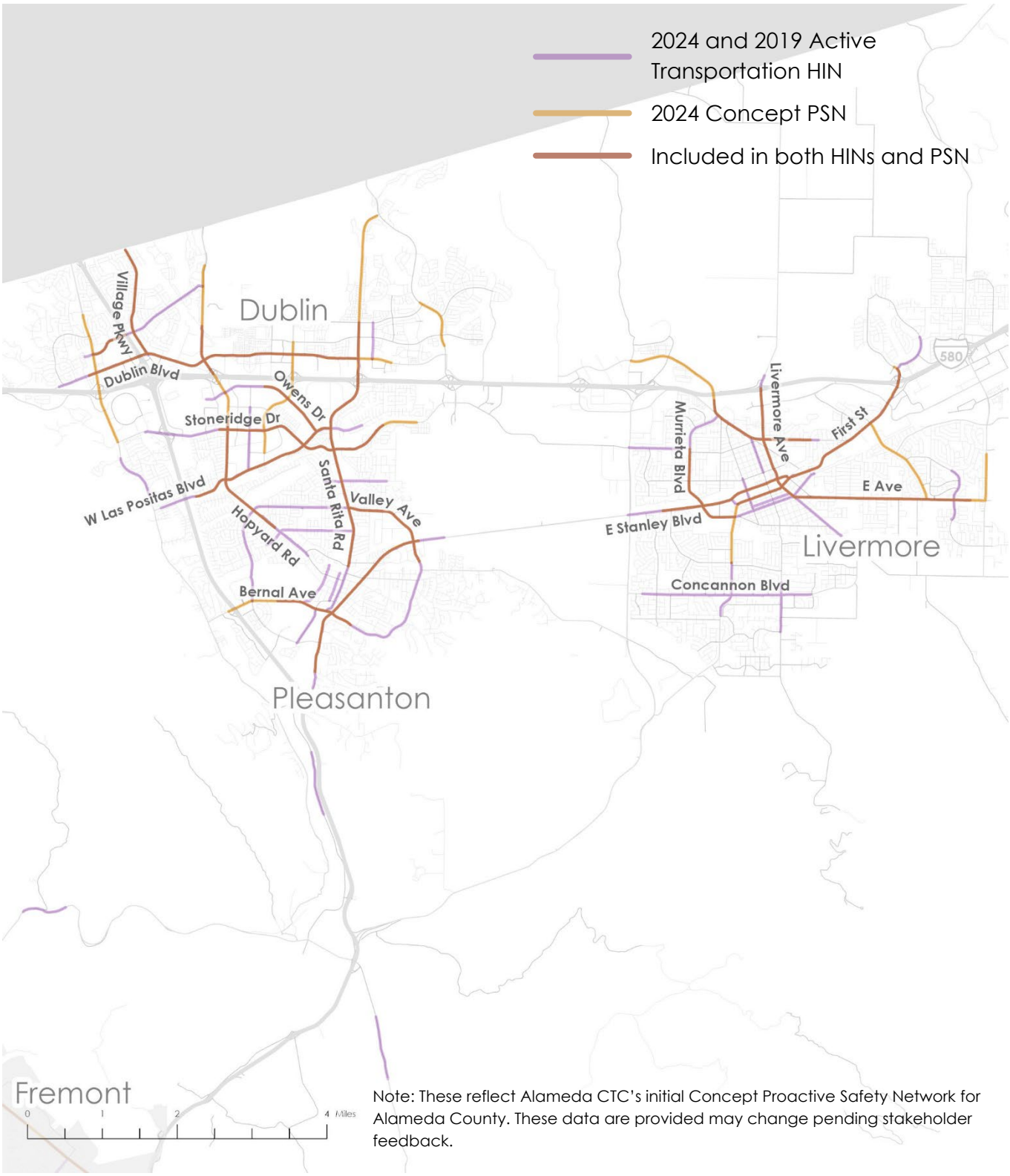
Note: These reflect Alameda CTC's initial Concept Proactive Safety Network for Alameda County. These data are provided may change pending stakeholder feedback.

