Mountain View
Active Transportation Plan

Existing Conditions and Needs Summary

October 2023 DRAFT

City of Mountain View

ACTIVE TRANSPORTATION PLAN

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INTRODUCTION

What is the Active Transportation Plan?

Mountain View envisions an active transportation network that is safe and comfortable for all users regardless of age, ability, income, race or language. The Mountain View Active Transportation Plan (ATP) aims to identify citywide policies and projects that will improve walking, biking, rolling, and green streets in Mountain View. The ATP will address a range of factors that affect safety and comfort for people who walk, bike and roll, including roadway and sidewalk paving conditions, sidewalk design, bikeway design, lighting, sight lines, vehicle travel speeds, exposure to moving vehicles, street trees, stormwater management and other environmental factors. The ATP is guided by a vision statement and five planning principles that encapsulate the top priorities for the project:

Vision Statement: *The City of Mountain View will lead regionally by creating an active transportation system that strengthens the community's access to housing, employment, schools and other destinations.*

The Active Transportation Plan will enable the City to intentionally plan with policies that support walkable and bikeable places, programs that create a culture of walking and biking, and projects that produce a connected, low-stress and inviting active transportation network that doubles as corridors of shade, habitat and public open space. This network of streets and trails will encourage biking and walking, enhance biodiversity and reduce climate change impacts.

What is the Existing Conditions and Needs Summary?

The Existing Conditions and Needs Summary is one of the first steps in the development of the ATP. The Summary describes key aspects of infrastructure, services, demographics, and other community characteristics that influence walking, biking, and green streets in Mountain View today.

What Data Sources are Reflected in the Summary?

The maps and images in this summary reflect citywide datasets—such as census data and public safety records—and input and observations collected directly from community members through a series of public engagement activities during the spring and summer of 2023. The various data sources are summarized below.

Secondary data

Data was provided from the City of Mountain View's open data portal related to physical infrastructure (e.g., street centerlines, sidewalks, crosswalks, bicycle facilities, posted speeds), existing land uses, tree canopy, stormwater, current and planned projects, MV Shuttle and public safety records. Community demographics were collected from the U.S. Census American Community Survey (ACS) 5-year estimates. Historical crash data was downloaded from the Transportation Injury Mapping System (TIMS), which is a geodatabase of all police-reported crashes in California, from the California Statewide Integrated Traffic Records System developed by the Safe Transportation Research and Education Center (SafeTREC) at the University of California, Berkeley. The Santa Clara Valley Transportation Authority (VTA) provided data on fixed-route bus stops, routes and ridership.

Community Engagement data

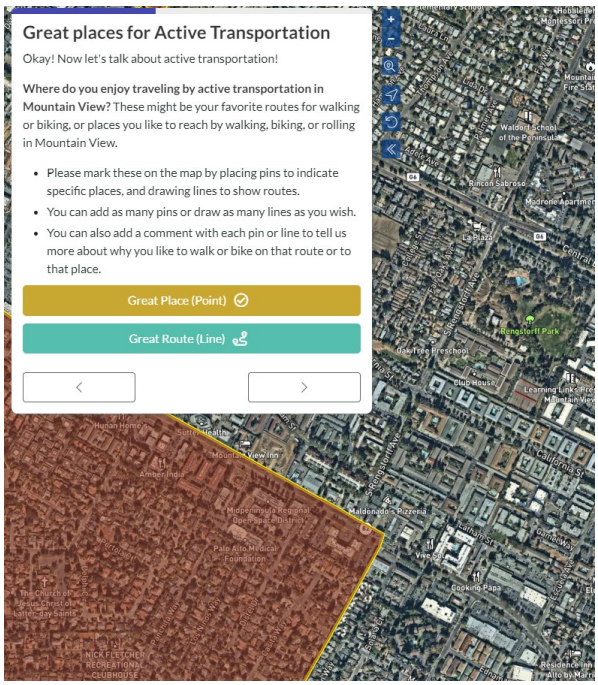
Community input is an important data source to understand the existing conditions, which are not only about what is physically on the ground or in a policy but also how it is experienced by those who travel. The ATP deployed a multi-pronged approach to engagement during the existing conditions phase of the project, recognizing that people vary in their comfort or preference for providing input. A mix of digital, print and in-person opportunities at various times and with interpretation helped to make engagement open and inclusive.

ATP Survey:

An online mapping survey was developed in the spring of 2023 using a survey platform called Maptionnaire. The survey asked participants a series of questions about their experiences walking and rolling in Mountain View—their favorite places and routes, their challenging spots and routes and what and where they would like to see improvements. Participants were asked to digitally record their answers on maps of the city of Mountain View and to share any additional comments. Sociodemographic information was optional.

The survey, available in English, Spanish, Chinese and Russian, was open for public participation from May 15 – July 31, 2023. It was promoted via postcards, flyers and lawn signs distributed around Mountain View, digital social media promotions and email blasts. Six hundred fifty-five people participated in the survey.

The ATP Survey was promoted in four languages using print and digital communications.



Sample page from the ATP Survey.

In-person meetings/presentations:

In-person meetings were held at the Community Services Agency (CSA) and the Day Worker Center (DWC), leveraging members of the Active Transportation Plan Advisory Committee (ATPAC) to connect with communities that often do not participate as frequently in engagement activities in Mountain View. Spanish interpretation was provided for the meetings. The meetings focused on gathering input on meeting participants' experiences walking and rolling in Mountain View. City staff also tabled at the Senior Center and conducted an ATP workshop to understand senior's experiences traveling in Mountain View. Lastly, a teen-focused meeting was held during an existing bicycle-themed event, but attendance was low.

Bike Tours:

Two bike tours were held on May 13 and September 23, 2023, with the consulting team and city staff to experience bicycling in Mountain View. Approximately 40 adults and three children participated in the three-hour,11-mile bike tours, which focused on high-stress known trouble areas and critical connection points within the bicycling network.

Walk Tours:

Three walk tours were held in August 2023. Walk tour routes were determined based on prior community meetings, secondary data on key destinations and demographics, and initial

Maptionnaire findings (Table 1). The purpose of the walk tours was to hear about what is working and not working for people who walk in Mountain View. A park, school and area known to have more seniors were intentionally selected to understand the walking experience of more vulnerable travelers.

Table 1 Walk Tour Details

Location	Date	Route	Attendees
Rengstorff Park	August 11, 2023, 6:00-7:30 pm	Rengstorff—Latham—Paseo—El Camino Real—Rengstorff	27
Mistral Elementary	August 12, 2023, 9:30-11:00 am	Escuela—California—Rengstorff—Latham	10
Sylvan Ave	August 25, 2023, 5:30-7:00 pm	Sylvan—Glenborough—Moorpark	22

AskMV:

The City of Mountain View maintains an online comment platform called AskMV, where individuals can share on a variety of topics. City staff monitor the platform for comments related to walking and bicycling experiences, recommended improvements and transportation safety.

BPAC:

The Bicycle and Pedestrian Advisory Committee (BPAC) is appointed by the City Council to represent the interests of people who walk and bike in the city. City staff present on pedestrian and bicycle topics, including upcoming projects, plans, and policy changes. The project team presented to BPAC in February 2023, and several BPAC members participated in the Bike and Walk Tours.

ATPAC:

The Active Transportation Plan Advisory Committee (ATPAC) was formed to have an external advisory group that can provide input to the ATP as it is developed and act as a liaison for their networks. Members represent non-profit organizations and public agencies that work in active transportation, green streets or serve the needs of those that walk and roll, such as but not limited to, the Community Services Agency, Santa Clara Public Health Department, VTA, the Day Worker Center, MV Mobile Home Alliance, Youth Advisory Committee, Mountain View Los Altos High School District, Silicon Valley Bicycle Coalition, and Mountain View Chamber of Commerce. ATPAC members helped organize and participate in many of the engagement activities.

Background Review

The Background Review is part of Task 2 in the project's overall scope of work. The task involved the review of various plans & documents at the state, regional and local level to understand existing condition mapping, supporting/contradicting goals and policies, measures, design/sectional standards with local examples, top-tiered identified or proposed projects, etc. This effort was separate from the Existing Conditions task, but the understanding gained from that work informed the observations and conclusions noted in this document. Relevant background materials include but are not limited to:

- Transit Center Master Plan, 2017
- The Community Tree Master Plan, 2015
- AccessMV Comprehensive Modal Plan, 2020
- Castro Pedestrian Mall Feasibility Study
- Vision Zero Action Plan and Local Road Safety Plan (in progress)
- General Plan 2030 and Various Precise Plans

Combined, these sources of information provide a baseline understanding of the opportunities and challenges to improve active transportation and green streets in Mountain View. This baseline understanding will help identify potential projects and policies to be developed, studied, and refined in later phases of the project.

Code Review

A code review was also performed as part of Task 2—Background Review to review existing City documents that set policy and criteria that determine the final form of the built environment. The Code Review included:

- 2002 Standard Design Criteria (SDC)
- 2019 Standard Provisions and Standard Details (SP&D)
- Mountain View City Code

Code Review Findings

Throughout this document, key findings from the review of existing code are highlighted in blue boxes like this one. During future project phases, code recommendations will be developed based on a full analysis of existing conditions, data, and best practices. These recommendations will be included in the final plan.

How is the Summary Structured?

The Existing Conditions and Needs Summary begins with an overview of community demographics and mode share in Mountain View and then uses four of the guiding principles identified for the future of active transportation in Mountain View to understand current conditions for active transportation:

- Mobility & Connectivity
- Safety & Comfort
- Access & Equity
- Sustainability & Biodiversity

Observations and analysis of the data described in the previous section are provided, with each section concluding with key takeaways or findings.

1. DEMOGRAPHICS AND MODE SHARE

Demographics

The City of Mountain View is a Santa Clara County community that experiences the opportunities and challenges of a strong Bay Area economy. Based on the 2020 U.S. Decennial Census, the city's population is approximately 82,000, an increase of over 10% since 2010. Additionally, the influx of professionals to public and private employers increases the city population by over 100,000 during most weekdays. Approximately 55 percent of the population identifies as male and 45 percent as female. The city is relatively young, with almost 67 percent of its population under 44 (median age 35.3 years) and approximately 22% under the age of 18 (U.S. Census 2021 American Community Survey [ACS] 5-year estimates)—a demographic for which a robust and safe active transportation network provides an opportunity for independent mobility (Table 2).

Table 2 Mountain View Age Demographics

Age	Number	Percent
Under 5	5238	6.4
5 to 14 years	9,113	11.1
15 to 19 years	3,720	4.5
20 to 24 years	4,343	5.3
25 to 44 years	32,655	39.6
45 to 64 years	18,192	22.1
65 to 79 years	6,624	8.0
80 and over	2,524	3.1
Total	82,409	100.0

ACS 2021 5-year estimates

Mountain View's overall population density is low to medium, with some areas in the central west portion of the city between Central Expressway/Caltrain and El Camino Real being of higher density (Figure 1). Those neighborhoods also tend to have higher youth density (Figure 2).

According to the 2021 ACS 5-year estimates (Table 3), approximately 48 percent of the population of Mountain View identifies as white, and 33 percent identify as Asian, with Chinese being the predominant Asian ethnicity identified. Eighteen percent of the Mountain View community identifies as Hispanic or Latino.

Table 3 Race and Ethnicity in Mountain View (2021)

Race and Ethnicity in Mountain View	% of Residents
White alone	48.4%
Asian alone	33.3%
Black or African American alone	2.4%
Native American, Native Alaskan alone	0.4%
Native Hawaiian, Pacific Islander alone	0.0%
Some other race alone	5.8%
Two or more races	9.6%
Hispanic or Latino Population in Mountain View	**% of Residents**
Not Hispanic or Latino	82.0%
Hispanic or Latino:	18.0%

ACS 2021 5-year estimate

Approximately 5.5 percent of the community is below poverty level. The median household income in Mountain View is $158,104, while the mean is $213,751 (Table 4). As of August 2023, the median home price in Mountain View is $1.79 million.[1]

Table 4 Household Income Distribution in Mountain View

Income range	% of Residents
Less than $50,000	16.8%
$50,000 to $99,999	15.8%
$100,000 to $149,999	15.2%
Median household income: $158,104	
$150,000 to $199,999	13.0%
$200,000 or more	39.2%

ACS 2021 5-year estimate

[1] https://www.redfin.com/city/12739/CA/Mountain-View/housing-market, retrieved October 2023

Mode Share and Vehicle Access

Approximately 5.6% of workers 16 years and over in Mountain View bike to work (compared with 0.8% statewide and 0.5% nationally), with males riding at a higher rate than females (Table 5). Approximately 3.2% of workers reported walking to work (compared with 2.4% statewide and 2.5% nationally), with females walking at a slightly higher rate than males. More than half of Mountain View residents commute to work by driving alone, while over 30% work from home. Commute mode share in Mountain View and peer cities is discussed further in Part 4 and summarized in Table 8.

Figure 3 and Figure 4 show the geographic distribution of walking and biking commute behavior in Mountain View. While the Journey to Work data set of the U.S. Census only provides a snapshot of rates of walking and bicycling within the city by one trip purpose, it indicates that even with that limited trip focus, travel by active transportation modes are utilized in the city.

Table 5 Commute Mode Share in Mountain View (2021)

Commute Mode	Mountain View	California	United States
Drove alone	53.2%	70.1%	73.2%
Carpooled	4.5%	9.6%	8.6%
Public transportation	2.1%	4.1%	4.2%
Walked	3.2%	2.4%	2.5%
Bicycle	5.6%	0.8%	0.5%
Taxicab, motorcycle, or other means	1.2%	1.6%	1.4%
Worked from home	30.2%	11.4%	9.7%

Source: ACS 2021 5 Year Estimate

Almost 5% of households in Mountain View do not have a motor vehicle available (2021 ACS 5-year estimates). In looking at this data spatially, some block groups in Mountain View report up to 24% of households without access to a vehicle (Figure 5). Some of these block groups mirror those with higher percentages of population and youth density and bicycling to work.

Figure 1 Population Density

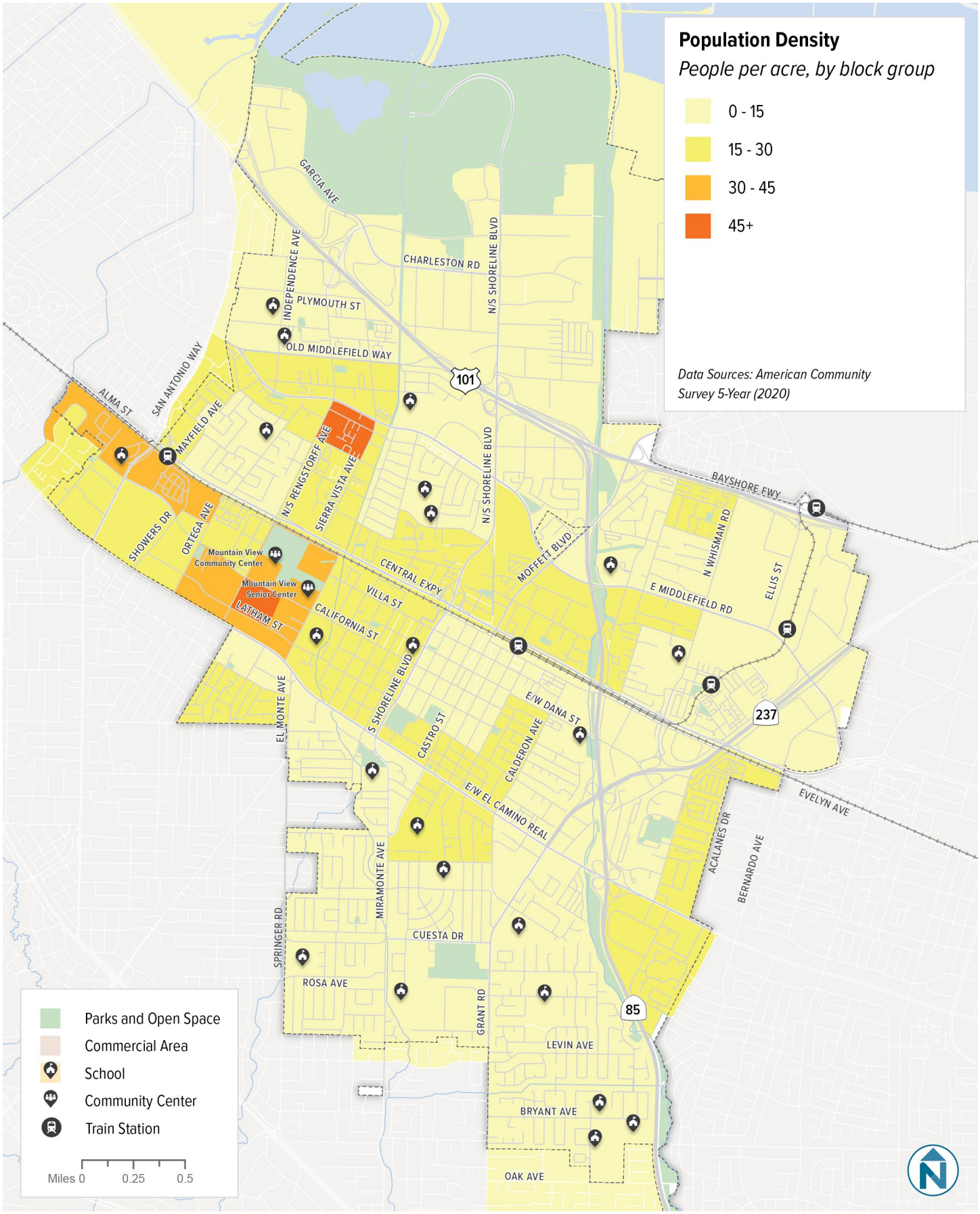


Figure 2 Youth Population Density (Ages 18 and Under)

