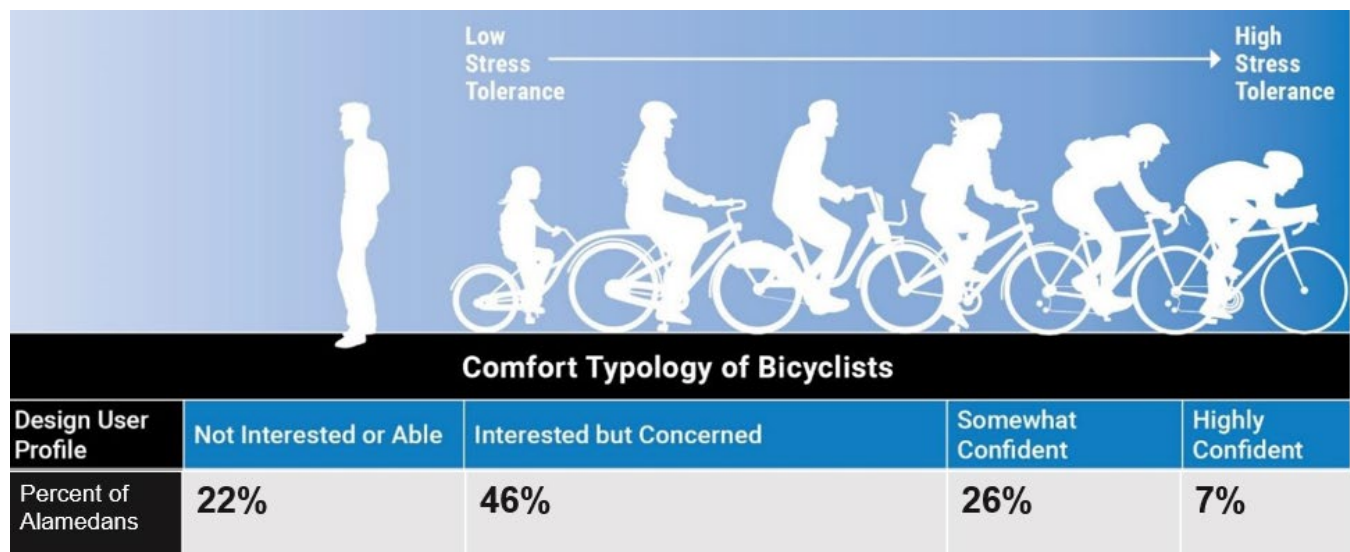# CHAPTER 5: BICYCLE NETWORK

The Bicycle Vision Network will create a comprehensive and connected network that is safe, comfortable, and enticing for people of all ages and abilities. The network, built upon the assets of the existing network, is designed to provide more direct and comfortable bicycling routes to schools, to improve north-south connectivity, and to create a bikeway network that is comfortable for a greater diversity of people than ride today.

WHO ARE WE PLANNING FOR?

The Plan's Bicycle Vision Network is designed for people of all ages and abilities, not just for those who are already riding their bicycles regularly. While many factors contribute to whether people choose to ride a bicycle for trips like commuting to work or school or running errands, one of the biggest considerations is safety and comfort. Alameda's statistically significant survey, discussed in Chapter 3, found that nearly half (46%) of city residents would bike more if there were more facilities where they felt safer and more comfortable (as shown in graphic below). This group of people, often called "Interested but Concerned," prefers low-traffic, low-speed streets or separate paths or other facilities that provide protection or physical separation from fast-moving traffic. The other half of Alamedans are either very comfortable with standard bike lanes (33%) or not at all interested in biking (22%). By increasing the miles of low-stress and protected facilities which will serve a largely untapped group of willing riders, Alameda has a much greater chance of increasing the total number of people biking for more of their trips.