Source: Fehr & Peers, 2024

Figure 13: South Planning Area Streets Included in the HINs and 2024 Concept PSN

Source: Fehr & Peers, 2024

Figure 14: East Planning Area Streets Included in the HINs and 2024 Concept PSN



Note: These reflect Alameda CTC's initial Concept Proactive Safety Network for Alameda County. These data are provided may change pending stakeholder feedback.

Source: Fehr & Peers, 2024

APPENDIX

2024 HIN Corridors

Table 5: List of Corridors on the 2024 HIN by Planning Area

Corridor Name	Jurisdiction(s)	Length (miles)
North Planning Area		
International Boulevard	Oakland	6.58
San Pablo Avenue	Albany, Berkeley, Emeryville, Oakland	6.36
Martin Luther King Junior Way	Berkeley, Oakland	5.33
Foothill Boulevard	Oakland	4.65
Telegraph Avenue	Berkeley, Oakland	4.44
MacArthur Boulevard	Oakland	4.01
Adeline Street	Berkeley, Emeryville, Oakland	4.15
Broadway	Alameda, Oakland	3.94
Bancroft Avenue	Oakland	3.61
San Leandro Street	Oakland	3.48
Shattuck Avenue	Berkeley, Oakland	3.33
Market Street	Oakland	3.05
Grand Avenue	Oakland	2.89
High Street	Alameda, Oakland	2.75
Fruitvale Avenue	Oakland	2.40
University Avenue	Berkeley	2.37
College Avenue	Berkeley, Oakland	2.29
Ashby Avenue	Berkeley	2.25
Channing Way	Berkeley	2.23

Corridor Name	Jurisdiction(s)	Length (miles)
Central Avenue	Alameda	2.00
14th Street	Oakland	1.95
Cedar Street	Berkeley	1.93
7th Street	Oakland	1.90
Webster Street	Alameda, Oakland	1.89
Solano Avenue	Albany, Berkeley	1.67
Claremont Avenue	Berkeley, Oakland	1.65
Park Street	Alameda	1.42
40th Street	Oakland	1.33
98th Avenue	Oakland	1.45
Shafter Avenue	Oakland	1.45
Buena Vista Avenue	Alameda	1.40
Santa Clara Avenue	Alameda	1.37
Gilman Street	Berkeley	1.35
Oak Street	Alameda, Oakland	1.34
Harrison Street	Oakland	1.33
35th Avenue	Oakland	1.25
Seminary Avenue	Oakland	1.25
Milvia Street	Berkeley	1.24
San Jose Avenue	Alameda	1.17
Sacramento Street	Berkeley	1.16
Lincoln Avenue	Alameda	1.15

Corridor Name	Jurisdiction(s)	Length (miles)
Sixth Street	Berkeley	1.13
Willow Street	Alameda	1.07
Shore Line Drive	Alameda	1.05
Lakeshore Avenue	Oakland	1.05
Parker Street	Berkeley	1.00
12th Street	Oakland	0.99
Frontage Road	Berkeley, Emeryville	0.97
Hearst Avenue	Berkeley	0.95
Encinal Avenue	Alameda	0.95
Bancroft Way	Berkeley	0.95
Grand Street	Alameda	0.95
Oakland Avenue	Piedmont	0.86
Mandela Parkway	Oakland	0.95
Stanford Avenue	Oakland	0.84
Clement Avenue	Alameda	0.92
73rd Avenue	Oakland	0.91
27th Street	Oakland	0.90
East 8th Street	Oakland	0.89
Atlantic Avenue	Alameda	0.86
Madison Street	Oakland	0.85
Allston Way	Berkeley	0.79
55th Street	Oakland	0.78
Oxford Street	Berkeley	0.77
18th Street	Oakland	0.75
5th Avenue	Oakland	0.75
Walnut Street	Alameda	0.75