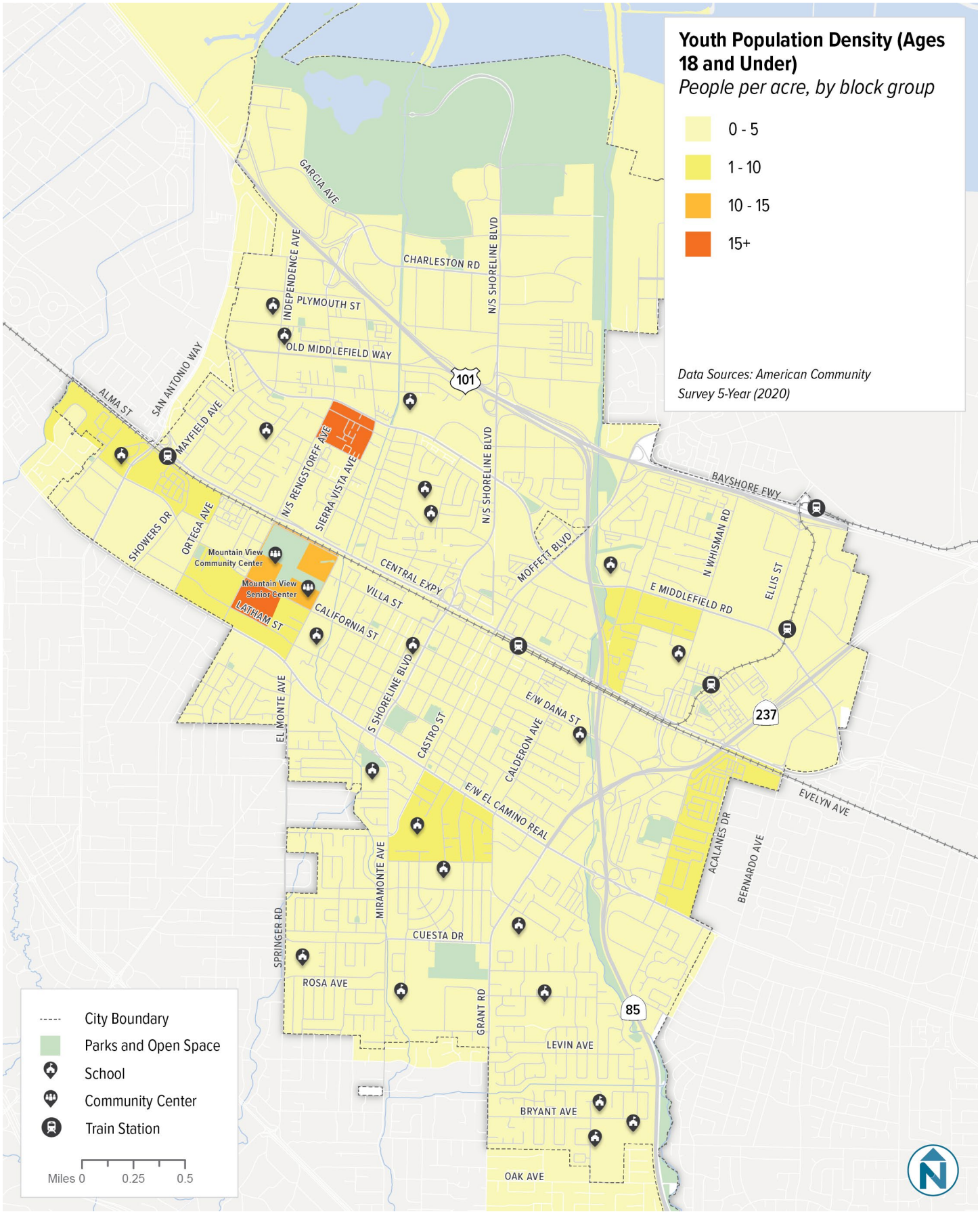


Figure 3 Mode Share – Percent of Commuters Who Walk

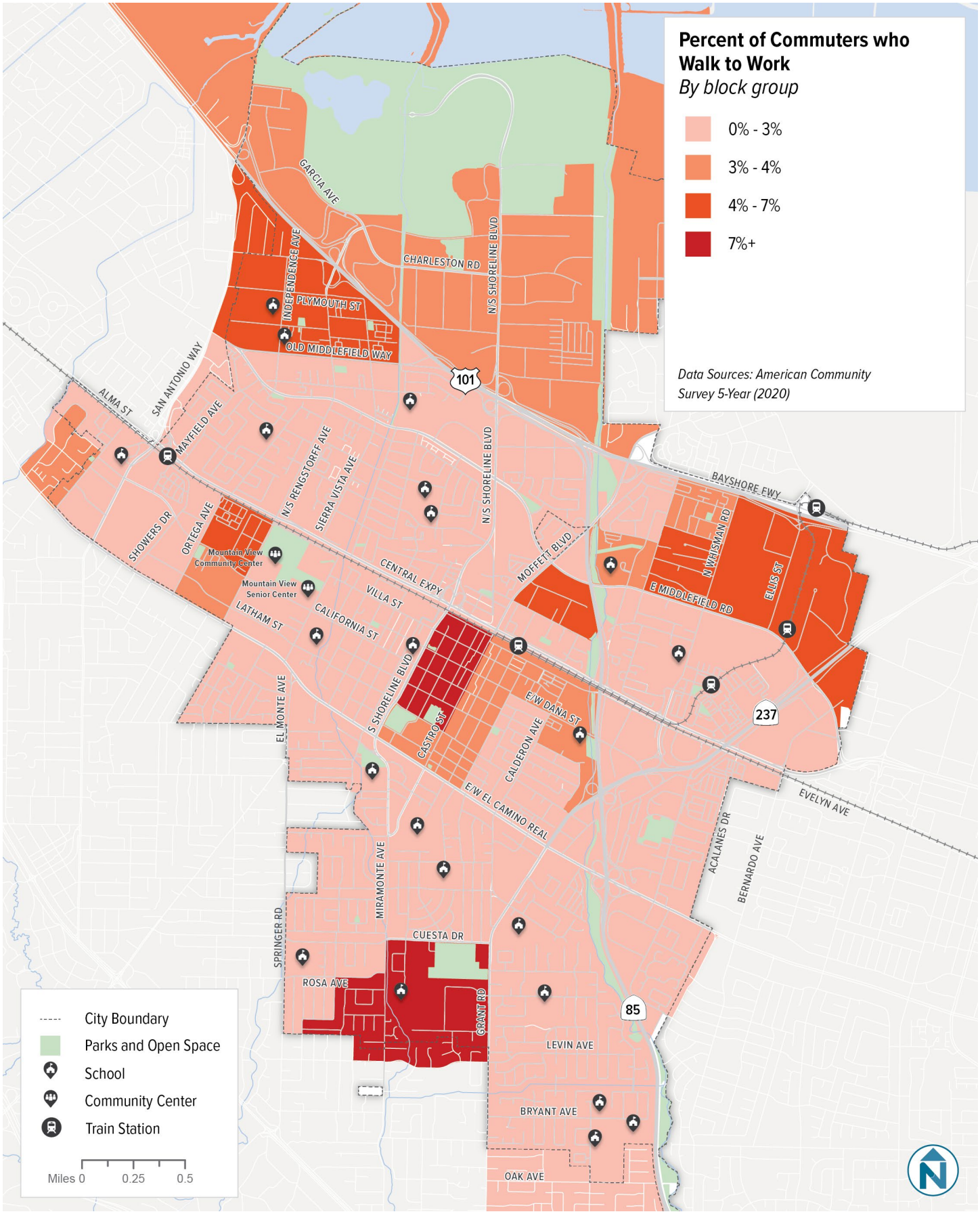


Figure 4 Mode Share – Percent of Commuters Who Bike

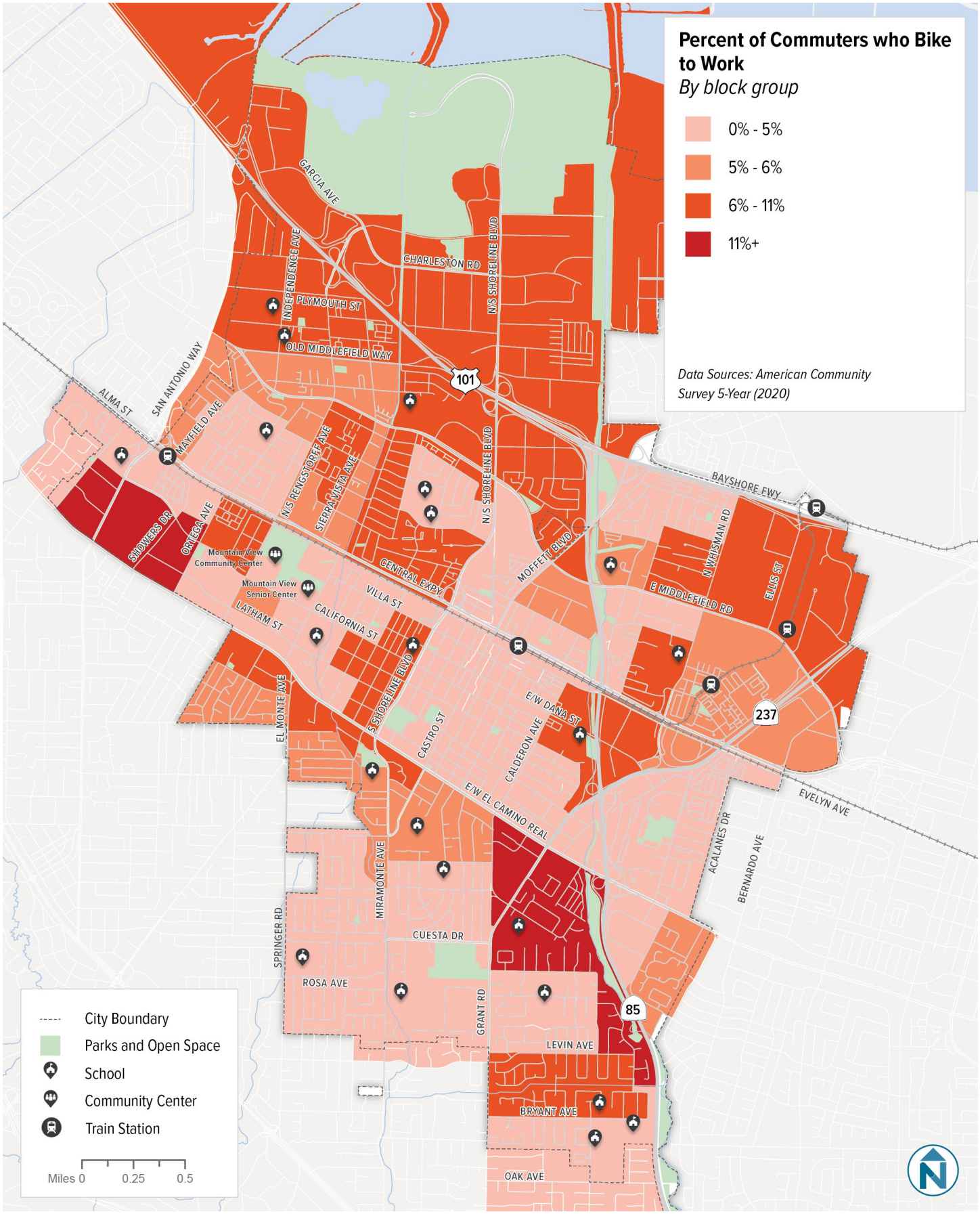
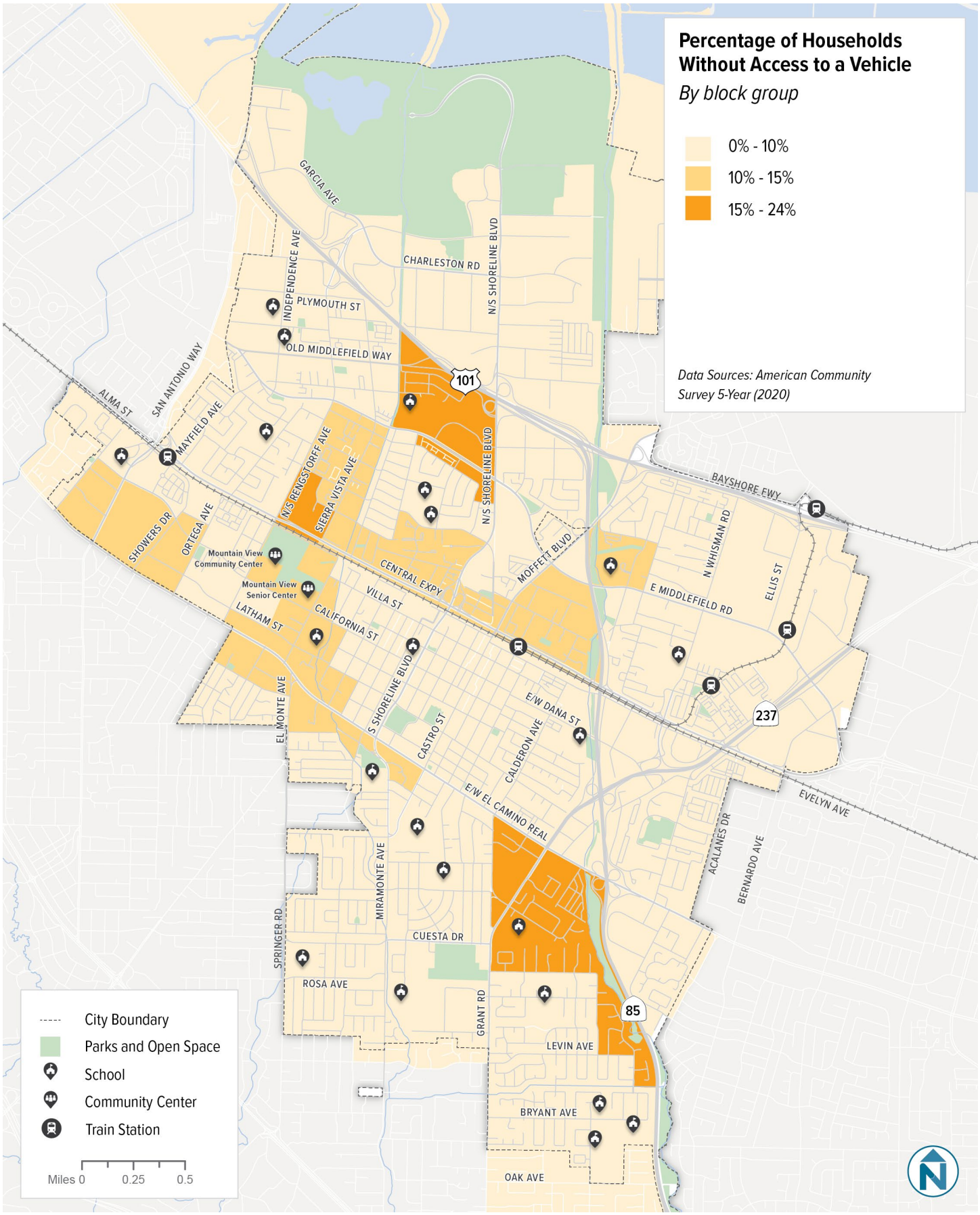


Figure 5 Household Vehicle Access



2. MOBILITY AND CONNECTIVITY

Pedestrian and bicycle networks are essential components of the transportation network in Mountain View. Evaluating the coverage and continuity of these networks will help the City identify where improvements are needed to better support the daily needs of everyone who lives, works, goes to school, and visits the City.

Pedestrian Network Coverage and Gaps

Mountain View has a well-connected sidewalk network that supports walking and rolling throughout most of the city. However, some gaps in the sidewalk network remain and issues such as obstructions, uplifting, deterioration and driveway slopes affect the safety and accessibility of the existing network. Some of these issues may result from existing City standard details and criteria for sidewalks, curb ramps, and street geometry, which do not reflect current best practices.

Figure 7 shows the extent of the existing sidewalk and pedestrian network in Mountain View today, including sidewalks, trails, and pedestrian paseos, and highlights places where there are gaps, or missing segments in the sidewalk network, along with areas where the sidewalk is less than four feet in width.

While there are scattered gaps in the network throughout the city, there are neighborhoods with a larger concentration of missing and narrow sidewalks, such as Moorpark Way and along Wright Avenue, or in the southern portion of the city where the network is absent altogether, such as west of Miramonte between Marilyn and Barbara, and southeast Mountain View between Grant Road and SR-85. Participants in community engagement activities confirmed the missing or incomplete sidewalks on one or both sides of Martens Avenue, Sleeper Avenue, Franklin Avenue, Eunice Avenue, and Carmelita Drive. These streets connect pedestrians from residential streets to nearby parks and schools, such as Sleeper Park, Cuesta Park, Cooper Park, Stevens Creek Trail and Amy Imai Elementary School.

Survey participants also noted several issues with sidewalks on Moffett Boulevard near the Stevens Creek Trail access point, such as sidewalk gaps, the lack of sidewalks on both sides of the street, the condition of sidewalks, and the need for safer crossings to access the trail.

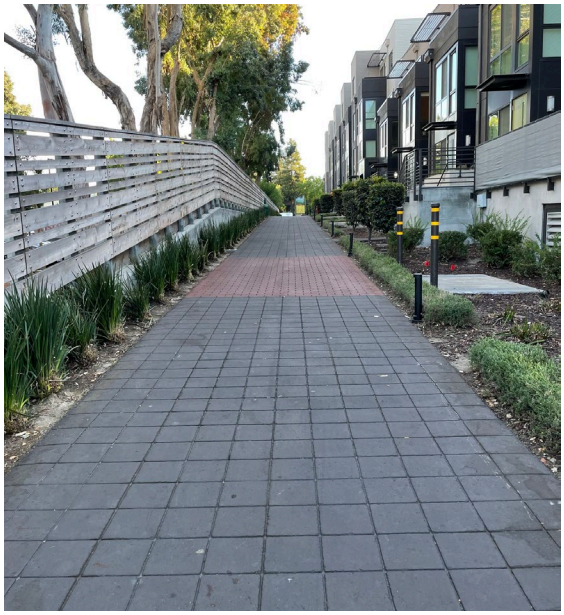
Sidewalks are missing in all six of Mountain View's mobile home parks (Santiago Villa, Sahara Mobile Village, New Frontier, Moorpark Mobile Homes, Moffett Mobile Home Park and Sunset Village). Although streets in these communities are privately owned, there are opportunities to improve pedestrian network connectivity with the surrounding areas, better connecting mobile homes to the City's transportation network. Residents in these neighborhoods, where access to vehicles is lower (Figure 5), have an increased reliance on walking and other non-driving transportation modes to meet daily travel needs.

Mountain View's pedestrian network includes more than just sidewalks and crosswalks—a host of paseos and trails also support connectivity and mobility throughout the City for people who walk (Figure 7). A paseo is a short connection, often utilizing a public access easement that allows for increased pedestrian and cycling connections. Paseos most commonly occur in the middle of very large blocks (Figure 6).

Paseos are a valuable tool to provide public permeability for pedestrians and cyclists through private areas. These are often built as part of multi-family residences in Mountain View. They have the added benefit of providing "eyes on the street," which increases safety and provides a sense of community. Participants in thRengstorff Park Walk Tour noted how the paseo connecting Latham to El Camino between Rengstorff and Ortega improved access to destinations on El Camino Real.

Survey respondents suggested more pathways, or paseos, through apartment and office complexes near schools and on routes to transit, such as the Caltrain stations, to increase active transportation accessibility.

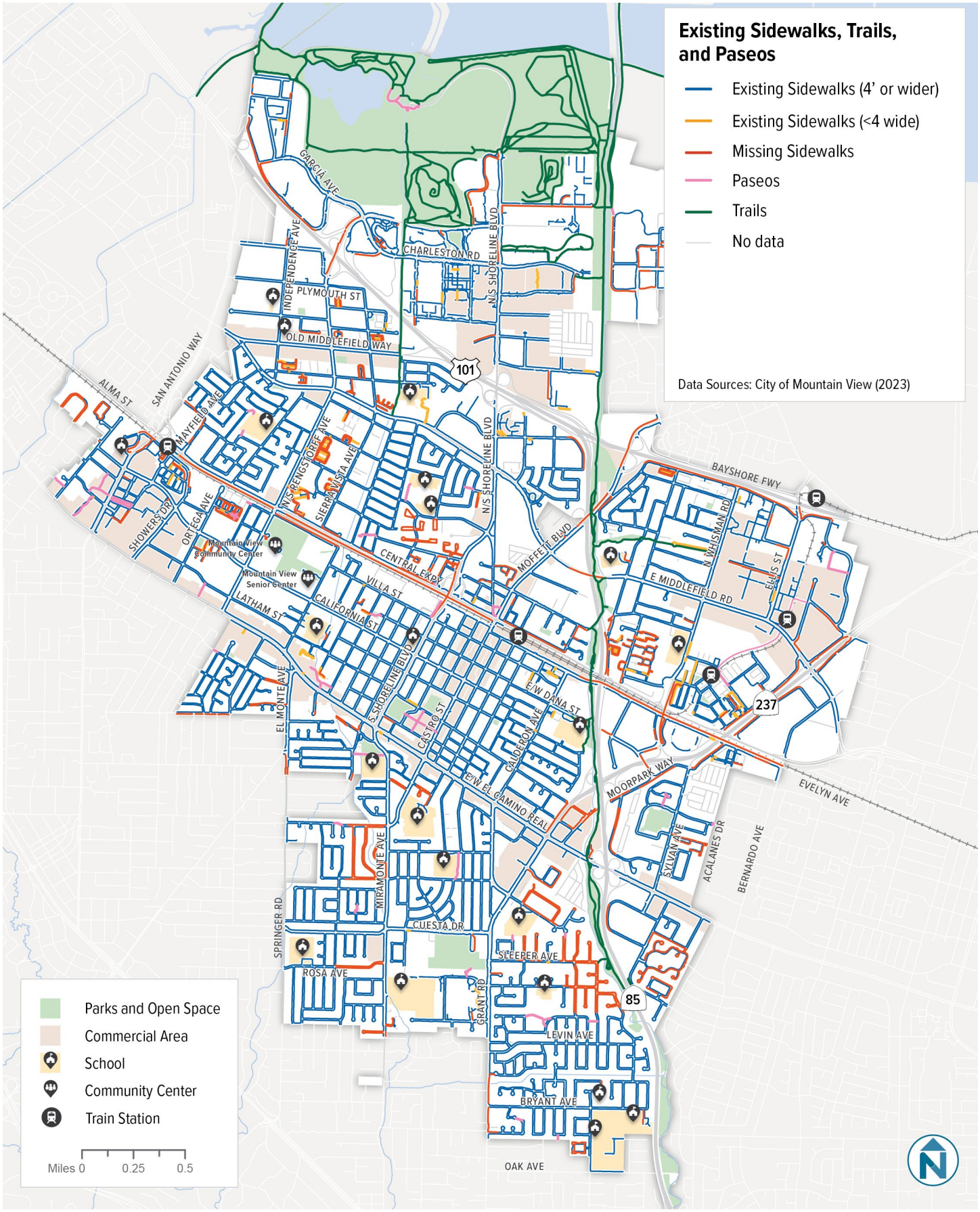
Figure 6 Examples of Paseos and Car-Free Connections in Mountain View



Paseos are a useful tool to provide public access through private areas. These are often built as part of multi-family residences. They have the added benefit of providing "eyes on the street," which increases safety.

This separated pedestrian and bike connection at the southern end of Sterling Street provides a car-free connection to Central Expressway at Moffett Blvd.

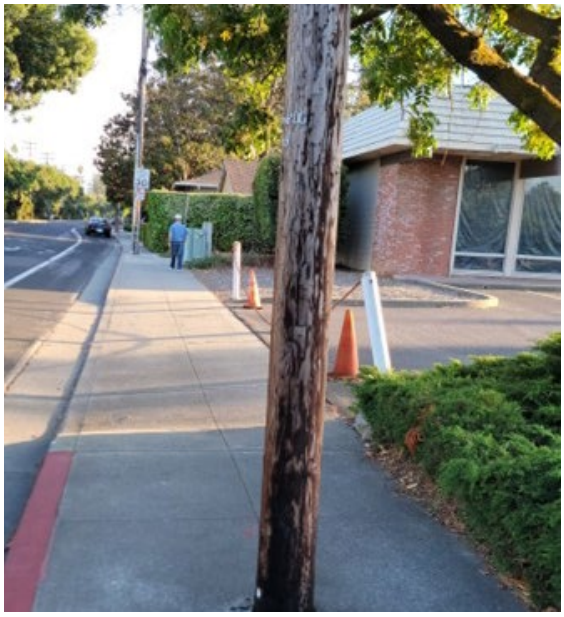
Figure 7 Pedestrian Network in Mountain View



Sidewalk Network Coverage and Accessibility

Although the city's sidewalk network is 96% complete, obstructions and poor physical conditions in many locations result in safety and accessibility concerns. On each of the three walk tours, participants noted that the sidewalk network contained obstructions (e.g., utility poles and signs), uplifting, missing curb cuts, overgrown vegetation, poor pedestrian lighting and narrow sloped sidewalks with frequent driveway interruptions (Figure 8). Survey respondents noted the lack of continuity and poor condition of sidewalks along Moffett Avenue, Whisman Road, Rengstorff Avenue, and throughout Old Mountain View.

Figure 8 Examples of Different Sidewalk Conditions in Mountain View



Sign or telephone poles in the walking area of the sidewalk were noted as a safety concern and a reason people did not enjoy walking in Mountain View.

Sidewalks should be set back from the street, wide enough to allow comfortable side-by-side walking, and have trees spaced close enough to provide consistent shade like this one on Evelyn Street.

At many driveway locations, the design does not meet Public Rights of Way Accessibility Guidelines (PROWAG) regarding slope and vertical discontinuities (Figure 9). The City of Mountain View is actively developing an ADA Transition Plan which will seek to identify non-compliant curb ramps, sidewalks, and other infrastructure in the right-of-way and develop a work plan to bring those locations into compliance. Additionally, community input indicated that parked cars often block the driver's view of pedestrians on the sidewalk as they pull into driveways.

Figure 9 Example of a Non-Compliant Sidewalk

This sidewalk, which is sloped to accommodate vehicle traffic entering and exiting the driveway, is not compliant with ADA standards or PROWAG for accessibility.

Code Review Findings: Sidewalk Network Coverage and Accessibility

Mountain View has adopted Caltrans standards for curb ramps

- *These standards do not include directional ramps, which are helpful to people with vision impairments to orient them into the crosswalk.*

SDC Chapter 3.5.1 Commercial driveways can be up to 35' wide

- *Wider driveways decrease the legibility of the sidewalk and allow for fast moving vehicles entering a parking lot or driveway. Driveway width and maintenance were noted during walk tours as a particular issue.*

SDC Chapter 3.5.2 Minimum curb return radius is set at 30'

- *Per FHWA, there is a direct correlation between curb radius and turning speed of vehicles. Curb radius should be a contextual decision. Walk tour participants noted the speed at which drivers are turning – both on green and during red light intervals*

Policy on Unimproved Streets

The Policy on Unimproved Streets adopted by City Council in 1993 has significant impacts to the sidewalk network in Mountain View. This policy affirms the direction to not construct sidewalks in residential areas unless homeowners initiate an assessment district to fund these sidewalk. The policy references resident desires to maintain "rural character" of these streets by not improving streets to current standards. Many missing sidewalks are in these unimproved areas.