Design User Profile	Not Interested or Able	Interested but Concerned	Somewhat Confident	Highly Confident
Percent of Alamedans	22%	46%	26%	7%

BICYCLE VISION NETWORK

The Bicycle Vision Network is a continuous and connected network of bikeways, including a subset of connected low-stress bikeways. When the Plan's Bicycle Vision Network is complete, Alameda will have more than doubled the cumulative length of its bikeway network. Perhaps more importantly, Alameda will have shifted its network towards one that is comfortable and safe for people of all ages and abilities by increasing the percentage of low-

stress bikeways from its current 51% of the network to 73%. The Vision Network is a long-term planning tool and will be completed over many years. See Chapter 8 for a list of projects the Plan aims to construct by 2030.

A total of 68 miles of new or upgraded bikeways and trails are proposed, as shown in Table 6 and Figure 6. Upon completion of the network, the City will exceed the Climate Action and Resiliency Plan goal to add 10.4 new miles of previously unplanned bikeways that are of a type expected to shift bicycling behavior.

Table 6. Existing and Proposed Bikeway Mileage°

Bikeway Type from Lowest to Highest Stress	Existing Length (Miles)	Proposed Length (Miles)	Total Length (Miles)*	Low-Stress
Shared use paths (and parallel, separated biking and walking paths)	26	15	41	✓
Separated Bike Lane	7	17	24	✓
Neighborhood Greenway	0	19	19	✓
Buffered Bicycle Lane	3	5	8	varies[n]
Bicycle Lane	18	7	17	
Bicycle Route	11	3	5	
Type TBD	0	2	2	
Total	**65**	**68**	**116**	

°Existing mileage includes all bikeways planned to be built by 2024.
*Total mileage values do not always reflect the sum of "existing" plus "proposed" because some existing bikeways will be upgraded to different types of bikeways.
[n]Buffered bicycle lanes can be low-stress on low-volume, low-speed streets.

The Bicycle Vision Network was developed by reviewing the existing bicycle network, the unbuilt recommendations from the 2010 Bicycle Master Plan and equity priority areas, plus a review of community feedback, and network and facility selection best practices, including the Federal Highway Administration's Bikeway Selection Guide (2019) and the forthcoming American Association of State Highway and Transportation Officials' Guide for the Development of Bicycle Facilities.

LOW STRESS BIKEWAY VISION NETWORK

The Bikeway Vision Network includes 84 miles of connected low stress facilities, which people of all ages and abilities can use to comfortably and safely get around Alameda. These facilities, which include shared use paths, separated bike lanes, and neighborhood greenways, are also shown on their own map, Figure 7: Low Stress Bikeway Vision Network.