Corridor Name	Jurisdiction(s)	Length (miles)
Jackson Street	Oakland	0.75
Otis Drive	Alameda	0.75
Brush Street	Oakland	0.75
69th Avenue	Oakland	0.75
82nd Avenue	Oakland	0.75
8th Street	Oakland	0.75
Alcatraz Avenue	Berkeley, Oakland	0.73
Addison Street	Berkeley	0.71
Castro Street	Oakland	0.70
Franklin Street	Oakland	0.69
Virginia Street	Berkeley	0.69
29th Avenue	Oakland	0.66
Delaware Street	Berkeley	0.66
10th Street	Oakland	0.65
Hollis Street	Emeryville	0.63
55th Avenue	Oakland	0.65
19th Street	Oakland	0.65
Oregon Street	Berkeley	0.65
Piedmont Avenue	Oakland	0.65
36th Street	Oakland	0.64
51st Street	Oakland	0.63
13th Street	Oakland	0.59
11th Street	Oakland	0.55
105th Avenue	Oakland	0.55
17th Street	Oakland	0.55
90th Avenue	Oakland	0.54

Corridor Name	Jurisdiction(s)	Length (miles)
Sherman Street	Alameda	0.51
Lakeside Drive	Oakland	0.50
Ninth Street	Berkeley	0.50
8th Avenue	Oakland	0.50
Thomas L. Berkley Way	Oakland	0.49
East 18th Street	Oakland	0.49
California Street	Berkeley	0.49
Tilden Way	Alameda	0.47
East 10th Street	Oakland	0.46
Rose Street	Berkeley	0.45
Embarcadero	Oakland	0.45
23rd Street	Oakland	0.45
94th Avenue	Oakland	0.45
Hegenberger Road	Oakland	0.45
West Street	Oakland	0.45
Park Boulevard	Oakland	0.44
9th Street	Oakland	0.43
Church Street	Oakland	0.42
Durant Avenue	Berkeley	0.38
Center Street	Berkeley	0.38
D Street	Oakland	0.38
Bond Street	Oakland	0.38
B Street	Oakland	0.37
Jefferson Street	Oakland	0.35
Dwight Way	Berkeley	0.35
Blanding Avenue	Alameda	0.35
Tunnel Road	Berkeley	0.35
The Alameda	Berkeley	0.35
Euclid Avenue	Berkeley	0.35
Marin Avenue	Berkeley	0.34
Ward Street	Berkeley	0.33
23rd Avenue	Oakland	0.33
48th Avenue	Oakland	0.30
Fairfax Avenue	Oakland	0.30
14th Avenue	Oakland	0.26
Ellsworth Street	Berkeley	0.25
34th Avenue	Oakland	0.25
Hillegass Avenue	Berkeley	0.25
Fulton Street	Berkeley	0.25
Warring Street	Berkeley	0.25
22nd Avenue	Oakland	0.25
Central Planning Area		
Mission Boulevard	Ashland, Cherryland, Hayward	7.17
Hesperian Boulevard	Ashland, Hayward, San Leandro, San Lorenzo	6.21
East 14th Street	Ashland, San Leandro	4.58
Lewelling Boulevard	Ashland, San Leandro	3.02
A Street	Castro Valley, Hayward	2.73
Redwood Road	Castro Valley	2.67
Winton Avenue	Hayward	2.63

Corridor Name	Jurisdiction(s)	Length (miles)
Tennyson Road	Hayward	2.56
Grove Way	Castro Valley	1.95
Castro Valley Boulevard	Castro Valley	2.35
Washington Avenue	San Leandro, San Lorenzo	2.13
Meekland Avenue	Cherryland	1.62
Bancroft Avenue	San Leandro	2.02
B Street	Hayward	1.70
Foothill Boulevard	Hayward	1.42
Jackson Street	Hayward	1.50
D Street	Hayward	1.35
Farnsworth Street	San Leandro	1.35
Harder Road	Hayward	1.25
San Leandro Boulevard	San Leandro	1.25
Whipple Road	Hayward	1.20
Center Street	Castro Valley	1.00
Estudillo Avenue	San Leandro	1.15
Western Boulevard	Cherryland, Hayward	1.06
Bockman Road	San Lorenzo	1.05
Davis Street	San Leandro	1.05
Lake Chabot Road	Castro Valley	0.99
Second Street	Hayward	0.86
Via Alamitos	San Lorenzo	0.85
Grant Avenue	San Lorenzo	0.85
Fairway Drive	San Leandro	0.81
Dutton Avenue	San Leandro	0.75