Bicycle Network Coverage and Gaps

The city is has a varied network of bicycle facilities, some of which are well connected and some of which are separated by gaps or barriers. Different groups of people have different levels of comfort, physical ability, and levels of risk they are willing to accept in order to travel through the city. In the development of Access MV, an All Ages and Abilities (AAA) Bike Network was identified as made up of existing and planned/funded projects (Figure 12). Facility types represented in the AAA existing and planned/funded network include but are not limited to bicycle boulevards, trails, protected bikeways and bike lanes on lower volume and speed streets (described in Figure 10). The definition and methodology used to develop the AAA network as part of access MV will be further analyzed and revisited during future project phases.

In some areas, the existing and planned/funded AAA network is robust, such as in the northern parts of the city, including North Bayshore and Shoreline Park. In other areas, such as the residential neighborhoods in the city's southern parts, bicycle facilities are sparse, disconnected, or create a bicycle level of traffic stress (BLTS) that is too high to meet AAA standards. For example, some major roads such as Springer Road, Miramonte Avenue, and the southern portion of Grant Road include bike lanes, but the configuration of those roadways and vehicular speeds do not qualify these facilities as suitable for all ages and abilities, particularly where they approach and intersect with El Camino Real. Currently, the City of Mountain View does not have a continuous AAA-quality connection that runs from east to west for cyclists through some parts of the City.

The Stevens Creek Trail provides a continuous AAA-quality connection between the northern and southern parts of the City for bicyclists. However, some neighborhoods have limited bicycle connections to the trail network. On the bike tour conducted on May 13, 2023 and via the ATP survey, community members noted that the design of the trail access point at Evelyn Ave and the on-ramp for Highway 85 is problematic due to the presence of bollards and constrained crossing space next to a high-stress intersection. Additionally, the trail access point at El Camino Real does not provide an AAA bicycle connection to the surface streets. Survey participants also noted the lack of sidewalks and crosswalks at the trail access in several locations, such as Moffett Boulevard and West Middlefield Road.

Responses from the ATP survey identify several routes that are challenging for walking, bicycling and rolling, including both existing facilities that are planned for the AAA network and planned facilities, such as but not limited to Rengstorff Avenue between El Camino Real and Montecito Avenue, Miramonte Avenue/Shoreline Boulevard from Sonia Way to Wright Avenue, Escuela Avenue between El Camino Real and Villa Street, and the entirety of Middlefield Road (Figure 13). Other routes rated as most challenging, including but not limited to the entirety of El Camino Real, Grant Road between Bentley Square and Centre

Street, and significant portions of Central Expressway, currently lack bicycle facilities but are also planned for the AAA network (Figure 12).

Beginning in winter 2023, the City and Caltrans are partnering to implement bike lanes (Class II) and flex post-protected bikeways (Class IV) along El Camino between Sylvan Avenue and Rengstorff Avenue, which will significantly improve bicycle network connectivity for many community members. Nonetheless, community feedback about the El Camino corridor highlights the need to continue supporting and expanding bicycle access across and around El Camino Real.

Figure 10 Types of Bicycle Facilities in Mountain View's All Ages and Abilities (AAA) Bike Network

Bicycle boulevards (Class III) are shared streets with low motor vehicle speeds and volumes with features and pavement markings designed to prioritize bicycles.

Trails (Class I) are shared-use bicycle and pedestrian paths that are separated from motor vehicle traffic. In Mountain View, most trails are paved.

Protected bikeways (Class IV) are bicycle facilities with physical barriers between bicyclists and motorized vehicles. Physical barriers can be provided with flexible plastic posts, concrete, plants and trees, or other treatments.

Bike lanes (Class II) are bicycle facilities that do not include a physical barrier separating cyclists from motor vehicle lanes.

Bike Parking and End-of-Trip Facilities

Beyond the availability of community bikeways, a complete bicycle network includes other infrastructure and facilities that support the needs of people who bicycle. A comprehensive

bicycle network includes safe and secure bike parking, accurate bicycle detection, bicycle maintenance stations, restrooms, drinking fountains, and clear wayfinding for bicyclists (Figure 11). Survey participants noted the lack of sidewalks and crosswalks at the trail access in several locations, such as Moffett Boulevard and West Middlefield Road.

Code Review Findings: Bicycle Network Coverage and Gaps

City Code Section 36.22.50, the provision of bike parking is a function of vehicle parking.

Existing code does not adequately address the location, type, and amount of bike parking required. Bike parking is a visual way to remind people of the option of biking to a destination and also provides a safe, appropriate place to lock their bike.

City Code Section 36.32.85

The provision of bike parking requires vehicle parking; rack style and location criteria could be improved and strengthened

Figure 11 Examples of Bike Racks and Pedestrian Signal Buttons

This style of bike rack is the most secure and is placed appropriately. The Mountain View branding is a nice touch.

Passive detection for bikes is not always reliable; a push button is one solution. When bicycles are not detected, people on bikes must wait until a car comes or they are tempted to run the red light.

Figure 12 Existing and Planned/Funded AAA Bicycle Facilities vs. Existing Bicycle Network

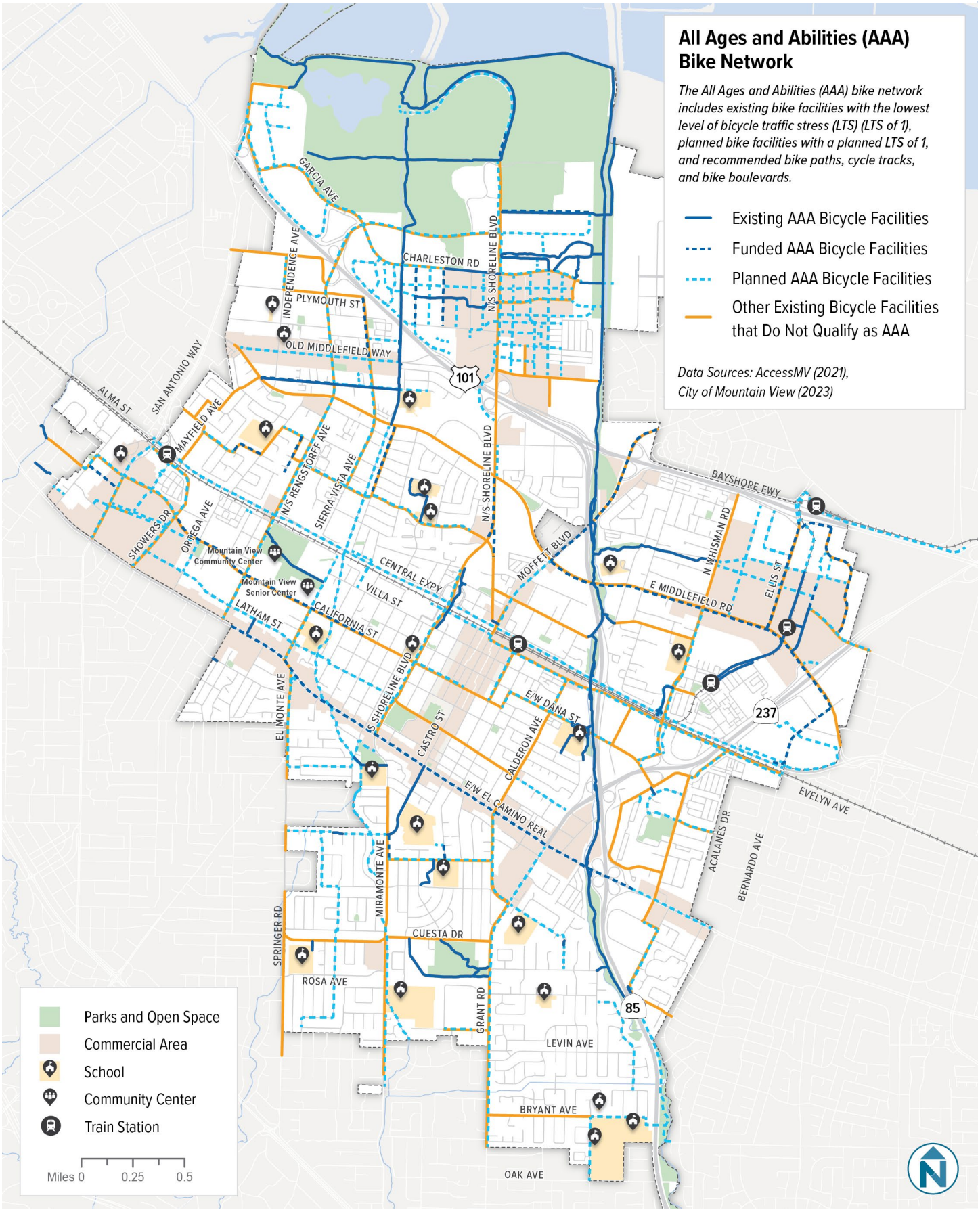


Figure 13 Bicycle Network and Challenging Routes for Walking, Biking, and Rolling

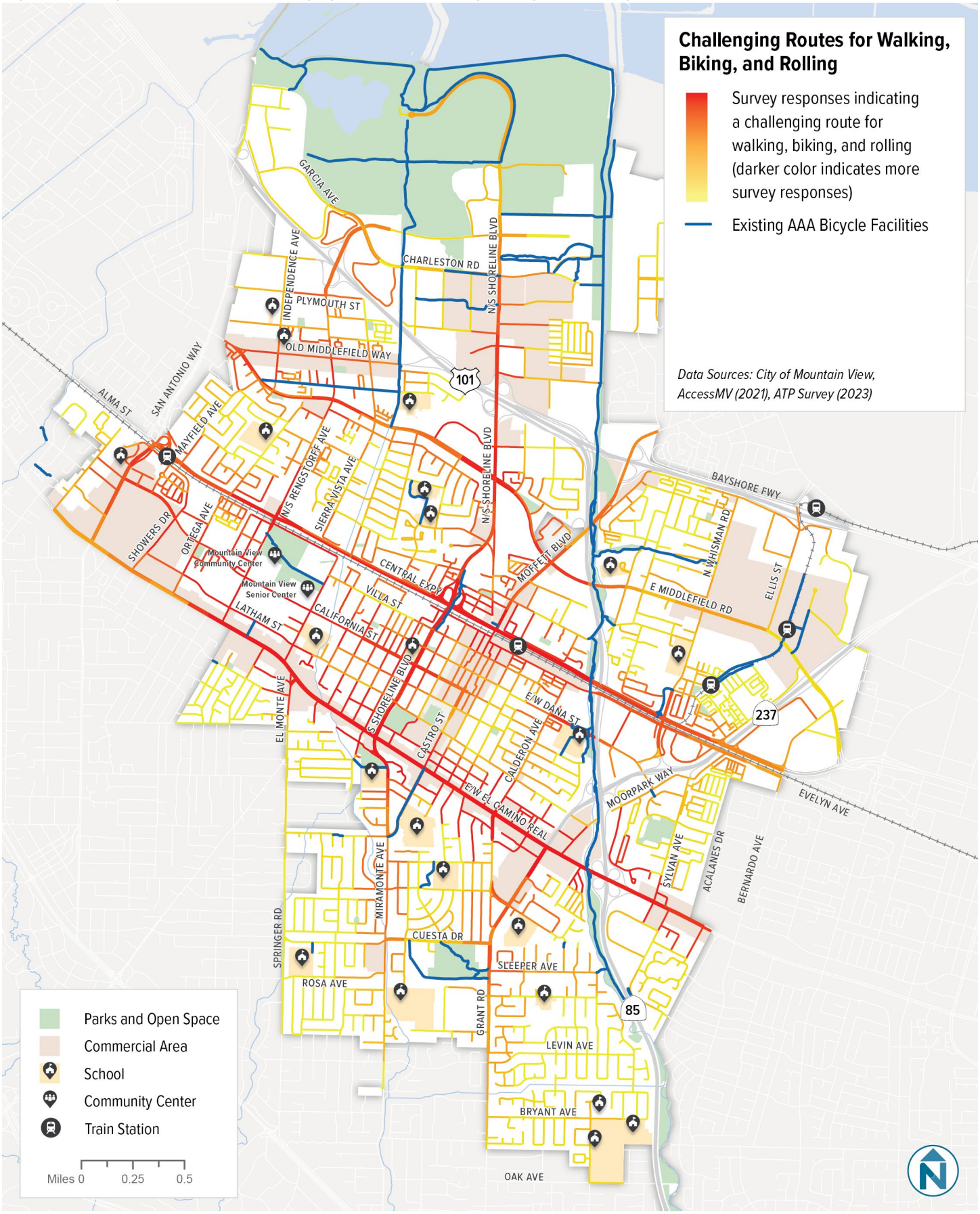


Figure 14 Household Vehicle Access and Existing Bicycle Network

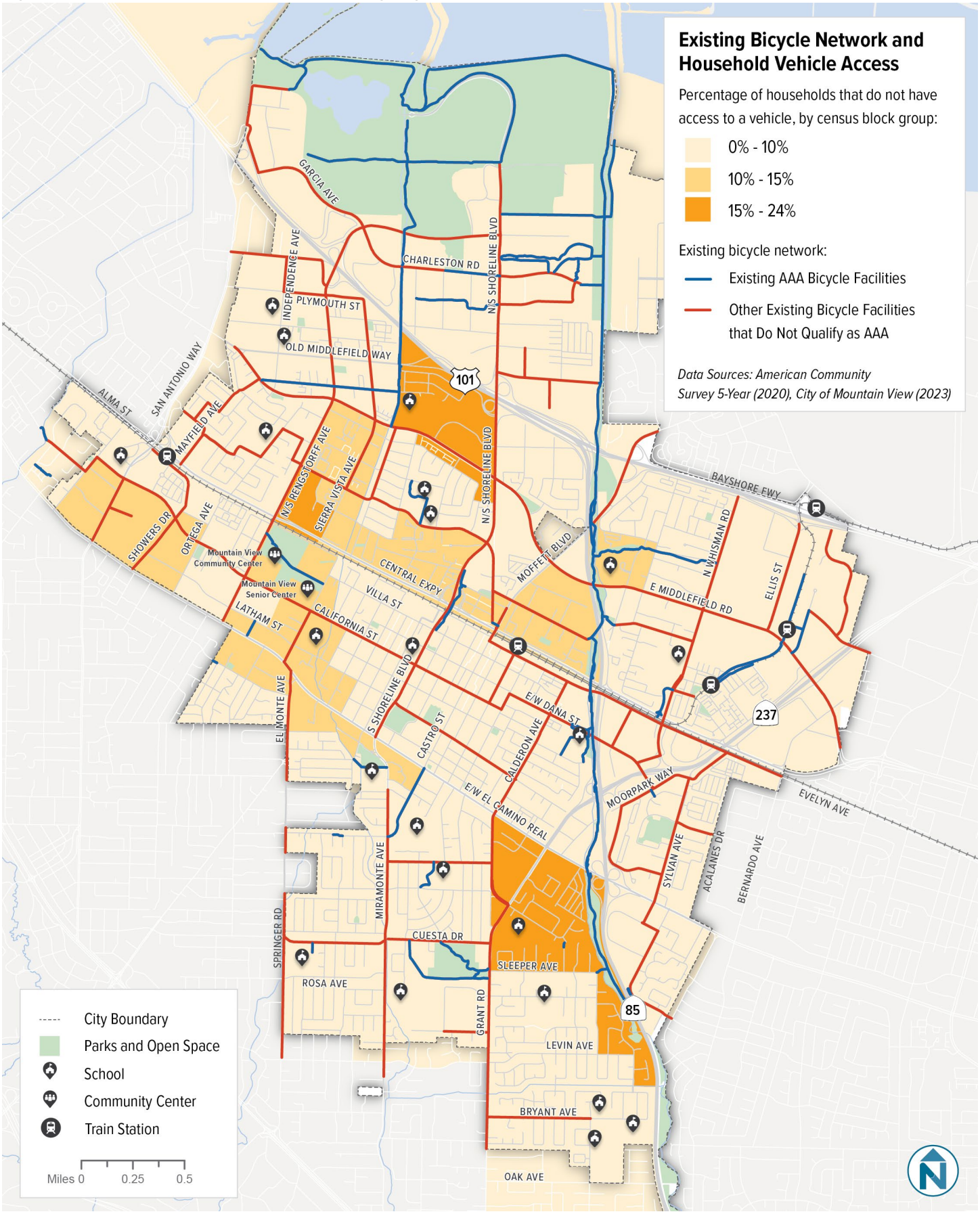


Table 6 Top 10 Challenging Routes as Indicated by Community Input.

Rank	Challenging Route
1	El Camino Real (between Dale Avenue and Rengstorff Avenue/Ortega Avenue)
2	Shoreline Boulevard (between Sonia Way and Wright Avenue)
3	Central Expressway (between Thompson Avenue and SR-85)
4	Grant Road (between Bentley Square and SR-85)
5	Rengstorff Avenue (between El Camino Real and Montecito Avenue)
6	Latham Street (between Ortega Avenue and Leksich Avenue)
8	Escuela Avenue (between El Camino Real and Villa Street)
9	California Street (between Chiquita Avenue and Ortega Avenue)
10	Leland Avenue/Crisanto Avenue (between College Avenue and Escuela Avenue)

Source: ATP Survey (2023)

Pedestrian and Bicycle Connectivity

Although the City's sidewalk network provides consistent connectivity and coverage within most neighborhoods, pedestrian and bicycle access between some areas is hampered by infrequent or challenging crossings.

East/West, North/South Connections

Many survey respondents highlighted the need for better or safer pedestrian and bicycle crossings throughout the city. Survey respondents identified challenges at intersections on many major east-west roadways like El Camino Real, Central Expressway, and Highway 101 interchanges, particularly where they intersect with significant north-south roadways such as Rengstorff Avenue, Shoreline Boulevard and Castro Street/Moffett Boulevard (Figure 15). Other top locations for improved crossings suggested through survey responses and community meetings include Grant Road and El Camino Real, Escuela Avenue and El Camino Real, Showers Drive and California Street, Rengstorff Avenue and West Middlefield Road (Figure 15). Some of these locations are discussed further in the following section (Part 3: Safety and Comfort).

Some of Mountain View's busiest arterial roads have long distances between marked crosswalks (Figure 16). Some of the places with the longest distance between marked crosswalks in Mountain View include El Camino Real, where some distances between crossing are longer than 1,300 feet or ¼ mile and Central Expressway, due to the limited access and crossing locations because of the railroad tracks. Other arterial roads that have segments

with long distances between marked crossings include East Middlefield Road, segments of Shoreline Boulevard, and Rengstorff Avenue.

This issue is not isolated to major arterials. Figure 17 shows that longer block lengths exist on several segments throughout the city, such as Showers Drive, Latham Street, California Street, East Middlefield Road, and Grant Road. Longer distances between crosswalks may challenge a traveler's desire to walk or tempt them to make a crossing between intersections that may be unsafe due to vehicles' sight lines, speeds and volumes.

Survey respondents noted that the lack of crossings creates a significant barrier to access for pedestrians and bicyclists traveling north and south, especially when accessing downtown Mountain View from the south.

El Camino Real

El Camino Real plays a primary route within and through Mountain View and as a major commercial corridor, and safe pedestrian and bicycle connections along and across El Camino Real were a recurring concern for community members. As noted earlier, in many locations, the distance between marked crosswalks on El Camino Real is greater than 1,300 feet (¼ mile).

Three new Pedestrian Hybrid Beacons (PHBs) will be installed on El Camino Real at Bonita Avenue, Crestview Drive, and Pettis Avenue as part of a Caltrans repaving project that will begin construction in 2024. These PHBs will improve connectivity and reduce the distance between some intersection crossings. In addition to the three PHBs and the aforementioned bike lanes and flex post-protected bikeways, plans to improve El Camino Real include curb ramp upgrades, high visibility crosswalks at all signalized intersections, and corner bulbouts at some of the unsignalized cross streets (Figure 18). Further mobility and connectivity enhancements, such as protected intersections, will be addressed through City capital projects following the Caltrans repaving work.