CROSSING IMPROVEMENTS

While the network is focused on determining the appropriate bikeway type for each street, comfortable roadway crossings are key to developing a safe and well-connected bicycle network and are particularly important in creating an all ages and abilities network. Crossing treatments may include protected intersections, neighborhood traffic circles, bicycle signals, rectangular rapid flashing beacons, bike boxes, and left-turn boxes. Many of these treatments are described in *Appendix F. Pedestrian and Bicycle Facility Types*. All designs for new and upgraded bikeways will include safe and well-designed crossings, especially of major streets.
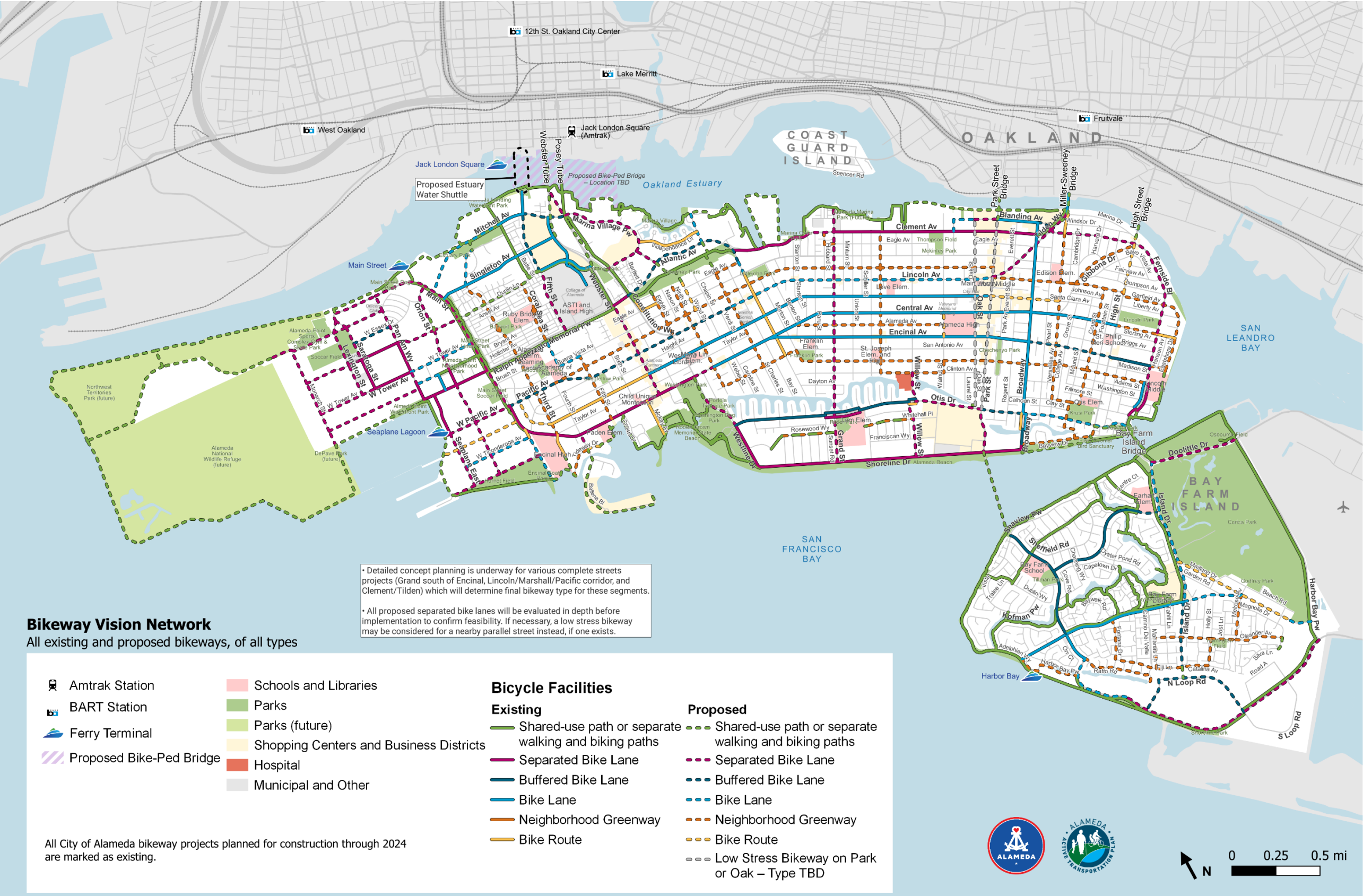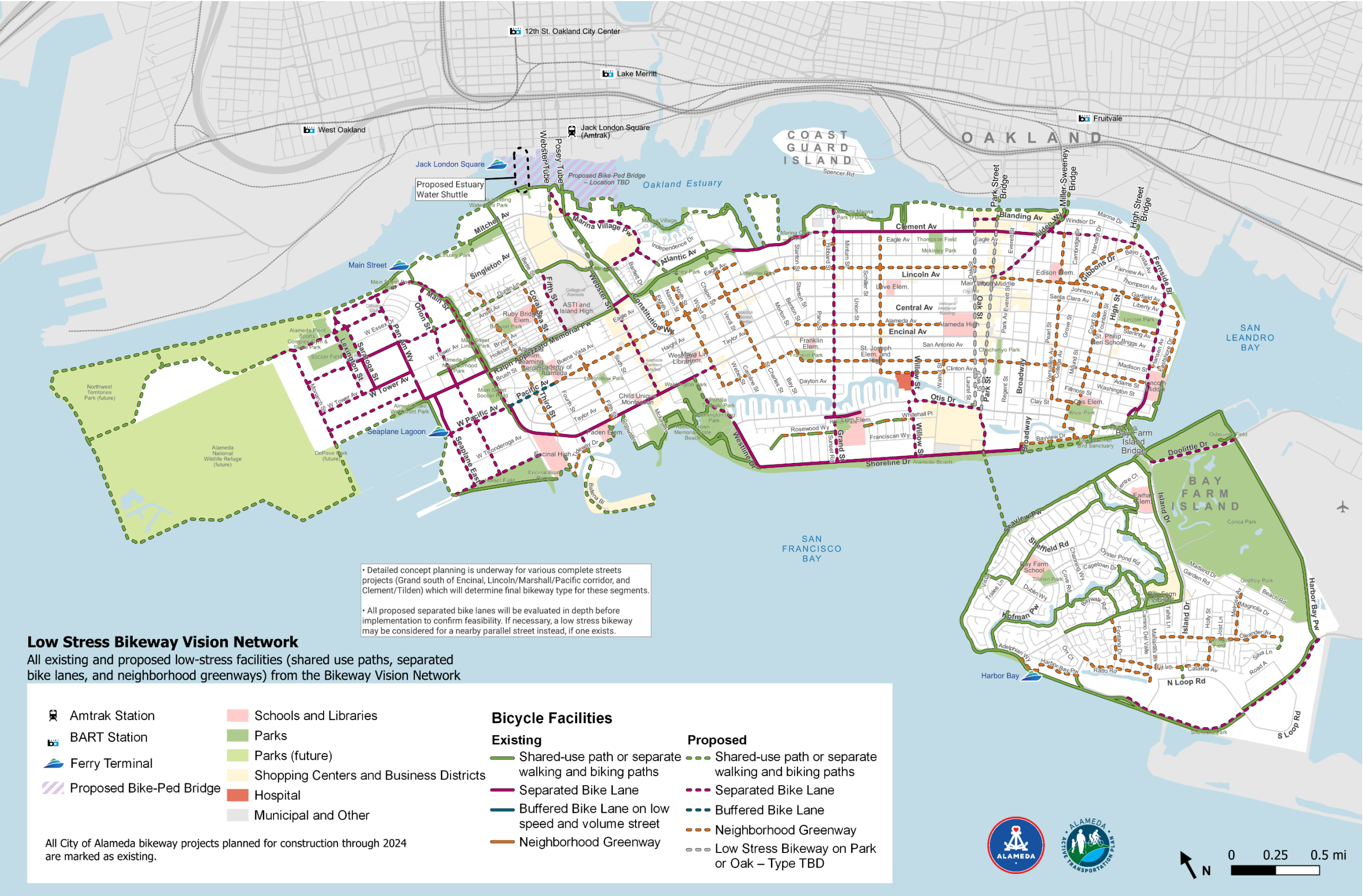
• Detailed concept planning is underway for various complete streets projects (Grand south of Encinal, Lincoln/Marshall/Pacific corridor, and Clement/Tilden) which will determine final bikeway type for these segments.