Corridor Name	Jurisdiction(s)	Length (miles)
Amador Street	Hayward	0.68
Ruus Road	Hayward	0.65
Santa Maria Avenue	Castro Valley	0.65
Doolittle Drive	San Leandro	0.65
Halcyon Drive	San Leandro	0.62
Blossom Way	Cherryland	0.55
Hacienda Avenue	San Lorenzo	0.55
Juana Avenue	San Leandro	0.55
Heyer Avenue	Castro Valley	0.55
Gading Road	Hayward	0.55
Paseo Grande	San Lorenzo	0.53
Crow Canyon Road	Castro Valley	0.47
Watkins Street	Hayward	0.47
164th Avenue	Ashland	0.45
Santa Clara Street	Hayward	0.45
Fairmont Drive	San Leandro	0.26
Main Street	Hayward	0.35
Floresta Boulevard	San Leandro	0.35
Grand Street	Hayward	0.32
Elgin Street	Ashland	0.27
South Planning Area		
Fremont Boulevard	Fremont	7.18
Paseo Padre Parkway	Fremont	4.90
Mowry Avenue	Fremont, Newark	3.67
Thornton Avenue	Fremont, Newark	3.66
Alvarado-Niles Road	Union City	3.63

Corridor Name	Jurisdiction(s)	Length (miles)
Cedar Boulevard	Newark	3.40
Mission Boulevard	Fremont, Union City	3.17
Blacow Road	Fremont	2.95
Central Avenue	Fremont, Newark	2.60
Stevenson Boulevard	Fremont	2.45
Decoto Road	Fremont, Union City	2.35
Dyer Street	Union City	1.95
Niles Boulevard	Fremont	1.86
Newark Boulevard	Newark	1.75
Sundale Drive	Fremont	1.45
Grimmer Boulevard	Fremont	1.23
Driscoll Road	Fremont	1.15
Palm Avenue	Fremont	0.97
Jarvis Avenue	Newark	0.85
Boyce Road	Fremont	0.85
Warm Springs Boulevard	Fremont	0.75
Alvarado Boulevard	Union City	0.65
Cherry Street	Newark	0.54
Willow Street	Newark	0.46
Medallion Drive	Union City	0.34
East Planning Area		
Bernal Avenue	Pleasanton	2.87
West Las Positas Boulevard	Pleasanton	2.75
Santa Rita Road	Pleasanton	2.51
Stoneridge Drive	Pleasanton	2.45
Valley Avenue	Pleasanton	2.38
East Avenue	Livermore	2.35
Hopyard Road	Pleasanton	2.31
Concannon Boulevard	Livermore	2.25
Dublin Boulevard	Dublin	2.15
Murrieta Boulevard	Livermore	2.00
First Street	Livermore	1.95
Portola Avenue	Livermore	1.65
Livermore Avenue	Livermore	1.63
Amador Valley Boulevard	Dublin	1.55
East Stanley Boulevard	Livermore	1.38
Owens Drive	Pleasanton	1.30
Black Avenue	Pleasanton	1.25
Fourth Street	Livermore	1.25
Village Parkway	Dublin	0.98
Mohr Avenue	Pleasanton	0.85
Foothill Road	Pleasanton	0.65
Main Street	Pleasanton	0.59
Willow Road	Pleasanton	0.55
Third Street	Livermore	0.53
Railroad Avenue	Livermore	0.52
Pleasanton Sunol Road	Sunol	0.45
P Street	Livermore	0.45
Calaveras Road	Sunol	0.33