Figure 15 Pedestrian Network and Challenging Spots for Walking, Biking, and Rolling

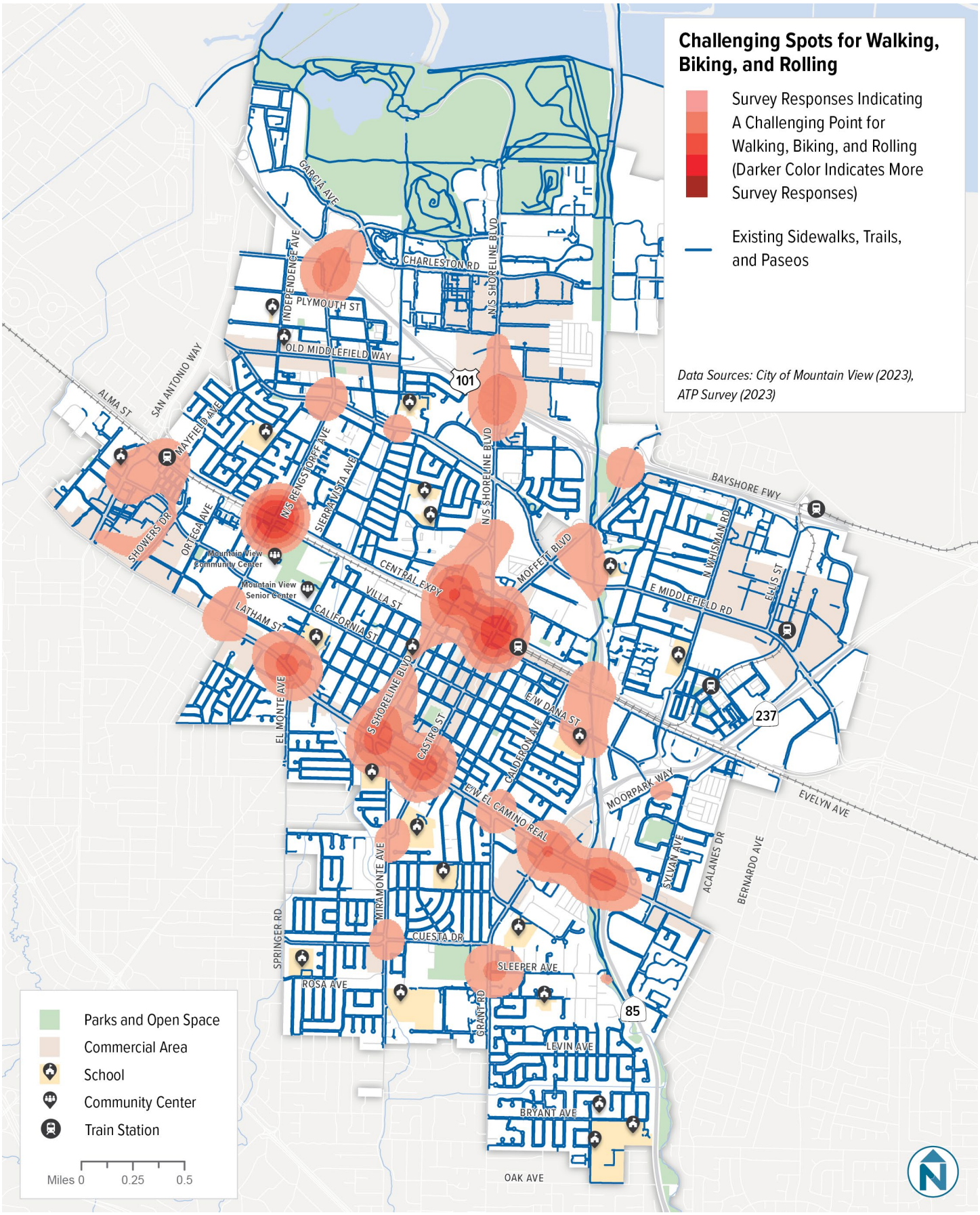


Figure 16 Distance Between Marked Crosswalks (Major Roads)

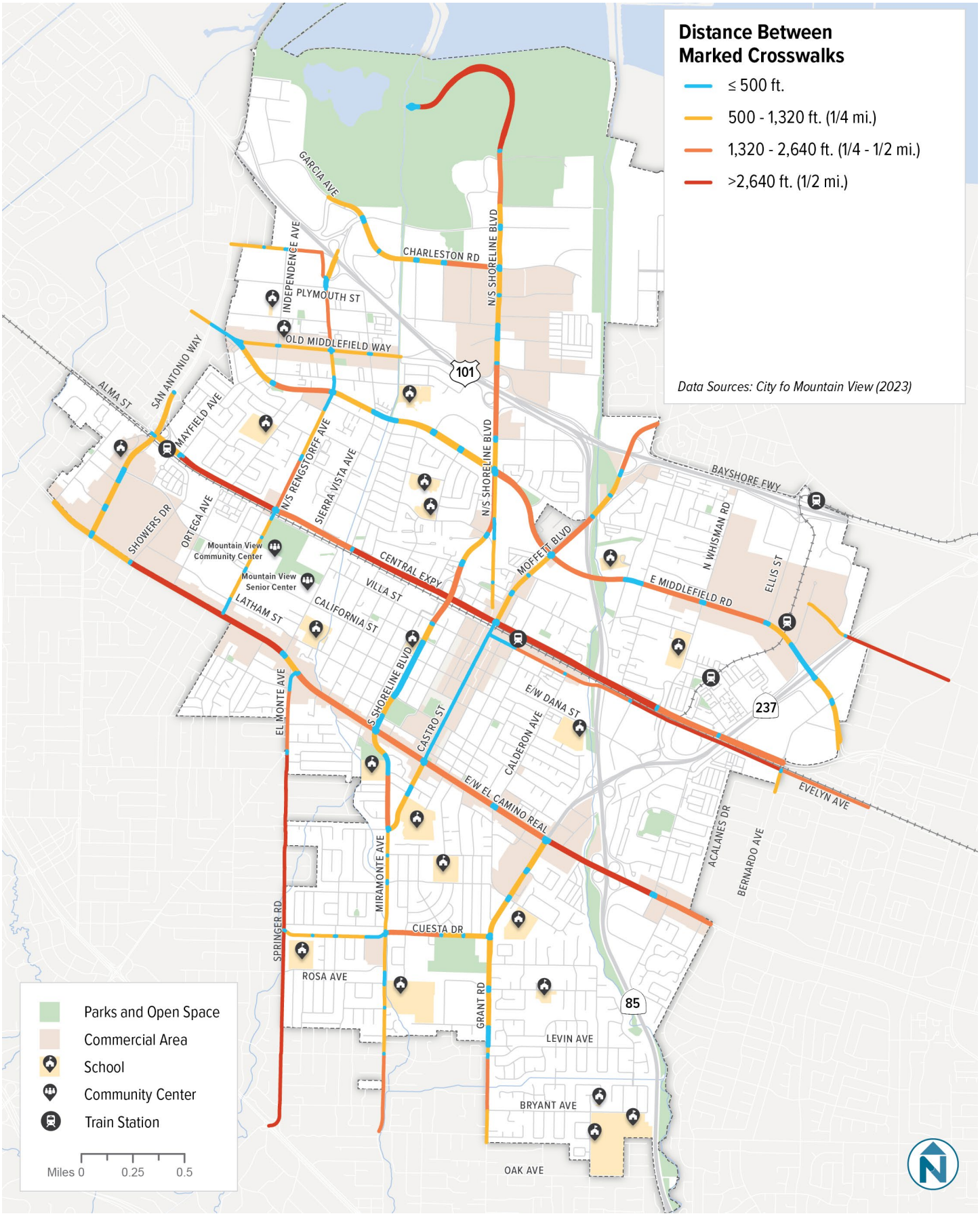


Figure 17 Distance Between Pedestrian Crossings (Marked or Unmarked, All Roads)

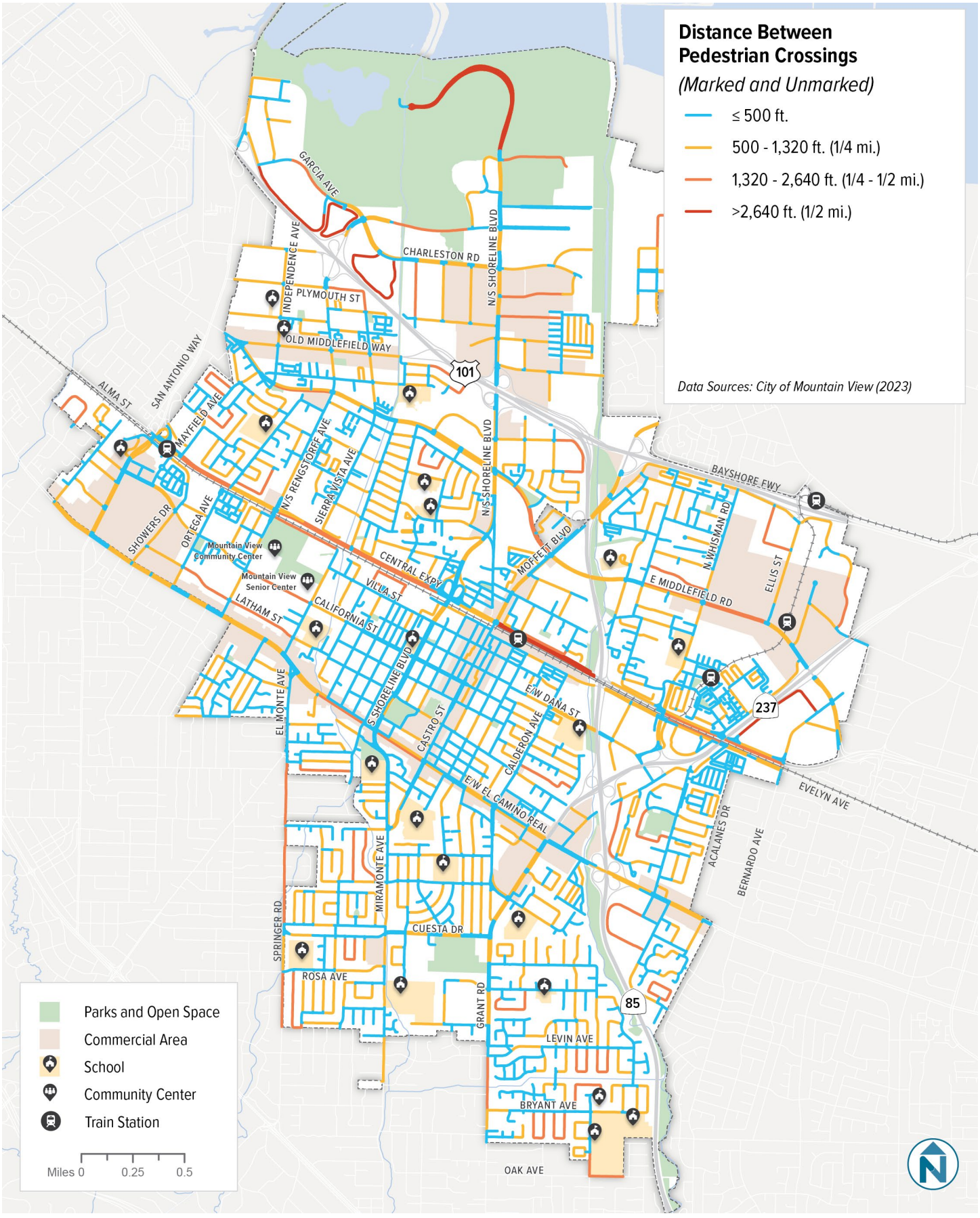
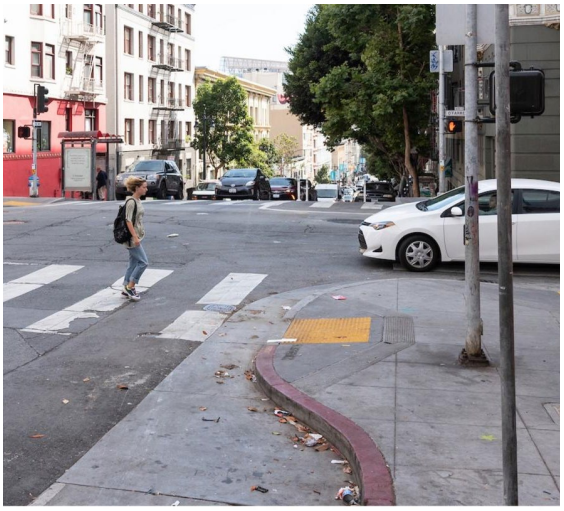


Figure 18 Examples of a Pedestrian Hybrid Beacon (PHB) and Curb Bulbout

PHBs include flashing lights and marked crossings that alert vehicles to crossing pedestrians (image courtesy of City of San Luis Obispo).



Curb bulbouts reduce the distances between curbs for crossing pedestrians and reduce vehicle turning speeds (image courtesy of the City of San Francisco).

Table 7 Top 10 Challenging Spots for Walking, Biking, and Rolling as Indicated by Community Input

Rank	Challenging Spot
1	Rengstorff Avenue & Central Expressway (and by extension: Rengstorff Avenue & Leland Avenue/Crisanto Avenue)
2	Castro Street/Moffett Boulevard & Central Expressway (and by extension: Castro Street & Evelyn Avenue)
3	El Camino Real & Castro Street
4	Central Expressway & Shoreline Boulevard
5	Grant Road & El Camino Real
6	Miramonte Avenue/Shoreline Boulevard & El Camino Real
7	SR-85 & El Camino Real
8	SR-101 & Shoreline Boulevard
9	SR-85 & Central Expressway
10	El Camino Real & Escuela Avenue

Source: ATP Survey (2023)

3. SAFETY AND COMFORT

Many places in Mountain View provide safe and enjoyable spaces for people who walk, bike, and roll—especially places where people feel separated from vehicles and offer access to nature and open space.

Safe and Comfortable Places and Routes

Many survey respondents and community members identified parks and trails in Mountain View as their favorite places to walk, bike, or roll (see Figure 19 and Figure 20). For people who bike, trails are both routes and destinations where the car-free environments add to riders' feeling of safety and enjoyment. Survey respondents highlighted a wide variety of uses for the Stevens Creek Trail, including recreational bike rides with family and kids, commuting to work, and accessing key destinations like grocery stores and the library. Survey respondents expressed appreciation for the safe pedestrian and bicycle environment of Sylvan Park and Rengstorff Park, both in terms of getting to and from the parks by walking or rolling and for the parks themselves. In other places, such as Shoreline Park, survey respondents reported driving to and from these places due to a lack of safe access routes for bicyclists and pedestrians.

Downtown, especially the pedestrian-only portion of Castro Street, was celebrated as a great place for walking by survey respondents and community conversation participants. The safe and enjoyable environment, the appeal of no automobile traffic, and the availability of many fun activities and destinations, make this area a favorite for community members (Figure 20).

Figure 19 Examples of Trails in Mountain View

Trails that provide a space for walking and biking away from motorized vehicles were popular destinations for survey respondents.

Stevens Creek Trail's overpass provides a safe and comfortable connection over Evelyn Street and CalTrain tracks.

Code Review Findings: Safe and Comfortable Places and Routes

In SDC, Chapter 7 - Street Lighting and Chapter 9 and SP&D, Chapter 9 Trees and Chapters 36 and 37 – Street Lighting are also both out of date with current City practice and best practices. A more robust and detail instruction is required.

- *Street trees and pedestrian scale lighting are important to both the safety and comfort of the street. They both create a sense of place.*

Figure 20 Examples of Downtown Pedestrian Amenities in Mountain View

Survey respondents enjoy walking in the car-free segments of Castro Street downtown.

This life-size chess board near City Hall makes the plaza an inviting place for people to gather.

Collisions Involving Bicycles and Pedestrians

From 2015 to 2022, there were **563 reported collisions involving people walking and biking in Mountain View, including 63 fatal or severe injury collisions.** While these collisions have occurred in all parts of the City, many are concentrated on arterials with higher vehicle speeds, more vehicle lanes, and higher traffic volume.

In Mountain View, 73% of fatal and severe injury collisions occur on streets with posted speeds of 35 mph or above. However, these streets represent only 20% of the total street network in Mountain View. Fatal and severe injury collision data from 2015-2022, in Figure 22 and Figure 23, highlight the concentration of these severe collision types on higher-speed corridors, particularly for pedestrian collisions. Additionally, as seen in Figure 24 and Figure 25, 60% of crashes occur in commercial areas, including Downtown Mountain View and El Camino Real, which are often adjacent or intersected by streets with posted speeds of 35 mph or above. These are areas that survey respondents also noted as challenging locations. These findings are important to highlight because of the desirability and sometimes necessity to travel to commercial areas by walking and rolling.

These maps also highlight that a high number of collisions involving people biking and walking occur on El Camino Real, which are often more severe than other roadways in the City. Through survey responses and community conversations, many Mountain View residents expressed safety concerns about walking and biking along or across El Camino Real

and Central Expressway. Community members in many of the engagement activities reported that drivers only look left when making a right on a red light, rather than stopping and looking both right and left for people crossing. This lack of yielding to pedestrians is a contributing factor in several collisions and near-misses.

While these collision numbers are high, they likely don't represent the total number of collisions that occur in the City of Mountain View. Collisions, particularly pedestrian and bicycle collisions, are historically underreported in many communities for a variety of reasons.

Near-misses (Figure 21) are also not consistently reported. Survey respondents and community members participating in walk tours and small group meetings noted several locations where near-misses often occur, including but not limited to Showers Drive between Latham and California Streets, the intersection of Escuela Avenue and El Camino Real, and Miramonte Avenue and Cuesta Drive. A survey respondent noted that the lack of sidewalk and aggressive vehicular traffic at Carol and Sleeper Avenues had led to several near misses along this Suggested Route to School. AskMV, the City's online suggestion and complaint service, includes a function to allow people to report near-misses. However, if the reports from the walk tours are any indication, the frequency of near-miss entries are significantly lower than the near-miss lived experience on the streets.

The maps also highlight that connections across Highway 101 present safety challenges for people walking and biking. Pedestrian crossing opportunities are sparse, and community members note that signal wait times can make walks longer and more unpleasant. While some connections across 101 include pedestrian facilities, survey respondents report safety risks and conflicts with vehicular movements in these areas.

It should be noted that survey concerns may not reflect travel patterns. Figures 23 and 24 indicate where respondents have traffic concerns from a walking and biking perspective, and not where they actually travel. Because of this, crash data may seem in contradiction with concerns. However, crashes cannot occur where people are not actually walking or cycling. Many areas of indicated concern do not have high crash rates, which may reflect the fact that people are too concerned about safety to walk or bike through those locations.

Lastly, many survey respondents and community members identified safety challenges where Castro Street, Central Expressway, Moffett Boulevard, and Caltrain intersect. Although the Transit Center Grade Separation and Access Project will help address many of these bicycle and pedestrian safety concerns, community feedback underscores the centrality and importance of this area for many people who walk, bike or roll in Mountain View.

Figure 21 Reported Near-Miss Collisions Involving People Walking or Biking, 2021-2022

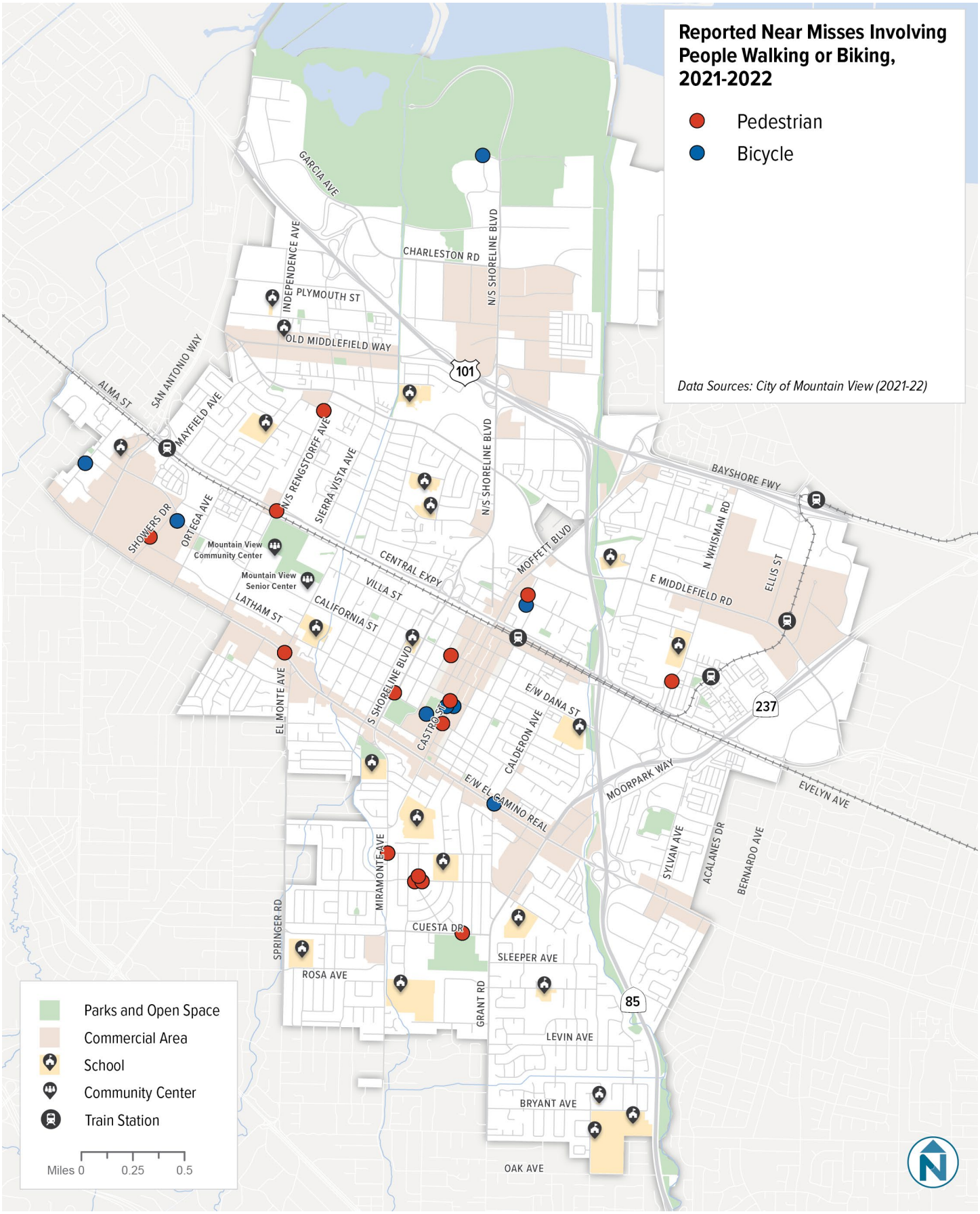


Figure 22 Collisions Involving People Walking by Severity of Injury and Challenging Locations

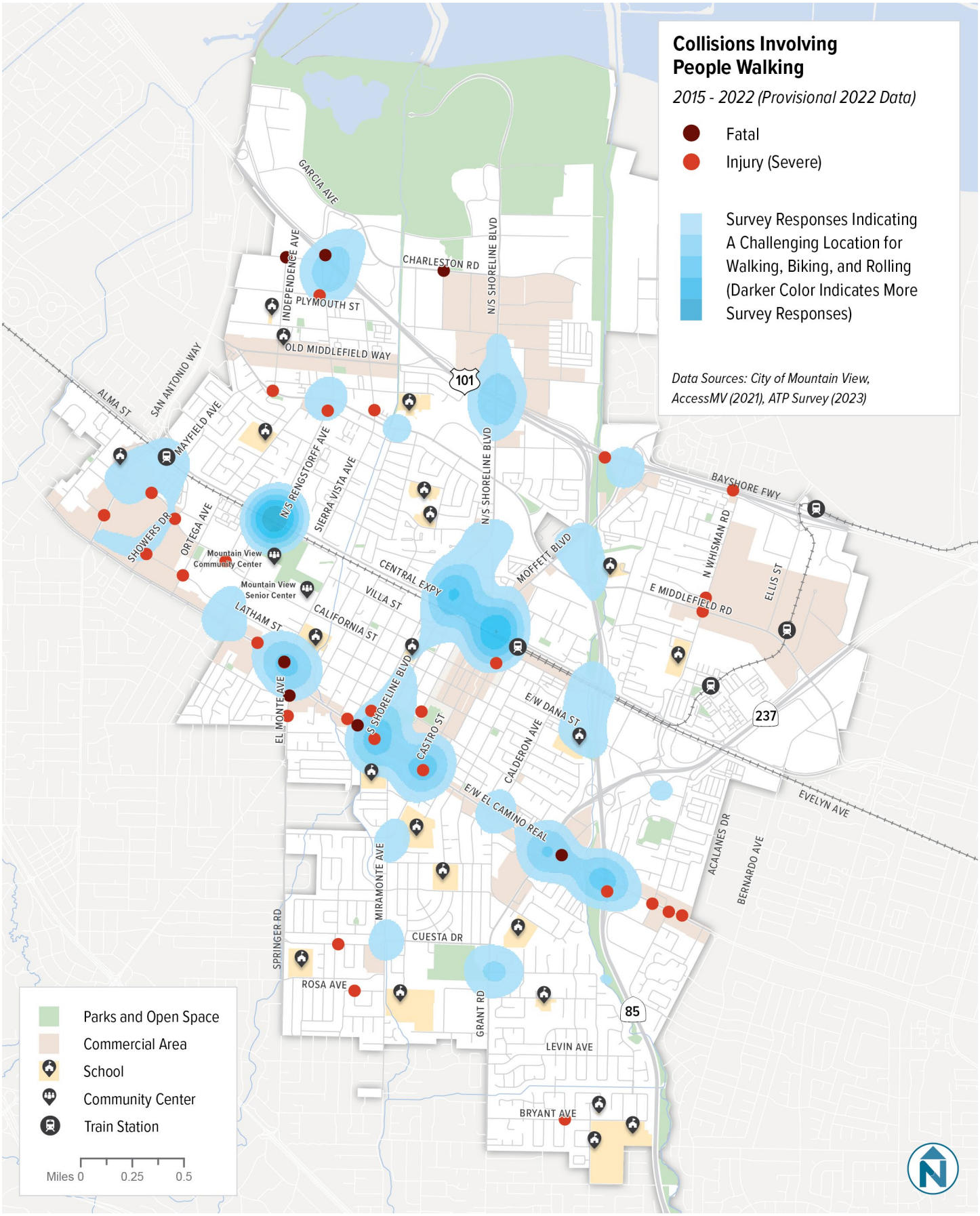


Figure 23 Collisions Involving People on Bikes by Severity of Injury and Challenging Locations

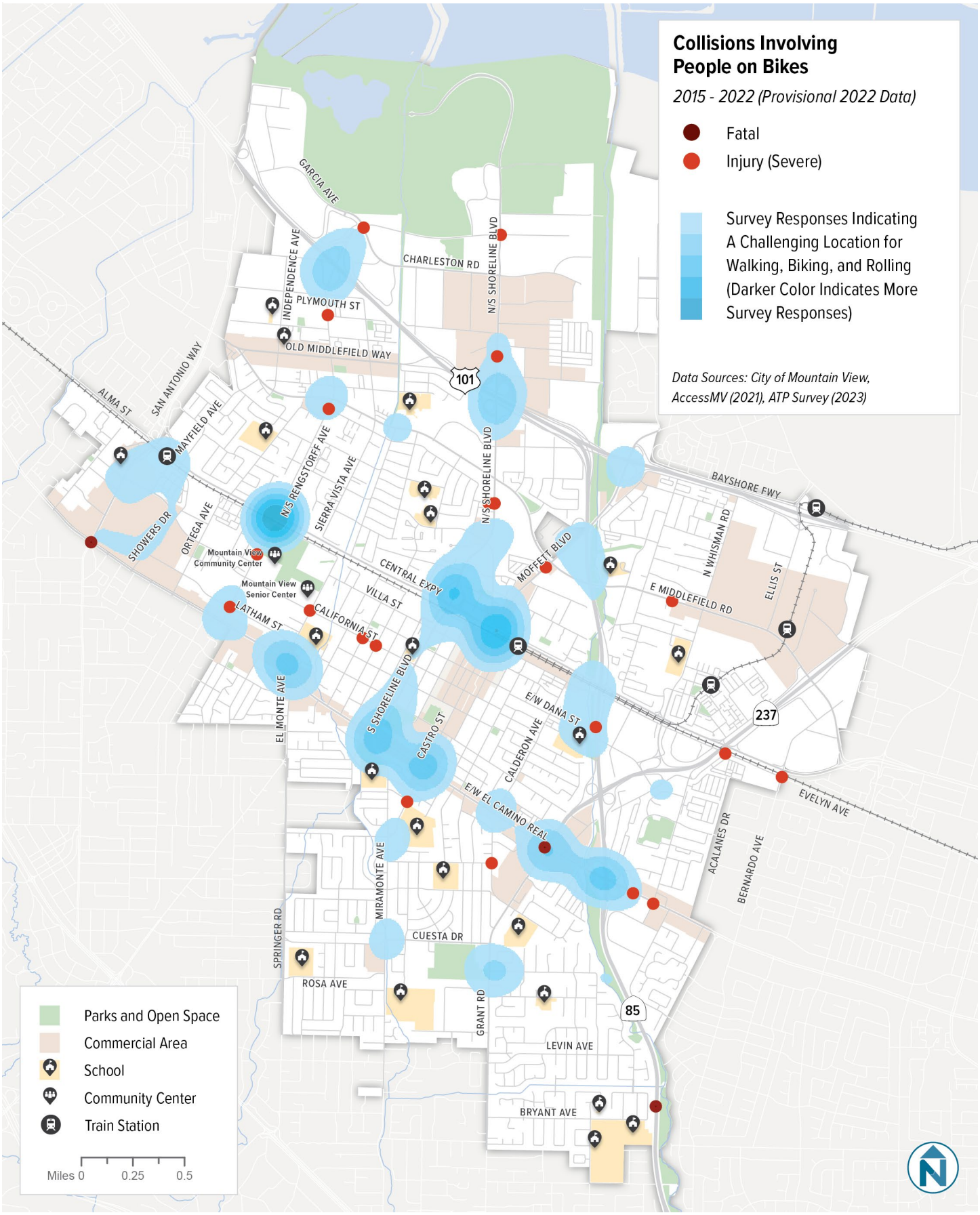


Figure 24 Frequency of Collisions Involving People on Bikes and Challenging Locations

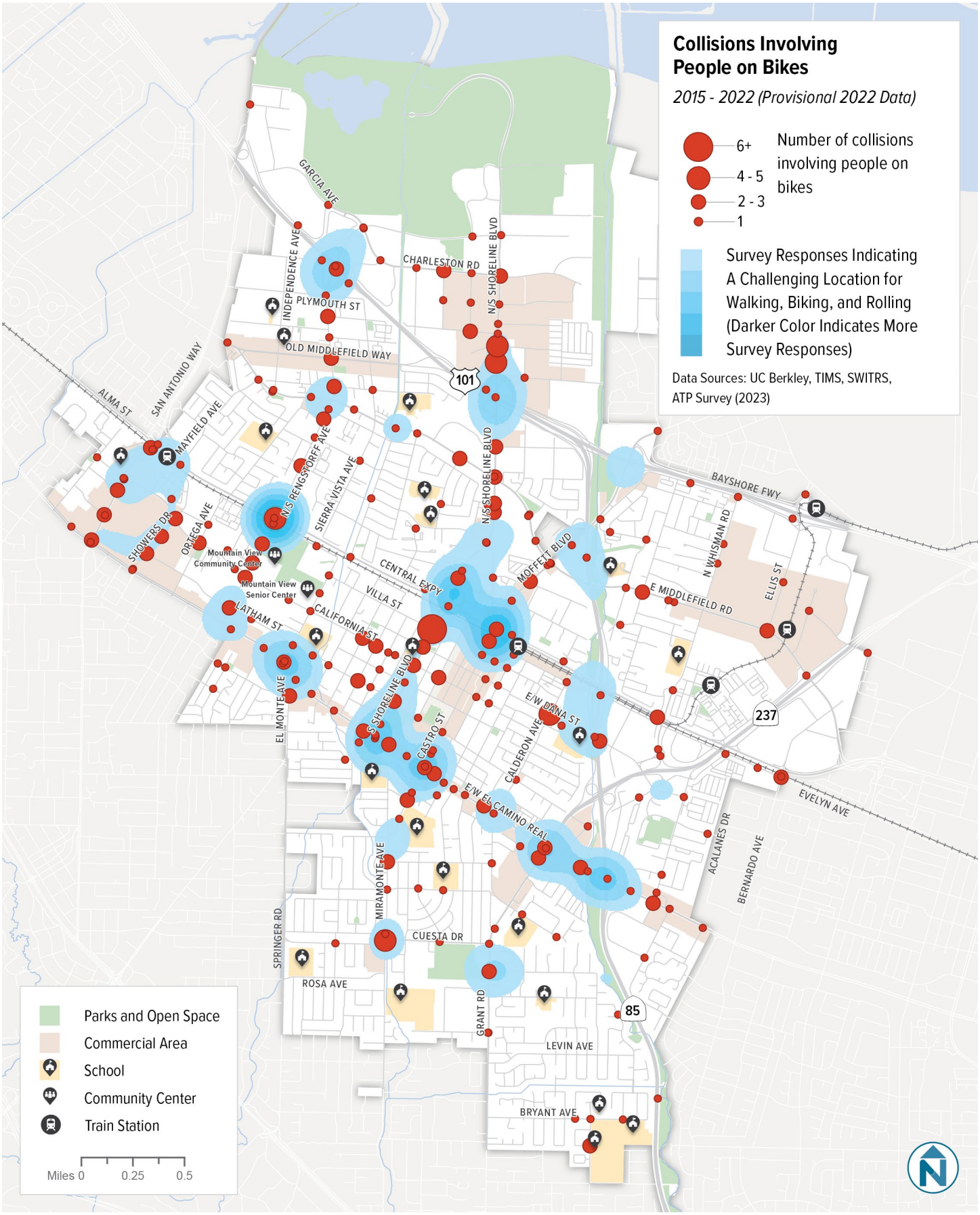
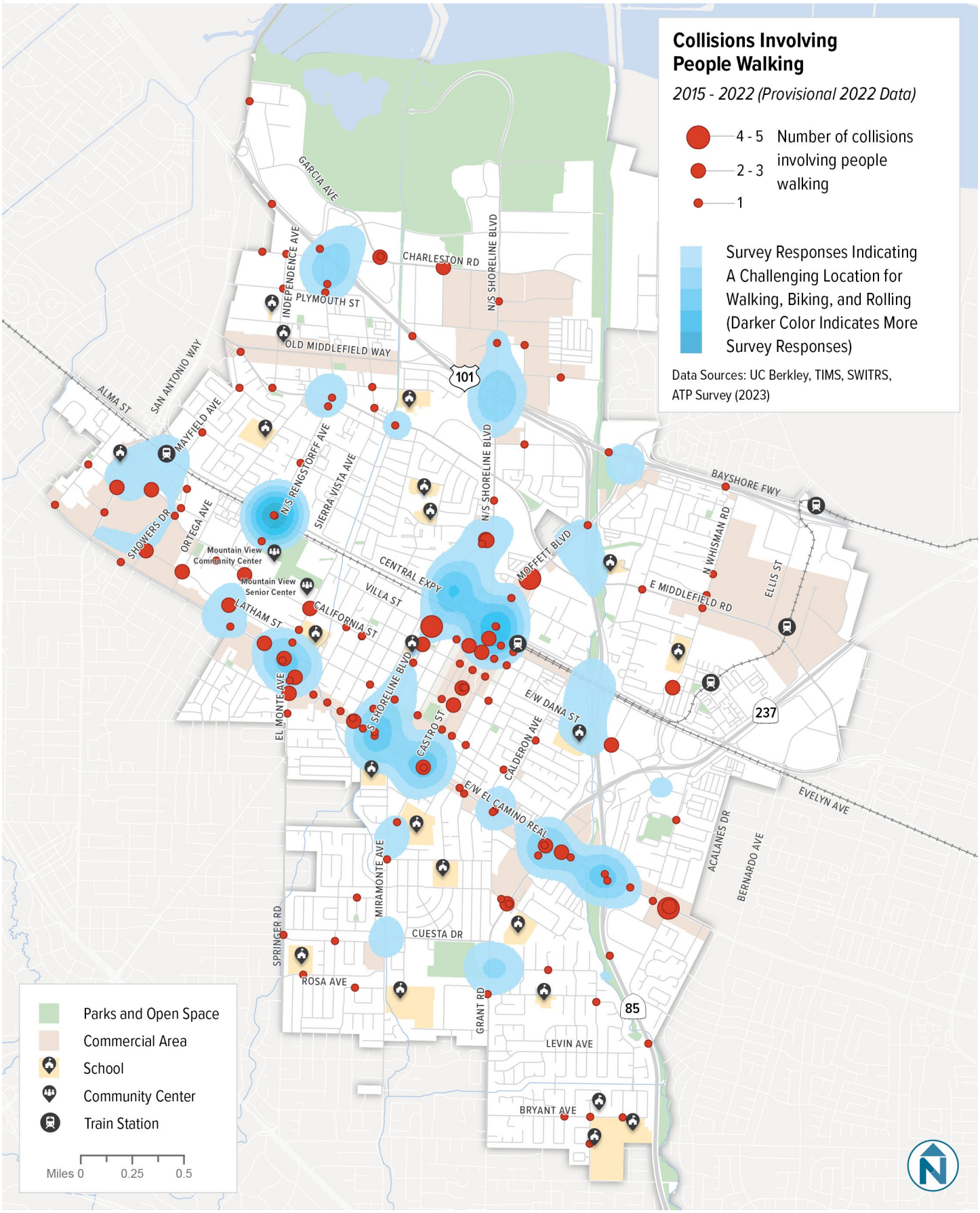


Figure 25 Frequency of Collisions Involving People Walking and Challenging Locations



Sidewalk and Roadway Conditions

Even where pedestrians and bicyclists are separated from vehicles and supported by some level of active transportation infrastructure design, sidewalk and roadway conditions can create uncomfortable walking, biking and rolling conditions which may also be associated with higher collision risk.

Throughout the City, survey respondents identified locations where uneven or bumpy pavement creates tripping hazards for pedestrians or safety challenges for bicyclists. Bumpy locations included marked crosswalks, sidewalks, curb ramps, and places where road, path, or sidewalk paving transitions from one material to another.

For people who walk, curb edges, abrupt driveway transitions, and driveway lips can pose safety challenges for tripping or crashing (Figure 26). Through survey responses and walk tour conversations, community members described many locations where they have encountered unexpected or difficult-to-see curb edges and driveway lips, including neighborhoods near schools and senior facilities. While rolled curbs can address issues with driveways interrupting the sidewalk, they also allow motorists to easily park on the sidewalk, often blocking the use of the sidewalk by people of all ability levels. Lastly, several neighborhoods in Mountain View have numerous driveways along the road segment, creating numerous potential conflict points between pedestrians and vehicles.

Also highlighted in Figure 26, leaves, dirt, and other debris on sidewalks and bike lanes can transform otherwise well-designed facilities into safety hazards for people who walk, bike, or roll. Drainage problems can leave silt and sand on sidewalks and roadway edges and require regular maintenance to clean or remove. Some survey respondents noted that gravel can pose a concern for turning bicyclists, potentially leading to crashes or injury.

Code Review Findings: Sidewalk Conditions and Accessibility

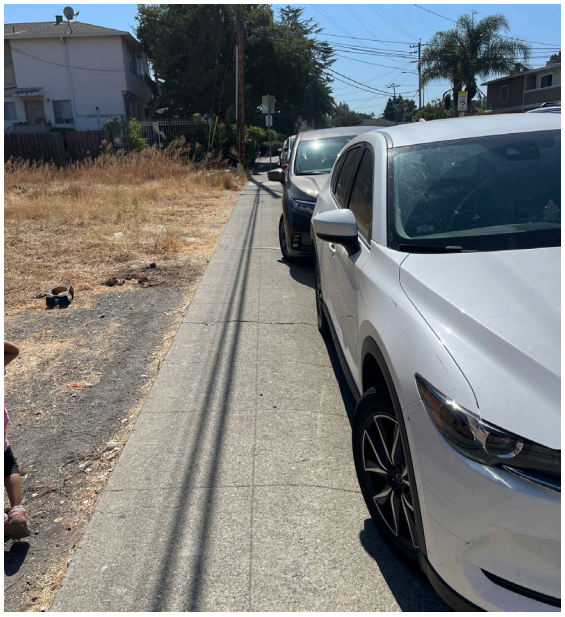
Standard Details A-1 through A-9 define typical street cross sections.

- *These are used as a starting point for the elements that make up a street width (e.g., travel lanes, bike lanes, sidewalks) but the current standards do not reflect streets that support active transportation for all ages and abilities. Engagement responses noted the narrow sidewalks, sidewalk cracks and upheavals, and narrow bike lanes.*

Standard Detail A-8 shows the driveway slope beginning within the width of the sidewalk.

Several walk tour attendees noted the slope of driveways in attached sidewalks as being difficult for people using mobility devices or who are unstable on their feet.

Figure 26 Example of a Rolled Curb and a Curb-Impacted Bike Lane in Mountain View



The rolled curb on this sidewalk allows people to park on the sidewalk.

The placement of this joint in the middle of the bike lane increases crash risk and increases stress, reducing bicycle ridership.

Roadway Crossings, Signals, and Visibility

Crossing vehicular roadways, especially those with fast-moving traffic and multiple lanes, was a recurring comfort and safety challenge as indicated by community members. While the City continues to improve and enhance crossings and intersections with features that support pedestrian and bicycle safety, such as high visibility crosswalks, raised crosswalks, RRFBs, PHBs, and "daylighting" or removing visual barriers near intersections to improve visibility (Figure 27), some community members expressed that driver behavior continues to create challenges for safe crossings—especially across larger arterial roads such as El Camino Real and Central Expressway. As seen in Figure 28, both of those roadways currently lack enhanced pedestrian crossing infrastructure, though the previously mentioned project on El Camino Real that begin in spring 2024 will bring some improvements along this roadway.

In contrast, the North Bayshore area has several pedestrian signals and enhanced crosswalks.

Some survey respondents highlighted that shade is limited in some areas where there are long waits at signalized intersections.

Lastly, some survey respondents encountered visibility challenges between bicyclists and vehicles while entering or existing trails in Mountain View. Dense foliage, trailhead configurations, and vehicle speeds were noted as potential contributing factors to these visibility challenges.

Code Review Findings: Roadway Crossings, Signals, and Visibility

Standard Detail E-11 includes only detection loops in the pavement.

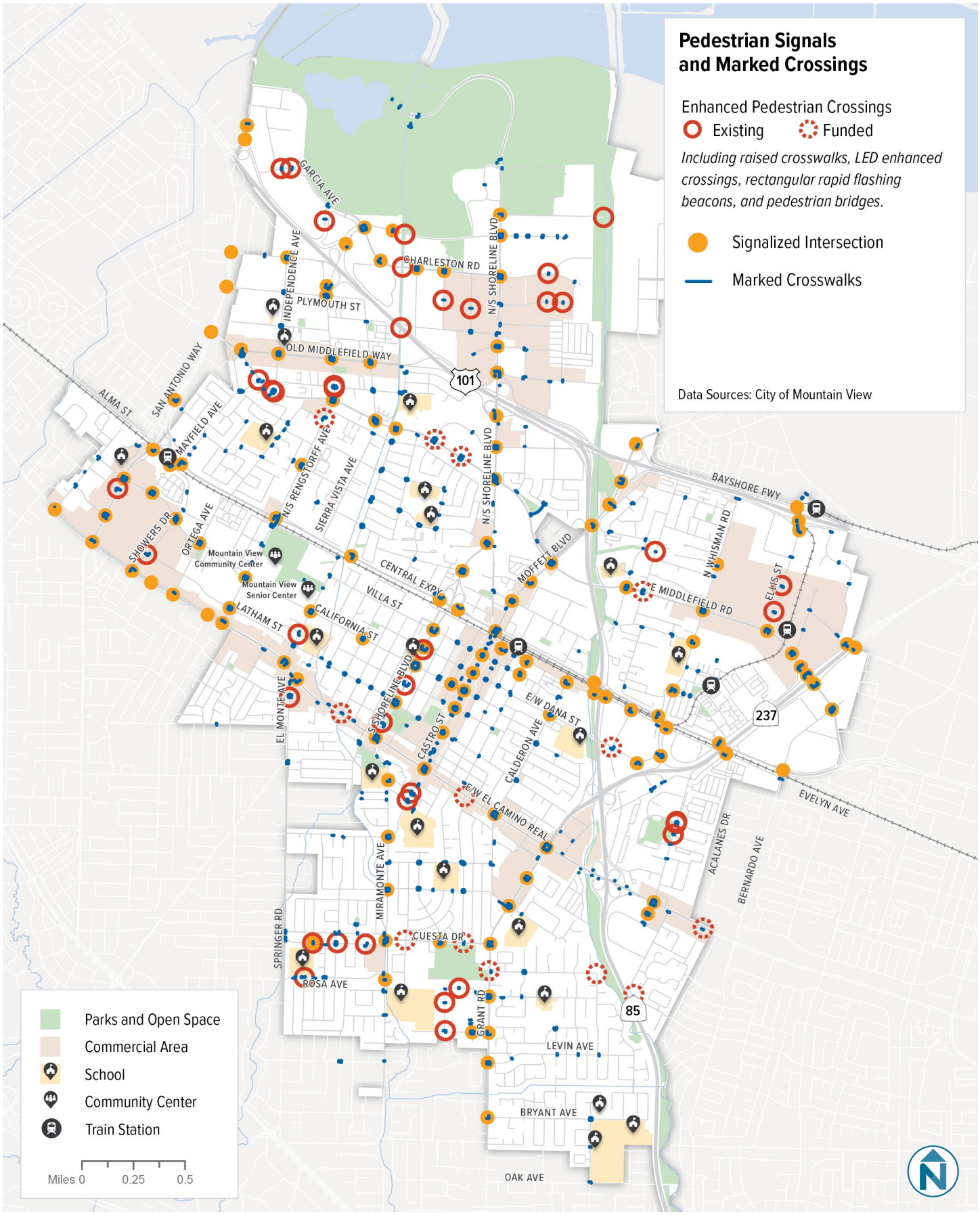
These are often unreliable at detecting bicycles. Unreliable detection encourages unsafe behavior as well as being frustrating to people biking.

Figure 27 Examples of Enhanced and Marked Crossings in Mountain View

This Rectangular Rapid Flashing Beacon (RRFB) allows safe crossings near Mistral Elementary

Marked crosswalks can help motorists anticipate the presence of people walking and biking at intersections.

Figure 28 Marked Crossings, Signalized Intersections, and Enhanced Intersections



Land Use and Urban Design Considerations

Through the ATP survey and other engagement conversations, many community members highlighted how land use and urban design can impact safety and comfort for walking, biking, and rolling. The ATP, which will primarily identify policy and capital projects to improve biking, walking, and green streets in Mountain View, it will not be able to directly address some of these aspects. Nonetheless, the ATP provides an opportunity to highlight the important nexus between land use, urban design, and active transportation pointing towards potential policy solutions that the City can consider through future planning efforts. For example, in some parts of Mountain View, the shape and limited connectivity of the street network leads to lengthy pedestrian and bicycle routes to destinations that are relatively close (Figure 7 and Figure 12). During the ATP process, treatments such as mid-block crossings and paseos that can reduce pedestrian and bicycle travel times can be considered.

Survey respondents and community conversation participants frequently identified vibrant, walkable shopping areas such as downtown and the San Antonio Shopping Center as favorite places for safe and comfortable walking. As part of the AccessMV study (2021), the City analyzed Pedestrian Quality of Service (PQOS), which highlighted the impacts of the land use mix on the pedestrian experience, by utilizing WalkScore (TM) data, which prioritizes connections to certain business types and community assets. Although the ATP will not update or revisit this analysis, those findings will be considered during the development of policy recommendations.