2024 Concept PSN Corridors

Table 6: List of Corridors on the 2024 Concept PSN by Planning Area

Corridor Name	Jurisdiction(s)	Length (miles)
North Planning Area		
MacArthur Boulevard	Oakland	7.77
San Pablo Avenue	Emeryville, Albany, Oakland, Berkeley	6.42
Martin Luther King Junior Way	Berkeley, Oakland	4.88
International Boulevard	Oakland	4.82
Foothill Boulevard	Oakland	4.44
San Leandro Street	Oakland	4.33
Grand Avenue	Piedmont, Oakland	4.26
Telegraph Avenue	Berkeley, Oakland	4.08
Broadway	Oakland	3.87
Adeline Street	Emeryville, Berkeley, Oakland	3.47
Park Boulevard	Piedmont, Oakland	3.11
Bancroft Avenue	Oakland	2.92
7th Street	Oakland	2.66
98th Avenue	Oakland	2.66
Hegenberger Road	Oakland	2.52
Lincoln Avenue	Alameda	2.41
Market Street	Oakland	2.26
Fruitvale Avenue	Oakland	2.20
Shattuck Avenue	Berkeley	2.01
University Avenue	Berkeley	2.19
Sacramento Street	Berkeley	2.15
14th Street	Oakland	1.70
Ashby Avenue	Berkeley	1.59
Embarcadero	Oakland	1.55
Redwood Road	Oakland	1.54
Claremont Avenue	Berkeley, Oakland	1.38
40th Street	Emeryville, Oakland	1.30
Harrison Street	Oakland	1.25
14th Avenue	Oakland	1.20
73rd Avenue	Oakland	1.07
Central Avenue	Alameda	1.02
Frontage Road	Oakland	1.01
High Street	Oakland	1.00
Lakeshore Avenue	Oakland	0.97
35th Avenue	Oakland	0.93
27th Street	Oakland	0.90
East 8th Street	Oakland	0.89
Shellmound Street	Oakland, Emeryville	0.87
Stanford Avenue	Oakland	0.74
Island Drive	Alameda	0.82
Santa Clara Avenue	Oakland	0.71
Webster Street	Alameda	0.62
Powell Street	Emeryville	0.61
Golf Links Road	Oakland	0.70

Corridor Name	Jurisdiction(s)	Length (miles)
Constitution Way	Alameda	0.68
College Avenue	Oakland	0.63
Otis Drive	Alameda	0.64
51st Street	Oakland	0.63
Pleasant Valley Avenue	Oakland	0.63
East 21st Street	Oakland	0.58
Tilden Way	Alameda	0.57
18th Street	Oakland	0.52
Edgewater Drive	Oakland	0.51
8th Street	Oakland	0.51
East 12th Street	Oakland	0.50
Kennedy Street	Oakland	0.50
Lake Park Avenue	Oakland	0.48
Park Street	Alameda	0.44
Doolittle Drive	Alameda	0.43
Lake Merritt Boulevard	Oakland	0.38
29th Avenue	Oakland	0.36
Castro Street	Oakland	0.28
42nd Avenue	Oakland	0.26
Central Planning Area		
Hesperian Boulevard	Ashland, San Leandro, San Lorenzo, Hayward	7.24
Mission Boulevard	Ashland, Cherryland, Hayward	7.17
East 14th Street	Ashland, San Leandro	3.78
A Street	Castro Valley, Hayward	2.88
Tennyson Road	Hayward	2.41
Lewelling Boulevard	San Leandro, Ashland	2.37
Winton Avenue	Hayward	2.20
San Leandro Boulevard	San Leandro	2.16
Foothill Boulevard	Hayward	1.41
Redwood Road	Castro Valley	1.35
Industrial Boulevard	Hayward	1.32
Whitman Street	Hayward	1.31
Jackson Street	Hayward	1.18
D Street	Hayward	1.02
Castro Valley Boulevard	Castro Valley	0.82
Fairmont Drive	San Leandro, Ashland	0.67
Bancroft Avenue	San Leandro	0.73
Davis Street	San Leandro	0.68
Grand Street	Hayward	0.63
Industrial Parkway West	Hayward	0.54
Grant Avenue	San Lorenzo	0.52
150th Avenue	Ashland	0.39
MacArthur Boulevard	San Leandro	0.42
Halcyon Drive	San Leandro	0.26