Figure 29 Examples of Urban Design Impacts on Walking and Rolling in Mountain View

Some streets in Mountain View, including parts of California Street (left) and Rengstorff Avenue (right), have long blocks, numerous driveways, and large building setbacks, all of which can make walking less comfortable or enjoyable.

4. ACCESS AND EQUITY

For many, biking, walking, and rolling are essential transportation options for meeting daily travel needs. Equitable access to key destinations can remain challenging even in neighborhoods with a complete and connected pedestrian and bicycle network. An accessible and equitable active transportation network must connect people with critical services and destinations and be designed to reflect the different needs, abilities, and levels of experience for different people who walk, bike or roll.

Different active transportation improvements will be needed to address different types of mobility needs for different types of people in Mountain View. The same routes, facilities, and crossings that are easily navigable for some people can be stressful or inaccessible for others.

Equitable Access to Destinations and Services

In some parts of Mountain View, pedestrian and bicycle facilities are limited where mobility needs are high (Figure 14). Gaps in the active transportation network in these areas can make biking, walking, or rolling more challenging for those who rely on them the most.

As noted in the section on Mobility and Connectivity, several neighborhoods in southeast Mountain View are home to a higher proportion of zero-vehicle households and lower-income residents compared with other parts of the city. In some of these areas, the sidewalk network is incomplete and AAA bicycle facilities are limited (Figure 7 and Figure 14). In other areas of the city, sidewalks that are uplifted by tree roots, sloped due to abrupt driveways or obstructed by utility poles, signage or street furniture make it challenging to travel with strollers and mobility devices. Young children are aware of the design elements as much as adults when walking. One of the younger participants on the walking tour noted that shade was lacking on the walk and that it was important (Figure 30).

Mountain View has higher rates of walking and bicycling to work (3.2% and 5.6% respectively) compared to many neighboring cities (Sunnyvale, Cupertino, and Santa Clara) as well as the county, state and national rates (Table 8). Some peer cities including Palo Alto and Davis have higher rates of walking and/or biking to work than Mountain View (Table 8).

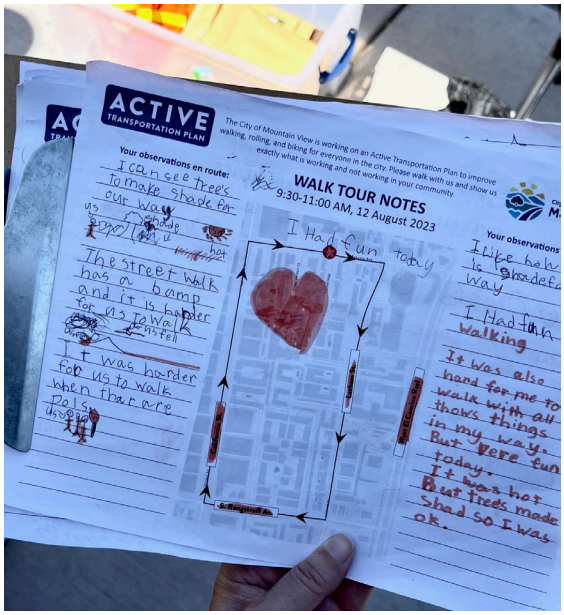
The existing and funded AAA network in Mountain View connects to many of the city's major employers and areas of high job density. Areas of lower-density employment, such as along the commercial corridors, where lower-paying jobs are typically located, are not as well served by the AAA network (Figure 31). The sidewalk network is more prevalent in the city to support walking to work; however, as noted earlier, gaps do exist, particularly in neighborhoods in the southern section of the city (Figure 32).

Table 8 Commute Mode Share in Mountain View and Peer Cities (2021)

	Total Workers (Age 16+)	Drove alone	Carpooled	Public transit	Walked	Bicycle	Taxicab, motorcycle, or other	Worked from home
Mountain View	44,414	53.20%	4.50%	2.10%	3.20%	5.60%	1.20%	30.20%
Sunnyvale	87,798	61.6%	9.1%	5.1%	1.6%	1.6%	1.5%	19.6%
Cupertino	27,965	67.7%	5.8%	1.8%	2.8%	0.5%	1.4%	20.0%
Santa Clara (City)	69,840	58.2%	5.7%	2.2%	2.5%	0.9%	2.3%	28.3%
Palo Alto	33,763	46.10%	2.40%	1.60%	6.40%	9.20%	1.70%	32.60%
Davis	31,129	51.90%	5.20%	7.10%	3.00%	13.80%	1.00%	17.90%
Santa Clara County	967,786	59.3%	8.9%	2.1%	2.0%	1.5%	1.5%	24.8%
California	18,283,118	70.10%	9.60%	4.10%	2.40%	0.80%	1.60%	11.40%
United States	160,577,736	73.20%	8.60%	4.20%	2.50%	0.50%	1.40%	9.70%

Source: ACS 2021 5 Year Estimate

Figure 30 Examples of Youth Perspectives on Opportunities and Challenges for Walking, Biking, and Rolling in Mountain View



This child's walk audit highlights the creativity and interest children have in their built environment.

Buckled sidewalk like this is a tripping hazard for everyone, especially young children.

Figure 31 Job Locations and Bicycle Access

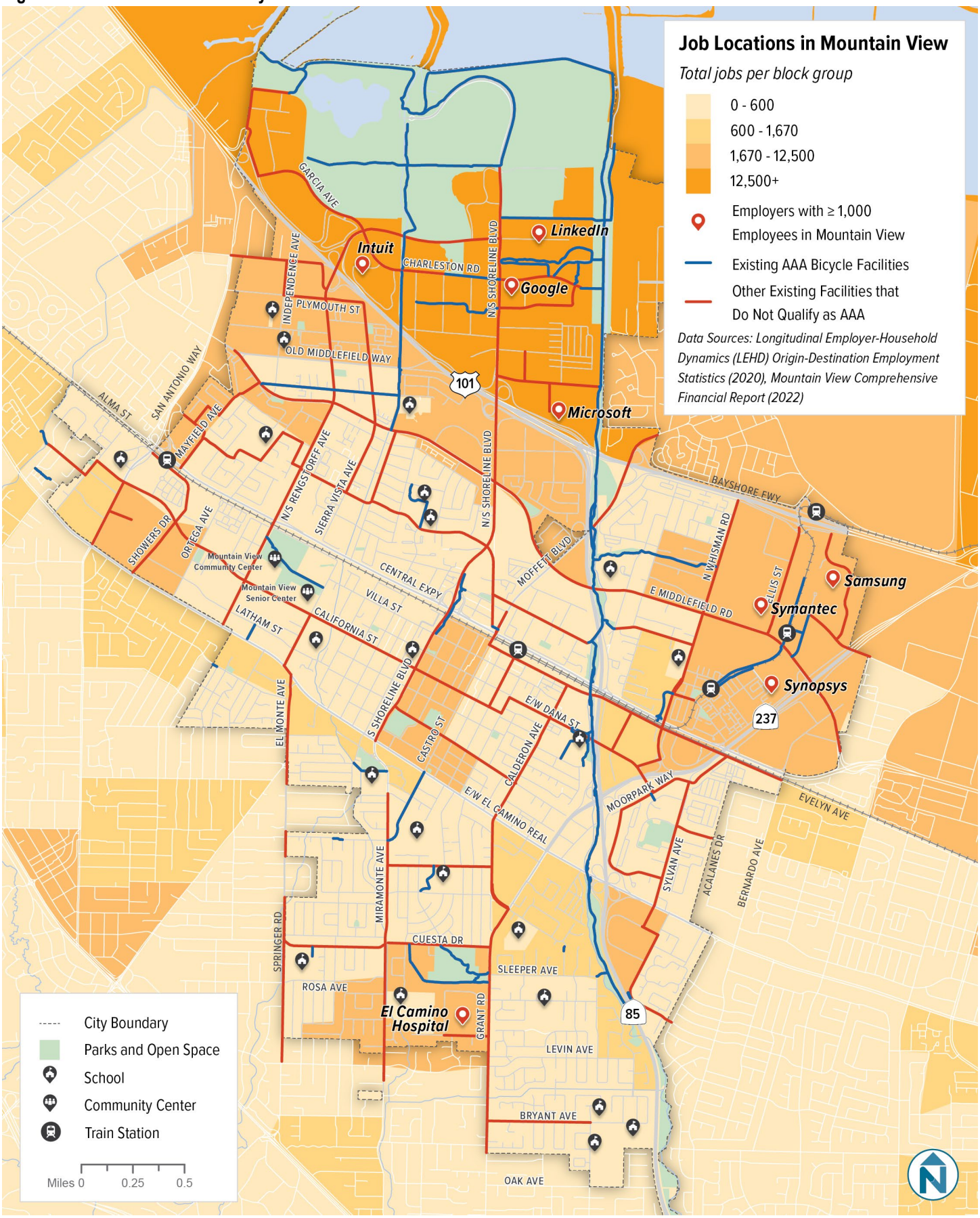
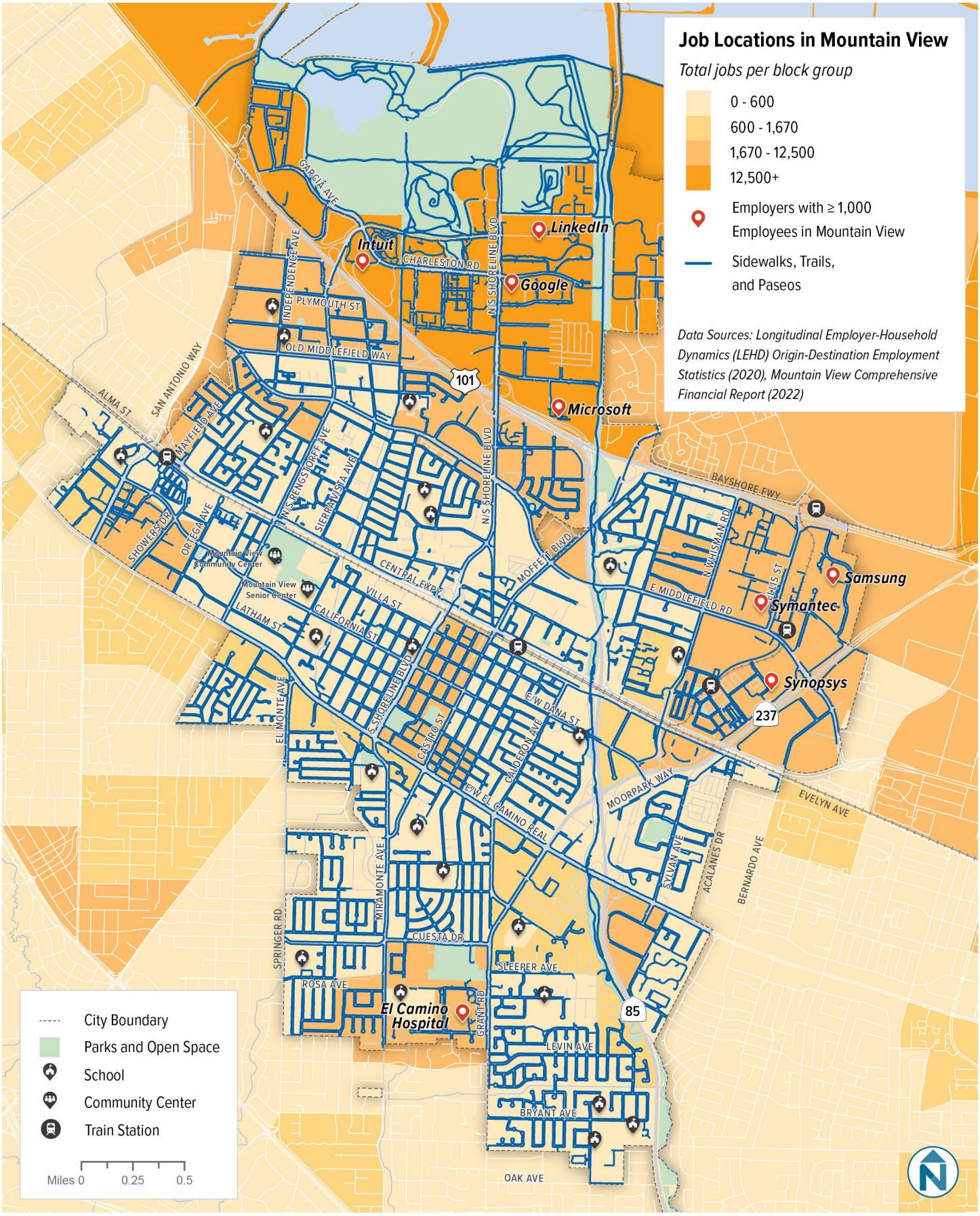


Figure 32 Job Locations and Pedestrian Access



Equitable Access to Transit

Pedestrian and bicycle access to transit in Mountain View is mixed. Fixed-route transit services in the City include VTA light rail, Caltrain service, VTA bus service, and Mountain View shuttle service. While some community members have reliable pedestrian and bicycle access to these services, others report encountering challenges or barriers to access.

VTA light rail station areas like Whisman Station are well connected by a complete sidewalk network and low-stress bicycle routes. In some areas, such as Pacific Drive near Whisman station, station area planning has helped create walkable, shaded streets that improve transit access for people who walk, bike, and roll. Some survey respondents identified access to a transit stop or station as a favorite destination for walking, biking, and rolling, especially the downtown transit center and other rail stations. Other respondents reported challenges getting to and from transit, especially bus stops on busy roadways where safe or marked crossings are few and far between (Figure 33).

In most of the city, bus services on major roads and arterials are connected to adjacent neighborhoods via low-stress bicycle and pedestrian routes. However, most major roads and arterials (on which buses operate) are more stressful for bicyclists and pedestrians, making the first and the last mile access more complicated and increasing crash risk for riders. Some of the highest transit ridership in Mountain View occurs along El Camino Real, which is not a comfortable environment for many pedestrians or bicyclists, has long block lengths and crossings, and sees a higher concentration of crashes involving these modes (Figure 34).

Figure 33 Examples of Transit Access Conditions in Mountain View

The Mountain View Transit Center will undergo a transformative project to create better access for all users.

This bus stop is not an inviting place for transit users due to its proximity to moving traffic, poles in the middle of the walking space and the cracked sidewalk.

Figure 34 Transit Ridership and Bicycle Access

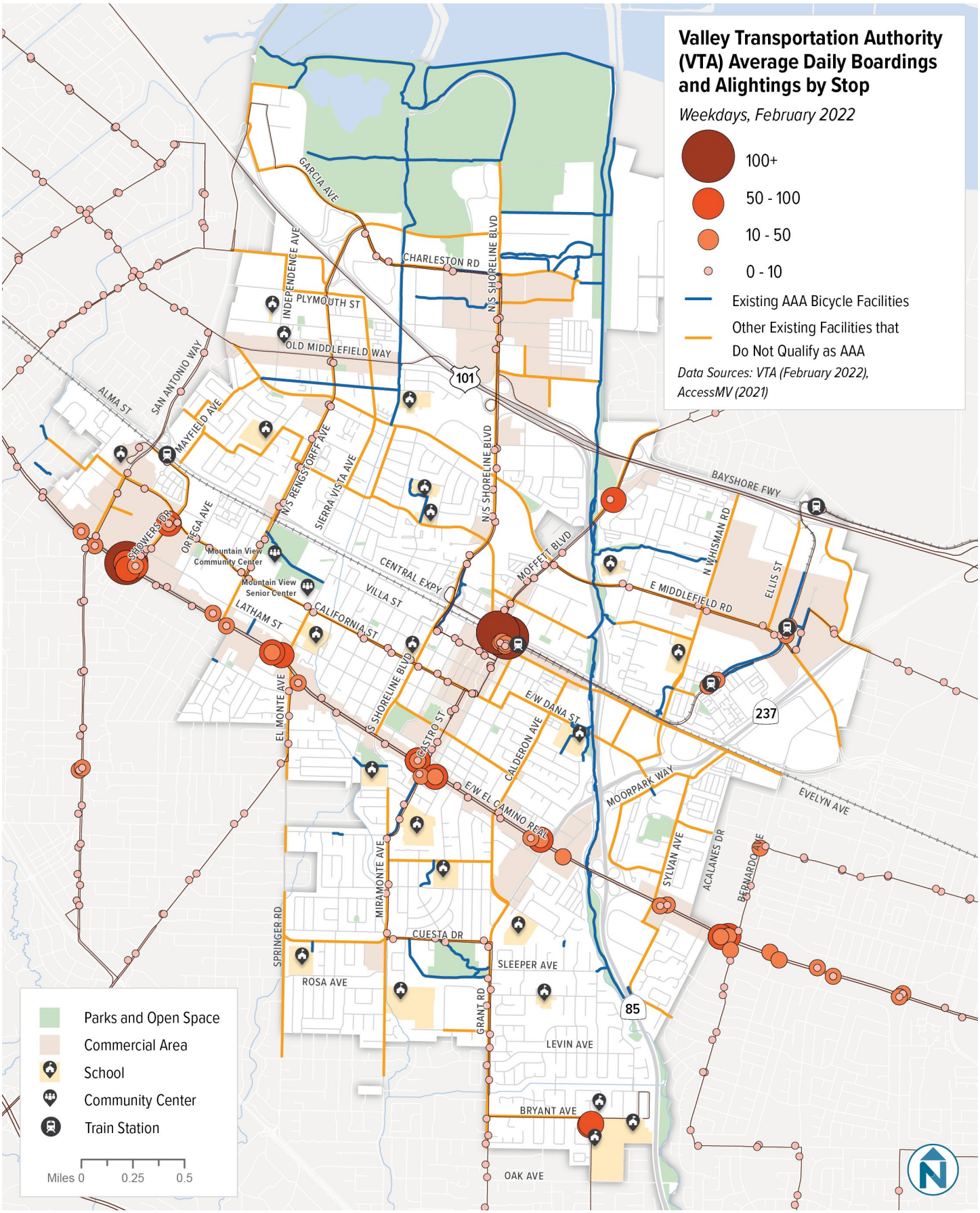
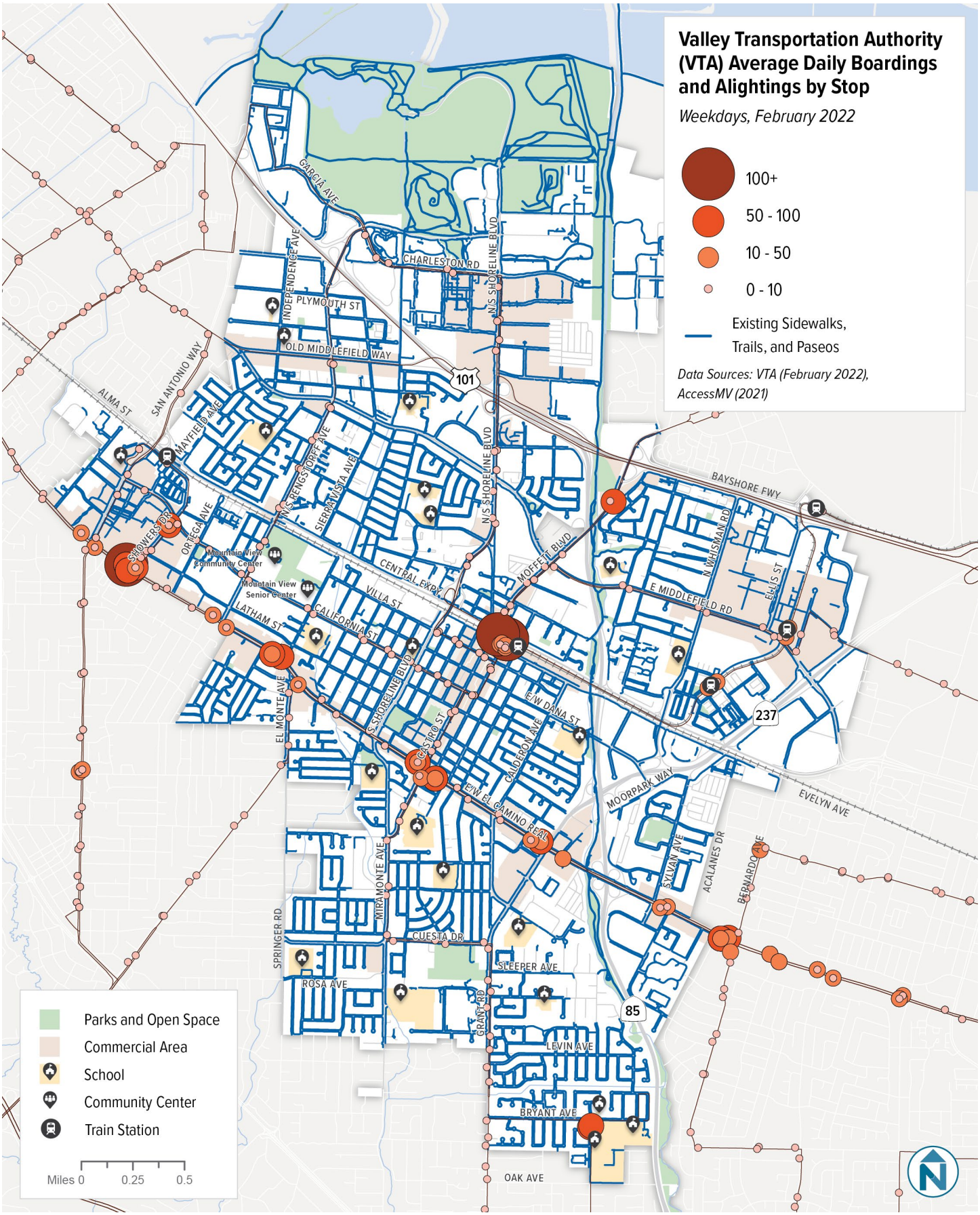


Figure 35 Transit Ridership and Pedestrian Access



5. SUSTAINABILITY AND BIODIVERSITY

Defining Biodiversity

Biodiversity refers to the variety of living organisms on Earth.

California and the Bay Area are global biodiversity hotspots because they contain a high number of native species including plants, animals, birds, bacteria, fungi and insects that are found nowhere else in the world! These species do not just live in wilderness areas a long way away from cities; they also include native plants that grow (or could grow) along public streets, trails and parks, as well as the birds, insects and other living organism that depend upon these plants.

Native plants evolved to thrive in the soils, moisture and changing weather conditions of this region over millions of years. They therefore require less supplemental watering and pest control than many non-native species and may not perform as well with watering regimes designed for other species.

Additionally, native species also coevolved to have specific symbiotic relationships with other living organisms. For example, dwarf plantain (Plantago erecta) is the primary host plant to the endangered Bay Checkerspot Butterfly; showy milkweed (Asclepias speciosa) is a host plant for the Monarch Butterfly; and Coast Live Oak (Quercus agrifolia) is a keystone species which serves many other species within the ecosystem.

In areas like Mountain View, a loss of biodiversity is associated with many factors including habitat destruction, degradation or fragmentation for development, introduction of invasive species, non-native species, monoculture, pollution, biocides, and climate change. The consequences these factors can result in extirpation or even extinction of species, which can have cascading effects on the wider ecosystem.

In 2021, the Mountain View City Council established a goal to "protect and enhance local ecosystems and biodiversity through rewilding and other measures" as part of their Sustainability & Climate Resiliency strategic priority. The City is now undertaking a biodiversity strategy to enhance the health of local ecosystems and prevent species loss through a multi-pronged approach. One element of this approach is planning for active transportation networks that double as habitat corridors to preserve biodiversity assets, create new spaces for local native plants, and support local ecosystems.

Defining Green Streets

Green Streets are streets that provide space for natural elements to support biodiversity, incorporate sustainable stormwater strategies, slow motor vehicle traffic, and prioritize active transportation modes (biking, walking, rolling) for people of all ages and abilities. Green

streets are a holistic approach that combines active transportation, biodiversity promotion, and green infrastructure development. Simply put,

Green Streets = Active Transportation + Biodiversity + Green Infrastructure.

Green streets are an important component within the active transportation system and can provide access to recreation, nature and open spaces through green treatments that are integrated into the street. They present a unique opportunity to support Mountain View's sustainability and biodiversity goals by providing space for natural systems to thrive within the public right-of-way. Green streets influence how people use the street, often slowing motor vehicle traffic and increasing the comfort of pedestrians and cyclists by creating space and incorporating natural elements into the street.

Benefits of Green Streets

- Green stormwater infrastructure is required as part of all roadwork projects for the City to comply with the Municipal Regional Stormwater Permit 3.0.
- Green streets support active transportation by creating healthy settings where people want to walk and bike, fostering social connections and an active lifestyle.
- Trees, vegetation and green stormwater infrastructure provide and complement traffic-calming efforts, contributing to safer streets by slowing vehicular traffic.
- Green street features make public spaces more attractive and comfortable for people through shade, heat absorption, visual vibrancy and clear local identity.
- Street trees and impermeable surfaces reduce heat island effects, making streets cooler and safer during heat events, and mitigating impacts of climate change.
- Green stormwater infrastructure and plants manage stormwater by increasing pervious surfaces, reducing, slowing and treating runoff, and improving water quality.
- Green streets enhance air quality by filtering out pollutants.
- Green streets with native species provide habitat corridors that support survival of native plants, pollinators and ecosystems in this region which is a biodiversity hotspot.

Challenges of Green Streets

Green streets also come with various potential challenges, which can be reduced or eliminated by selecting the right tree for the right place and by timely, species-appropriate maintenance. The following potential challenges should be considered when designing a green street.

- Tree roots can potentially lift sidewalks, creating uneven walking surfaces, which can be a potential tripping hazard or change the slope of the sidewalk.
- Property owners may incur costs related to planting strip maintenance and care.
- Certain trees and plants may be perceived as messier than others, dropping leaves, nuts, and fruits on the ground and creating potential tripping hazards.

- Vegetation may trigger seasonal allergies especially when only male trees or plants are planted in order to avoid seeds, pods and fruit.
- Trees can be susceptible to storm damage, dropping debris and limbs, or falling over completely during large storm events.
- Vertical elements (like trees and inappropriately selected shrubs) in the right-of-way may impede the visibility of drivers, pedestrians, and cyclists. This challenge is further discussed in the Street Trees and Site Triangles subsection.

Below is a quick reference to the benefits and challenges of green streets.

Table 9 Green Streets Benefits and Challenges

Benefits	Challenges
Encourages walking and biking	Can produce tripping hazard, sidewalk lifting
Fosters social connections and community	Can incur cost to the property owner
Enhances air quality, filters air pollutants	Can produce debris such as leaves, nuts, fruit
Reduces temperatures, keeps streets cool	Requires maintenance
Reduces stormwater runoff and water pollution	Can exacerbate seasonal allergies
Slows vehicles, calms traffic calming	Can result in property damage if limbs fall
Increases property values for property owners	Can reduce visibility in right of way
Provides habitat for wildlife and pollinators	
Provides beauty, seasonal interest, mental health benefits	
Helps people conserve energy	
Required for compliance with MRP 3.0	

Mountain View's Urban Forest

Trees are a valuable community resource and an essential component of civic infrastructure. The City of Mountain View has been committed to preserving and enhancing its urban forest since 1960 when the City Council established tree care services.

Commitment to the Urban Forest

The City of Mountain View boasts a history of dedication to preserving and enhancing its urban forest, spanning several decades. This commitment is evidenced by a series of pivotal milestones:

- 1961 - Enactment of the Street Tree Ordinance
- 1975 - Adoption of the Heritage Tree Ordinance
- 1983 - Introduction of the First Street Tree Policy and Reforestation Plan

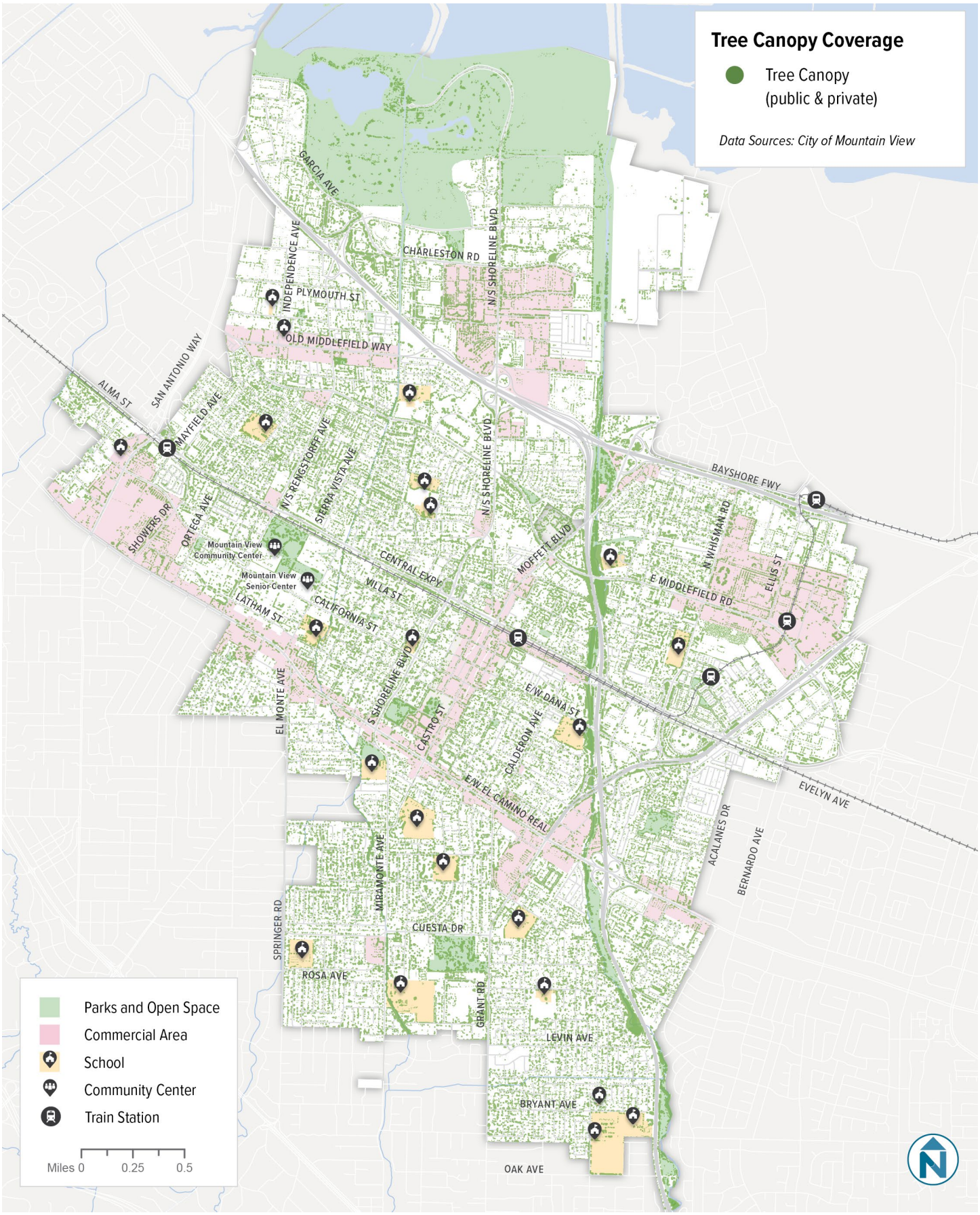
- 1993 - Establishment of the Urban Forestry Management Plan
- 2001 - Recognition of Mountain View as a Tree City USA
- 2013-2015 - City Council goals to improve the urban forest and preserve habitat
- 2015 - Launch of the Community Tree Master Plan (CTMP)
- 2021 - City Council Strategic Priority to develop a Biodiversity Strategy
- 2022 - Revision of the Tree Technical Manual
- 2023 - Community engagement on Biodiversity Strategy and Urban Forest Plan

Tree Coverage

According to the 2022 revised *Tree Technical Manual*, Mountain View's existing urban forest currently covers 17.7 percent of the city with tree canopy. To put this in context, this coverage is slightly higher than the California urban area average of 15 percent (according to the USDA Forest Service) and approximately 50 percent lower than adjacent communities directly to the north of Mountain View.

A higher percentage of tree coverage brings substantial benefits, such as filtering out air pollution, reducing stormwater runoff, reducing water pollution, sequestering carbon, reducing urban heat island effects, reducing health risks associated with heat events, contributing to mental and physical health, and increasing climate resilience. In Mountain View, the 2015 Community Tree Master Plan (CTMP) establishes a goal to increase tree coverage to 22.7 percent, representing a 28 percent or 5 percentage point increase. This increase is equivalent to planting an additional 11,000 trees citywide.

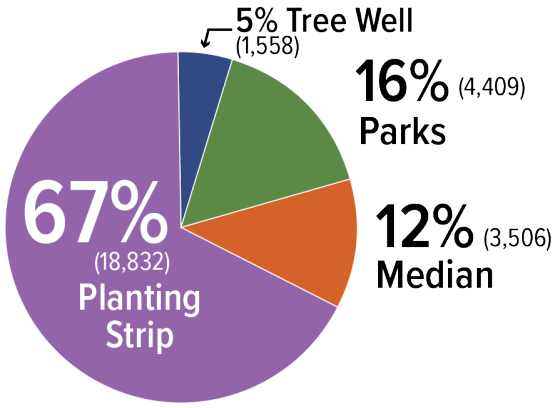
Figure 36 Tree Canopy Coverage



Street Trees in Mountain View

As mentioned previously, Mountain View has a 17 percent tree canopy, with over 28,000 public trees enhancing the City's natural beauty. These trees are cataloged in the City's Urban Forest GIS database, encompassing attributes such as common name, species, tree group (deciduous, evergreen, palm), trunk diameter, circumference, planting type (the type of public land where the tree was planted), heritage designation, and ownership and maintenance data. According to the *Tree Technical Manual*, a significant portion of all urban trees–approximately 25%–line city streets. Based on this report's focus on active transportation and green streets, the data below provides a quick snapshot of public trees, with a focus on street trees, specifically.

Figure 37 Public Tree Planting Types



Approximately 2/3 of public trees are located in planting strips. Planting strips along the street represent the biggest opportunity to plant additional community trees.

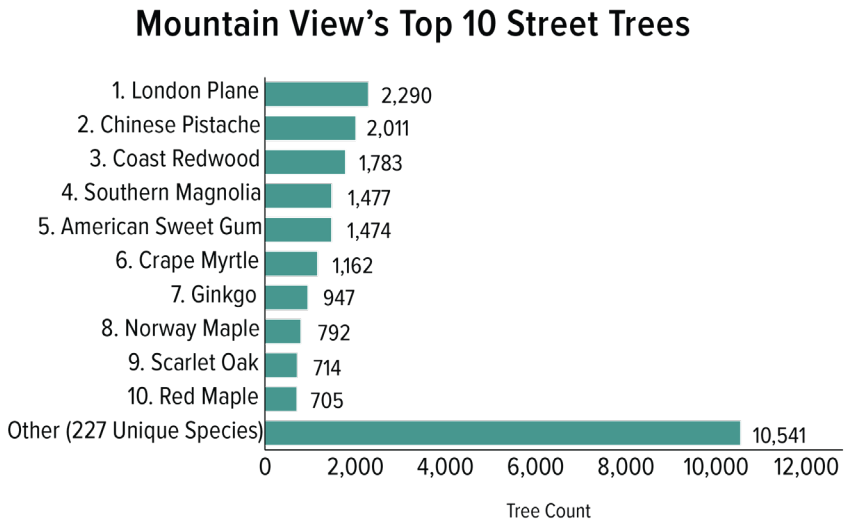
In addition to efforts to increase permeable space and reduce the use of biocides, Mountain View's commitment to biodiversity requires a shift away from monocultural planting, which is more susceptible to diseases, and a focus on native plant species needed to support local pollinators and ecosystems.

In relation to monoculture, the City has 237 unique species of street trees, ranging from large shade trees to small ornamental trees, palms, to evergreens. While this seems like a lot of species, there are 6,000 species endemic to California. Historically, the City planted a single tree species along each street in order to create a unified aesthetic for the neighborhood. While the City is shifting away from this type of monocultural planting, the legacy of single species planting creates ongoing vulnerabilities in terms of plant health.

In relation to the focus on native species, Figure 39 below lists the top 10 most common street trees found in Mountain View. Of this list, only one species, Coast Redwood (Sequoia

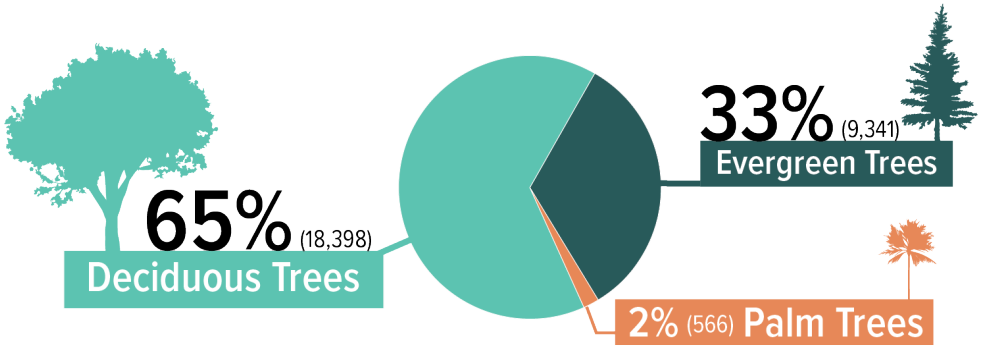
sempervirens) is native to California. For other types of plants—such as shrubs, forbs (herbaceous plants) and grasses—that are planted in public rights of way there is a similar focus on non-native species with more recent shifts toward native species.

Figure 38 - Mountain View's Top 10 Street Trees



Of Mountain View's 10 most common street trees, only the Coast Redwood is native to California.

Figure 39 - Street Tree Count by Type

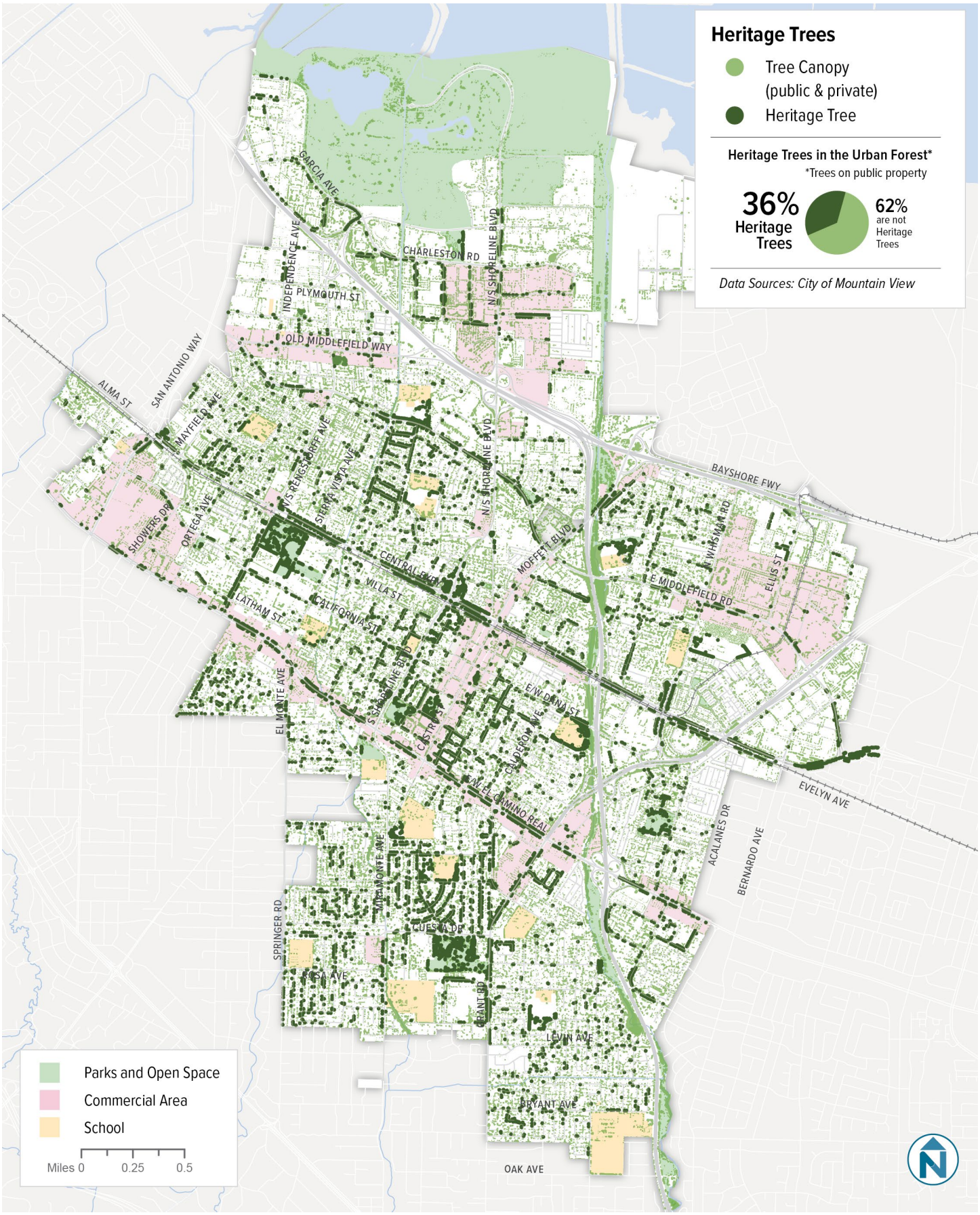


About 2/3 of Mountain View's street trees are deciduous trees.

Heritage Trees

The city has designated 9,297 community trees as heritage trees, and 7,332 are street trees. A "Heritage Tree" is defined as any tree that has a trunk circumference of 48 inches or more measured at fifty-four inches (54") above grade. Three genera, oak (Quercus), redwood (Sequoia), and cedar (Cedrus), are considered Heritage if they have a circumference of 12 inches or more.

Figure 40 Heritage Trees



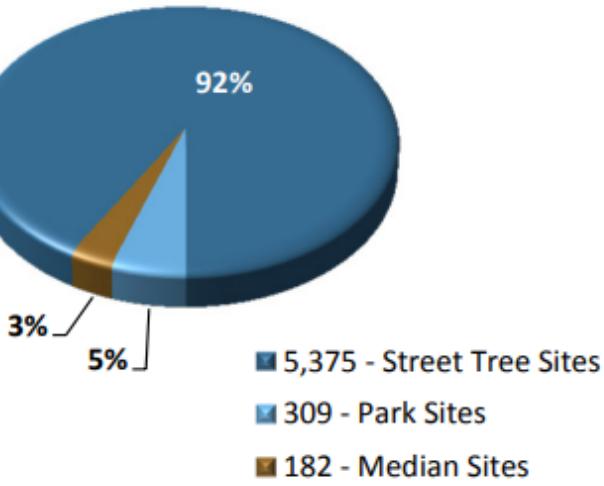
Street Tree Planting and the Urban Forest

The City of Mountain View has made considerable effort in planting and nurturing an urban forest of over 230 unique tree species, with a quarter of all trees lining the streets.

Like many Cities in California, however, most tree and shrub species planted along City streets are non-native species. All street trees provide important shade, cooling, stormwater, water pollution reduction, and air purification services. However, non-native trees and shrubs like London Plane trees, Chinese Pistache, and Ginkgo do not provide the critical biodiversity and habitat benefits of local native species like Coast Live Oak, Valley Oak, Big Leaf Maple, Arroyo Willow, California Laurel, California Buckeye, and Box Elder.

Street tree planting sites represent a significant opportunity for increasing the City's canopy cover and increasing the proportion of local native species. According to the CTMP, street tree planting sites account for 92 percent of vacant planting sites in the City (see Figure 42 Vacant planting sites by location, from the CTMP). Strengthening the City's street tree presence and dramatically increasing the proportion of native species is vital in expanding the urban forest and realizing the city's goal of increasing tree coverage and enhancing biodiversity.