Corridor Name	Jurisdiction(s)	Length (miles)
South Planning Area		
Mission Boulevard	Union City, Fremont	8.36
Fremont Boulevard	Fremont	5.74
Paseo Padre Parkway	Fremont	5.45
Thornton Avenue	Fremont, Newark	3.82
Mowry Avenue	Newark, Fremont	3.54
Union City Boulevard	Union City	3.35
Cedar Boulevard	Newark	3.32
Decoto Road	Fremont, Union City	3.27
Warm Springs Boulevard	Fremont	3.25
Stevenson Boulevard	Fremont	2.39
Grimmer Boulevard	Fremont	1.90
Walnut Avenue	Fremont	1.82
Central Avenue	Fremont	1.41
Ardenwood Boulevard	Fremont	1.47
Alvarado-Niles Road	Union City	1.41
Cherry Street	Newark	1.34
Warren Avenue	Fremont	1.08
Driscoll Road	Fremont	1.06
Newark Boulevard	Newark	0.98
Osgood Road	Fremont	0.86
Dyer Street	Union City	0.75
Washington Boulevard	Fremont	0.74
Jarvis Avenue	Newark	0.70

Corridor Name	Jurisdiction(s)	Length (miles)
East Planning Area		
Dublin Boulevard	Dublin	4.16
Stoneridge Drive	Pleasanton	2.91
First Street	Livermore	2.78
Santa Rita Road	Pleasanton	2.71
East Avenue	Livermore	2.55
Portola Avenue	Livermore	2.46
Hopyard Road	Pleasanton	2.40
Tassajara Road	Dublin	2.20
West Las Positas Boulevard	Pleasanton	2.08
Bernal Avenue	Pleasanton	2.02
Hacienda Drive	Dublin, Pleasanton	1.66
Dougherty Road	Dublin	1.49
Village Parkway	Dublin	1.49
Livermore Avenue	Livermore	1.45
Murrieta Boulevard	Livermore	1.33
North Mines Road	Livermore	1.31
Valley Avenue	Pleasanton	1.09
San Ramon Road	Dublin	0.90
Owens Drive	Pleasanton	0.95
East Stanley Boulevard	Livermore	0.93
1st Street	Pleasanton	0.88
Sunol Boulevard	Pleasanton	0.84
Railroad Avenue	Livermore	0.80
Holmes Street	Livermore	0.79
Fallon Road	Dublin	0.73

Corridor Name	Jurisdiction(s)	Length (miles)
Foothill Road	Pleasanton	0.71
Stanley Boulevard	Pleasanton	0.67
Vasco Road	Livermore	0.62
Amador Valley Boulevard	Dublin	0.50
Springtown Boulevard	Livermore	0.27