Figure 41 Vacant Planting sites by location



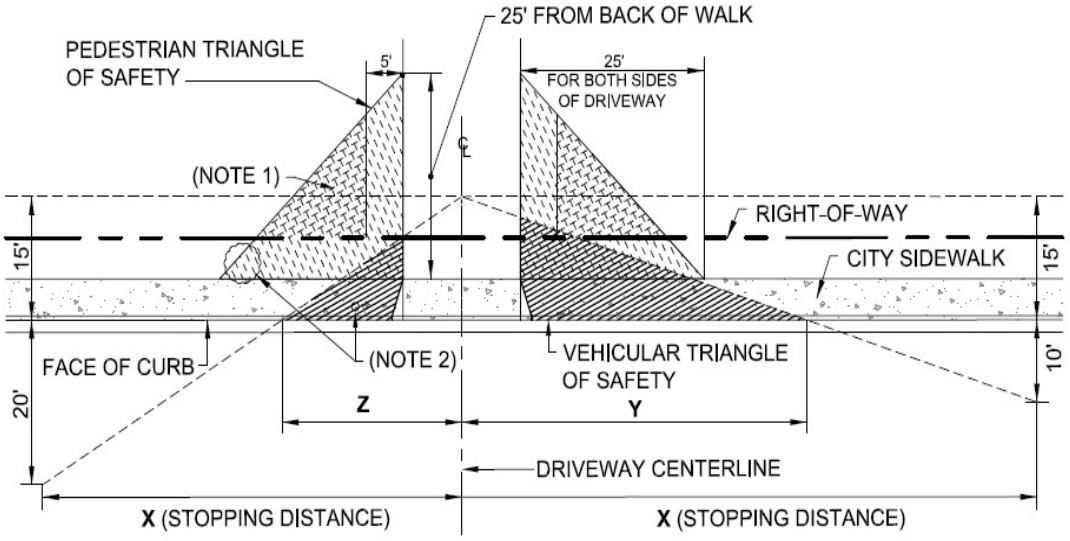
Development Review and Sight Triangles

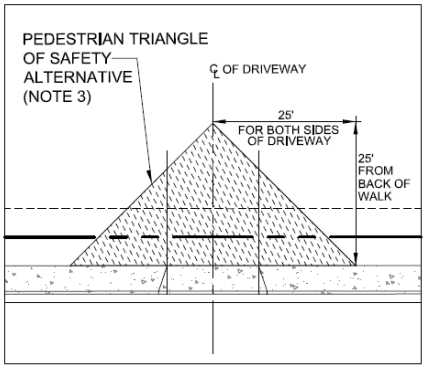
Continuing the exploration of the urban forest and active transportation integrations, addressing the unique challenges faced when designing green streets is crucial. One such challenge involves finding the delicate balance between maintaining clear sight triangles at driveways and increasing the number of trees planted along the street, which mitigate the urban heat island effect, provide biodiversity, and act to slow motor vehicle speeds. This issue

requires careful consideration and context-based solutions prioritizing clear sightlines and the City's commitment to expanding the urban forest.

The City of Mountain View provides several standard details related to street trees and sight triangles. Among these, the Standard Detail A-22 (2019) outlines what are referred to as "triangles of safety" for pedestrians and vehicles, with different details for high- and low-volume conditions.

Figure 42 Sight Triangle Standard Details





A-22 Standard detail includes sight triangles for "high-volume" (above) and "low-volume" conditions (right).

Based on an evaluation of Detail A-22 through a collaboration with students in a Senior Sustainability Seminar at Stanford University, the City's sight triangle has the following potential implications on urban forestry and safety: Firstly, based on a literature review of research on proven pedestrian safety countermeasures as well as a statistical analysis of collisions at driveways in Mountain View, driveway sight triangle issues have little impact on overall crash data and pedestrian safety particularly at low-volume driveways. Additionally, the removal of landscaping has been found to be associated with higher rather than lower crash rates in other study locations. Secondly, based on a GIS analysis of driveways and street trees in Mountain View, the implementation of the City's sight triangle standard outlined in Standard Detail A-22 could theoretically result in the removal of up to 10,758 existing trees, which would reduce the tree canopy. (Please note that the standard detail would only be

applied with redevelopment so this tree removal could only be imposed if each location were to redevelop.) And finally, based on a review of sight triangle standards in use in other cities in Santa Clara County, the City of Mountain View's sight triangle detail is unusually large and covers a wider range of land use types including low-volume land uses.

Code Review Findings: Land Use and Urban Design Considerations

Standard Details A-22 specifies sight triangles at driveways.

- *While sight triangles are important at certain locations, the large sight triangles specified in this detail could result in removal of many street trees and prevent many more from being planted, while having limited or even negative benefits in terms of the stated goals of pedestrian safety.*

Street Tree Planting Types

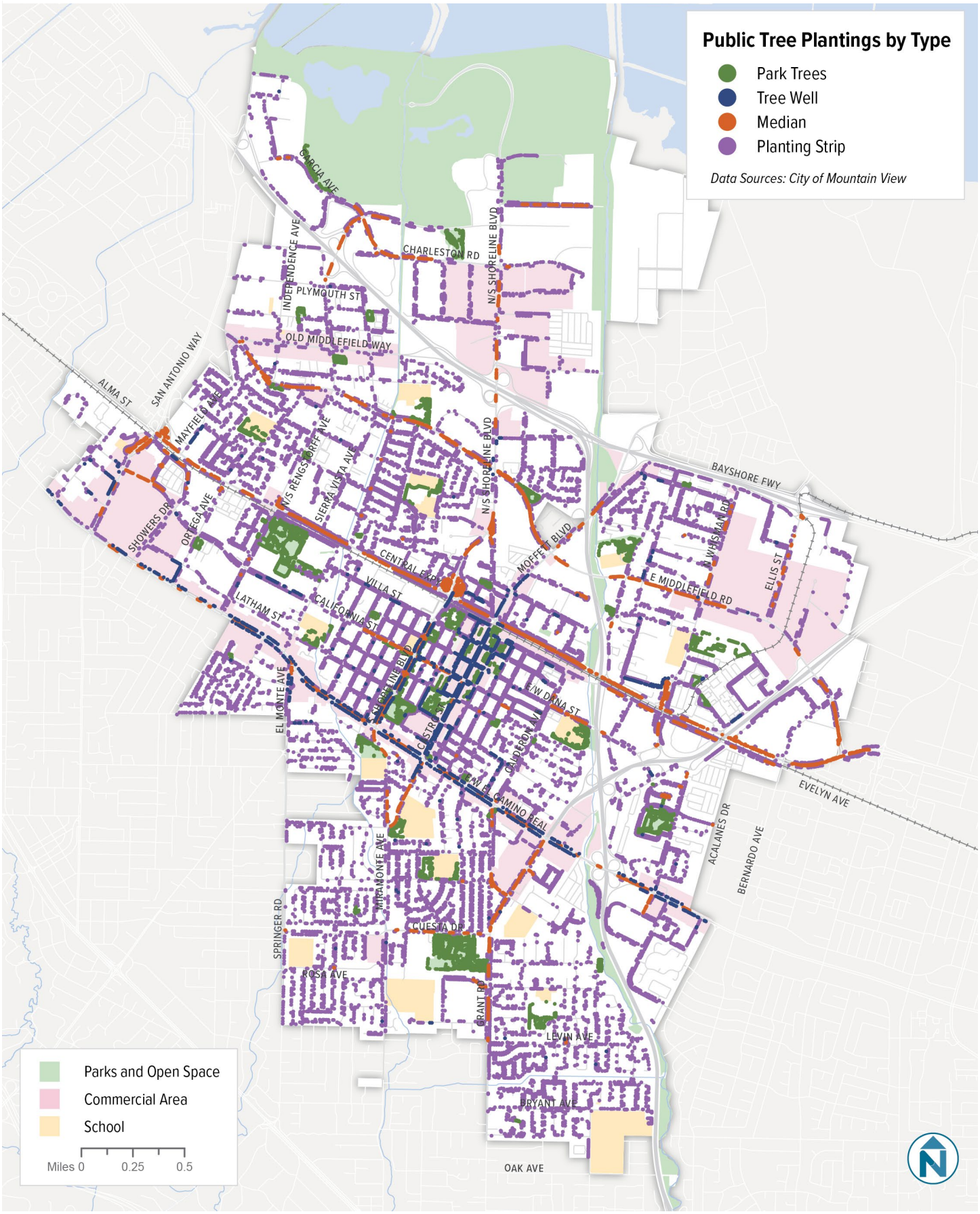
Over the years, the city has successfully planted public trees along streets, including plantings in tree wells, planting strips, medians, parking spaces, and cul-de-sacs, each offering unique challenges and opportunities. Based on the City's Urban Forest GIS Data, existing street tree planting locations in Mountain View are categorized by the following type of planting:

- Planting Strips (67%)
- Parks (16%)
- Medians (12%)
- Tree Wells (5%)

While the city's data categorizes planting locations into four primary groups, this report delves deeper into trees planted within the public right-of-way, differentiating planting types into eight categories. A brief explanation of each planting type is provided after Figure 40 including the associated challenges and opportunities.

1. Planting Strip - Detached Sidewalks and Curb Extension
2. Planting Strip - Attached Sidewalks
3. Medians
4. Protected Intersections and Bikeways (Class IV)
5. Cul-de-sac
6. Tree Wells - Sidewalk
7. Tree Wells - Parking
8. Phased Greening

Figure 43 Public Tree Planting by Type



1. Planting Strip - Detached Sidewalks and Curb Extensions

These areas, located between the street and sidewalk along the roadway and at the intersection, as with curb extensions, provide an ideal space for planting vegetation along a road. Depending on their width, they can accommodate plants from towering shade trees to low-lying perennials. These strips physically distance sidewalks from vehicular lanes, narrowing the roadway with trees that create a sense of enclosure, which can help slow traffic, reduce crash risk, and improve comfort for all users.

Challenges: Driveway sight triangles limit tree planting within planting strips. The city maintains designated street trees; all other plant material in the planting strip is the adjacent property owner's responsibility. Overgrown vegetation may impede narrow sidewalks. Low-lying plants should be used in curb extensions to maintain visibility.

Opportunities: Detached sidewalks and planted curb extensions foster safe and more comfortable pedestrian environments in residential neighborhoods. They provide shade for pedestrians, create a buffer from traffic, slowing traffic, enhancing road safety and encouraging more walking trips.

Figure 44 Examples of Planting Strips with Detached Sidewalks

Top: Morgan Street, Middle: Middlefield Road, Bottom: Oxnard, California, Source Dan Burden BikePedImages.org

2. Planting Strip - Attached Sidewalks

Planting strips between sidewalks and private property often act as buffers between the street and parking lots, buildings, or other private spaces, offering a protective boundary between public and private spaces.

Challenges: Planting strips with attached sidewalks do not provide separation between the street and the sidewalk as detached sidewalks do. Overgrown vegetation may impede narrow sidewalks.

Opportunities: Planting areas along sidewalks creates a sense of enclosure, making pedestrians feel more comfortable and less exposed. Consideration can be given to providing additional space for greening the street.

Figure 45 Examples of Planting Strips with Attached Sidewalks

Left: Morse Avenue, Center: Central Expressway, Right: San Ramon Avenue

3. Medians

Street medians present opportunities for green street elements like trees and vegetation in the center of the roadway. While large roads, like Central Expressway and West Middlefield Road, already have expansive median plantings, others lack these green elements, making them less inviting for pedestrians and cyclists.

Challenges: Due to their location, limited access makes these areas difficult to maintain and less useful for pedestrians and cyclists. Compliance with state and county design standards for highways and expressways may pose additional limitations.

Opportunities: Expanding green street treatments in medians along larger roads can help to reduce vehicle speeds, infuse vibrancy, and contribute to climate and tree canopy goals.

Figure 46 Examples of Median Plantings

Top: Central Expressway, Bottom: El Camino Real

4. Protected Intersections and Bikeways (Class IV)

The space between the bike lane and the motor vehicle travel lane, also called the protective buffer, presents opportunities for green street elements, including trees, vegetation, and bioswales. Protected intersections provide space for low-lying green treatments at the corner island.

Challenges: Protective buffer areas require available roadway space and may increase costs for plant maintenance. Other challenges include plant encroachment upon the bike lane, including tree branches. Low-lying plants should be used in protected intersection corner islands to maintain visibility.

Opportunities: Opportunities include expanding green street treatments to reduce vehicle speeds, infuse vibrancy, contribute to climate and tree canopy goals, and create separation between the bikeway and motor vehicles, thereby increasing comfort and safety for cyclists of all ages and abilities.

Figure 47 Examples of Protected Intersections and Bikeways

Top Left: Charleston Avenue, Top Right: Shoreline Boulevard at Charleston Avenue,
Bottom: Charleston Avenue

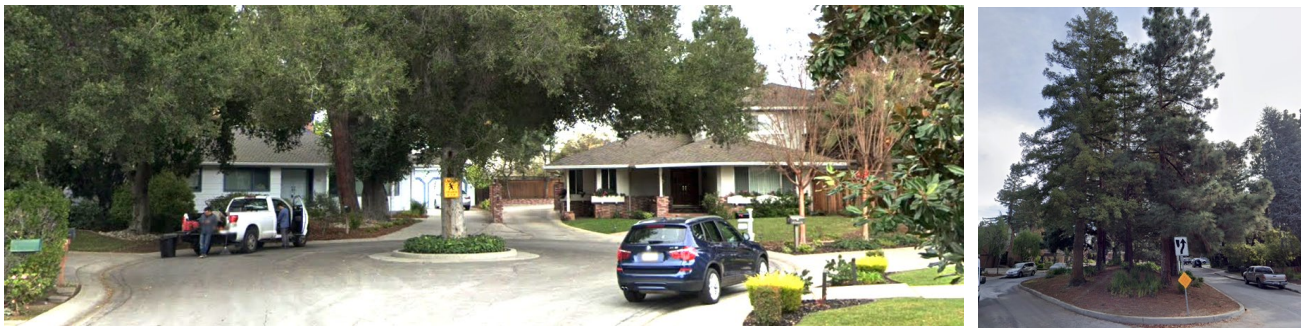
5. Cul-de-sac

Some residential neighborhoods have embraced green infrastructure by incorporating planting space in the centers of cul-de-sacs and small intersections, introducing greenery and expanding the tree canopy over otherwise entirely paved areas. These planting spaces not only break up expanses of pavement but also help maintain reasonable vehicular speeds. Planted cul-de-sacs should be explored as a useful strategy as part of the ATP. This unique Mountain View example of planting location can serve as a model for other cities.

Challenges: Limited planting area and possibly limited neighborhood support. Difficult establishment period after planting due to limited irrigation.

Opportunities: Transform traditionally non-green cul-de-sacs into lush green spaces. Serve as a model for other cities, with minimal impact on traffic flow.

Figure 48 Examples of Cul-de-Sac Plantings



Left: Damian Way, Right: Hedgerow Court

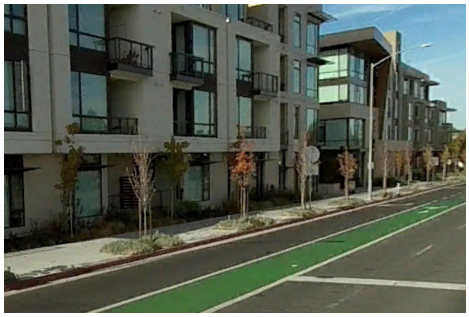
6. Tree Well – Sidewalk

Tree wells provide planting space within paved areas, and are often used in urban settings like downtown areas. These wells can be open or covered with tree grates and are typically integrated with sidewalks or tree cafes.

Challenges: Limited planting areas reduce soil volume and room for water infiltration and root growth. Few tree species are well suited for these conditions, so choices can be limited, depending on the size of the planting space.

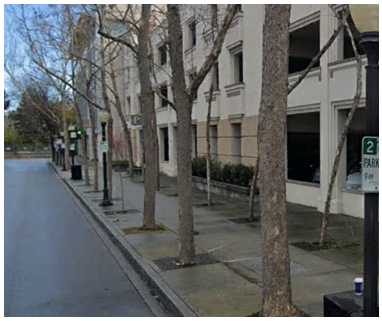
Opportunities: Plantings in tree wells help increase tree canopy in high-activity areas and create a human-scaled environment and sense of enclosure with trees on both sides of the street.

Figure 49 Examples of Tree Wells



Left: Moffett Boulevard

Middle: West Evelyn Avenue



Right: Bryant Street

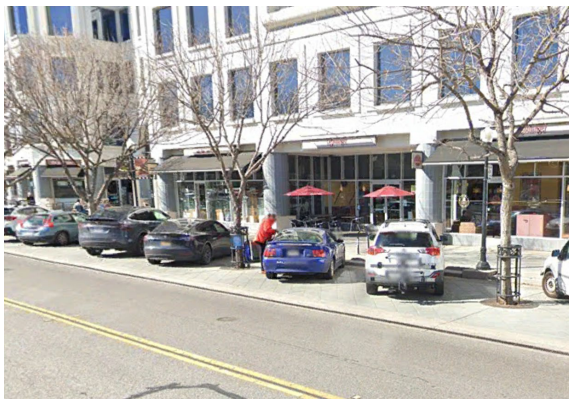
7. Tree Well - Parking Space

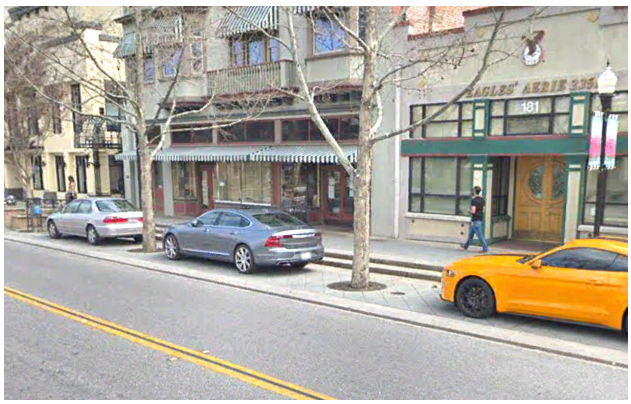
Tree wells can also be situated within parking spaces along streets.

Challenges: Tree wells in parking areas may reduce the number of parking spaces and increase the difficulty of changing the roadway layout later, potentially facing public opposition.

Opportunities: Tree wells in parking areas provide an innovative way to boost tree canopy on streets without impacting sidewalks. This prioritizes walking space and aligns with climate goals by promoting mode shift and reducing car dependency.

Figure 50 Examples of Tree Wells in a Parking Space





Left: Castro Street, Right: Castro Street

8. Phased Greening

Temporary planters and parklets have gained prominence as strategies to increase greenery and placemaking along streets, particularly in response to the COVID-19 pandemic when

cities opened streets for people and closed them for cars. These serve as valuable tools for piloting ideas and can offer interim planting spaces.

Challenges: Existing infrastructure may pose an obstacle to temporary planters and parklets, and parking may be limited.

Opportunities: These strategies provide short-term opportunities to enhance the vibrancy and comfort of the street. Strategic placement can leverage existing planting spaces.

Figure 51 Examples of Phased Greening

Left: Castro Street (east side),

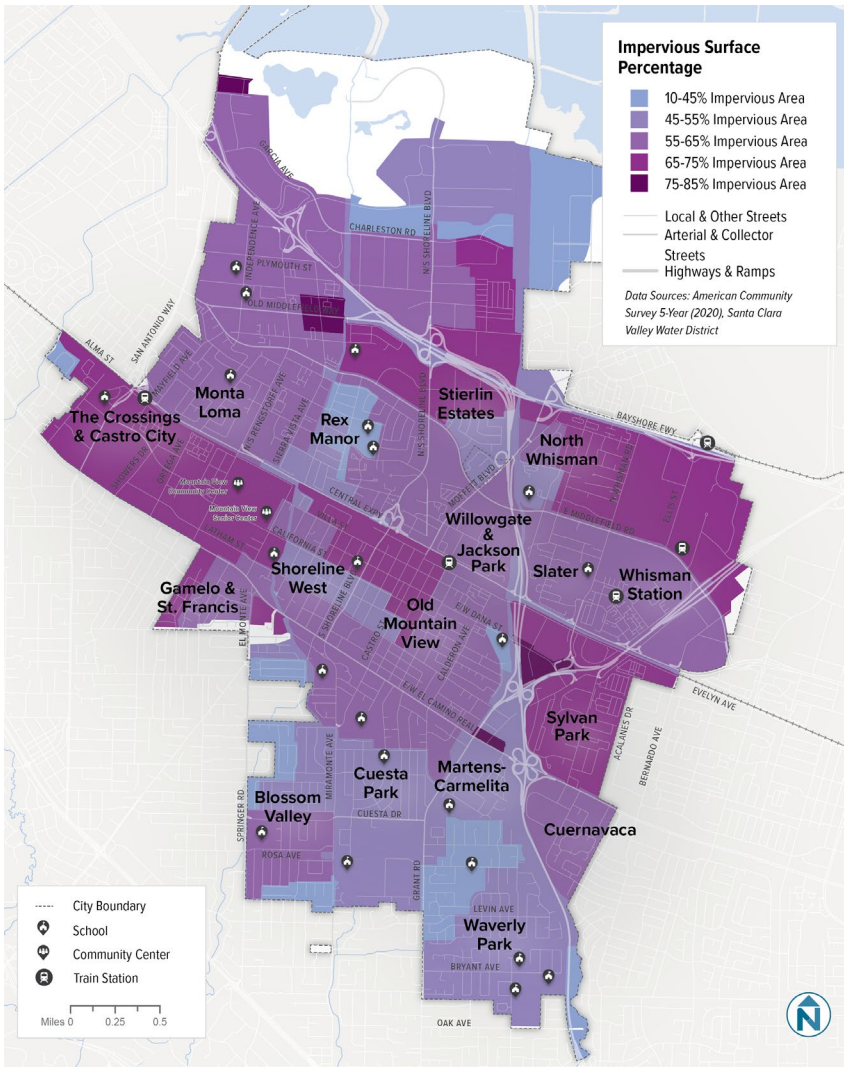
Right: Castro Street (west side)

Impervious Surface Cover

Impervious surfaces include concrete and asphalt surfaces, roofs, and other hard materials that do not allow water to soak into the ground. On the other hand, porous surfaces, like gardens and other unpaved areas, allow water to soak into the ground. As cities grow, they tend to have more impervious surfaces in the form of roads, parking lots, and buildings. These impervious surfaces harm the environment and natural systems in various ways, causing more stormwater runoff, flood risk and water pollution, and higher surface temperatures. Trees and other vegetation can make a positive difference in areas filled with impervious surfaces by soaking up rainwater and cooling down the surroundings.

In Mountain View, different neighborhoods have varying percentages of impervious surfaces, as seen in the map and table below. More impervious surfaces mean higher surface temperatures and more stormwater runoff, which can be a concern.

Figure 52 Percentage of Impervious Surfaces (Map and Table)



Neighborhood	Average Impervious Surface Percentage
Rex Manor	46%
Waverly Park	50%
Blossom Valley	51%
Martens-Carmelita	52%
Cuesta Park	53%
Old Mountain View	55%
North Whisman	58%
Willowgate & Jackson Park	58%
Stierlin Estates	60%
Cuernavaca	60%
Shoreline West	61%
Slater	63%
Whisman Station	63%
Monta Loma	65%
Sylvan Park	67%
Gamelo & St. Francis	67%
Castro City & The Crossings	68%

6. NEXT STEPS

The data and findings presented in the Existing Conditions and Needs Summary will be used to identify potential active transportation projects, policies, and programs for consideration in the ATP. Input will be sought from the community, elected officials and community partners on the potential concepts and a short list will be considered for inclusion in the plan.