2024 PSN Data Inputs and Scoring

Table 7: 2024 Proactive Safety Network Inputs and Scoring Application

2024 PSN Inputs	Score Application	Justification
Roadway (Possible Points = 8)		
Modeled Average Daily Traffic (ADT)[1]	≥80th Percentile = 2 pts 60th – 80th Percentile = 1 pt <60th Percentile = 0 pts	▪ High vehicle volumes elevate the likelihood of pedestrian crashes due to increased exposure at conflict points between roadway users.[a]
Observed Speed (Max average speed over 24-hour period)[2]	≥35 mph = 2 pts 25 – 34 mph = 1 pts <25 mph = 0 pts	▪ Average risk of a pedestrian fatality increases as speed increases.[b] ▪ According to the FHWA Safe System Project-Based Alignment Framework's Risk Factor Scoring thresholds, roadways with operating speeds over 35mph are scored 4 times higher than roadways with operating speeds between 21-25mph.[c]
Number of Vehicle Lanes in Both Directions[1]	≥4 lanes = 2 pts <4 lanes = 0 pts	▪ Pedestrians/bicyclists are exposed to oncoming traffic for longer times/distances while crossing multiple lanes, which increases the chance of crashes.[d] ▪ Based on FHWA's Proven Safety Countermeasures Toolbox, a 4-lane to 3-lane road diet conversion can result in 19-47% reduction in total crashes.[e]
Intersection frequency (distance between intersections along a corridor)[3]	≤ 500 ft segment = 1 pts > 500 ft segment = 0 pts	▪ Higher intersection/driveway frequency increases the number of conflict points, such as a vehicle pulling into/out of a driveway or a vehicle crossing a crosswalk at an intersection to make a turn.[f] ▪ Based on FHWA's Proven Safety Countermeasures Toolbox, reducing driveway density can result in 25-31% reduction in fatal and injury crashes along urban/suburban arterials.[g]
Presence of Ramp Terminal[3]	Yes = 1 pts No = 0 pts	Roadway segments that include freeway on- or off-ramps typically have higher observed speeds than the rest of the corridor and include more conflict points due to merging traffic.

2024 PSN Inputs	Score Application	Justification
Vulnerable Users (Possible Points = 4)		
Proximity to schools[4]	Segments with ≥250 ft within 10-min walk shed Yes = 1 pt No = 0 pts	Roadway segments near schools likely have a higher proportion of children walking or biking on them.
Presence of transit stop (bus, ferry, and rail)[5]	Segments with ≥250 ft within 10-min walk shed of: ▪ High-frequency stops (≤15 min peak period headways) = 2 pts ▪ Medium-frequency stops (15 – 30 min peak period headways) = 1 pt ▪ All other stops = 0 pts	Roadway segments near transit stops are likely to have a higher proportion of vulnerable roadway users such as pedestrians and bicyclists, since those are likely the most common modes for first-mile/last-mile connectivity.
Proximity to affordable housing[6]	Segments with ≥250 ft within 10-min walk shed Yes = 1 pt No = 0 pts	Roadway segments near affordable housing likely serve a higher proportion of low-income populations who also tend to be older adults and people with disabilities.
Overlap with major bike corridors[7]	Segments overlapping major bike corridors Yes = 1 pt No = 0 pts	Roadway segments that lie on major regional bikeway corridors would likely have higher number of vulnerable users such as bicyclists and pedestrians.

Data Sources:

1. Alameda Contra Costa Bi County Model (AlaCC) Travel Demand Model. The AlaCC is a regional activity-based model (ABM) derived from MTC's Travel Model 1.5 (TM 1.5) and is validated against pre-COVID 2020 data.
2. INRIX, May 2024. Posted speed data from the AlaCC Model was used to supplement INRIX data where observed speeds were missing.
3. AlaCC Model.
4. California Department of Education, 2024.
5. General Transit Feed Specification (GTFS), May 2024.
6. California Housing Partnership: Privately Owned Subsidized Housing, 2021; California Department of Housing and Community Development: Public Housing, 2021.
7. Alameda CTC's Countywide Bikeways Network.

Justification Sources:

a. Potential Risk Factors, FHWA https://safety.fhwa.dot.gov/systemic/pdf/FHWA_SystemicApproach_PotentialRiskFactors.pdf
b. Federal Highway Administration, https://highways.dot.gov/public-roads/winter-2022/05
c. Safe System Project-based Alignment Framework, FHWA
d. NCHRP Report 893: Systemic Pedestrian Safety Analysis, NCHRP (2018)
e. FHWA Proven Safety Countermeasures Initiative (PSCi), FHWA, https://highways.dot.gov/safety/proven-safety-countermeasures/road-diets-roadway-reconfiguration
f. NCHRP Report 893: Systemic Pedestrian Safety Analysis, NCHRP (2018)
g. FHWA Proven Safety Countermeasures Initiative (PSCi), FHWA, https://highways.dot.gov/safety/proven-safety-countermeasures/corridor-access-management