• All proposed separated bike lanes will be evaluated in depth before implementation to confirm feasibility. If necessary, a low stress bikeway may be considered for a nearby parallel street instead, if one exists.

Bikeway Vision Network
All existing and proposed bikeways, of all types

Legend

- Amtrak Station
- BART Station
- Ferry Terminal
- Proposed Bike-Ped Bridge

- Schools and Libraries
- Parks
- Parks (future)
- Shopping Centers and Business Districts
- Hospital
- Municipal and Other

All City of Alameda bikeway projects planned for construction through 2024 are marked as existing.

Bicycle Facilities

Existing	Proposed
Shared-use path or separate walking and biking paths	Shared-use path or separate walking and biking paths
Separated Bike Lane	Separated Bike Lane
Buffered Bike Lane	Buffered Bike Lane
Bike Lane	Bike Lane
Neighborhood Greenway	Neighborhood Greenway
Bike Route	Bike Route
	Low Stress Bikeway on Park or Oak – Type TBD

0   0.25   0.5 mi

N

Figure 6. Bikeway Vision Network

Low Stress Bikeway Vision Network

All existing and proposed low-stress facilities (shared use paths, separated bike lanes, and neighborhood greenways) from the Bikeway Vision Network

- Amtrak Station
- BART Station
- Ferry Terminal
- Proposed Bike-Ped Bridge

All City of Alameda bikeway projects planned for construction through 2024 are marked as existing.

- Schools and Libraries
- Parks
- Parks (future)
- Shopping Centers and Business Districts
- Hospital
- Municipal and Other

Bicycle Facilities

Existing
- Shared-use path or separate walking and biking paths
- Separated Bike Lane
- Buffered Bike Lane on low speed and volume street
- Neighborhood Greenway

Proposed
- Shared-use path or separate walking and biking paths
- Separated Bike Lane
- Buffered Bike Lane
- Neighborhood Greenway
- Low Stress Bikeway on Park or Oak – Type TBD

• Detailed concept planning is underway for various complete streets projects (Grand south of Encinal, Lincoln/Marshall/Pacific corridor, and Clement/Tilden) which will determine final bikeway type for these segments.

• All proposed separated bike lanes will be evaluated in depth before implementation to confirm feasibility. If necessary, a low stress bikeway may be considered for a nearby parallel street instead, if one exists.

Figure 7. Low-Stress Bikeway Vision Network

DESCRIPTIONS OF BIKEWAY TYPES

The six bikeway types that make up the recommended Bicycle Vision Network, and their stress level, are described in Table 7, below. While most of these bikeway types exist in Alameda today, the recommended network introduces a new-to-Alameda, low-stress bikeway type: the Neighborhood Greenway. The 19 proposed miles of Neighborhood Greenways are critical for creating a connected, low-stress network in Alameda.

INTRODUCING: NEIGHBORHOOD GREENWAYS

Neighborhood Greenways, sometimes called bicycle boulevards or neighborhood bike routes, are streets designed to give priority to people walking and bicycling, and to allow bicyclists and motorists to safely share the road on low-volume, low-speed, local streets. Used in cities across the country, these comfortable, low-stress bikeways additionally improve walking safety and calm traffic.

Treatments are much more extensive than on bicycle routes, which only have painted shared lane markings and signage. Key goals are described below.
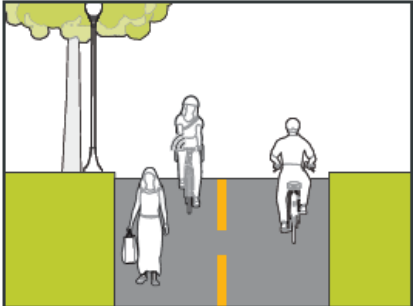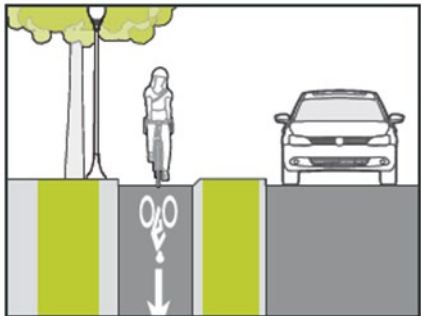
» **Achieve and Maintain Low Vehicle Volumes and Speeds**
Neighborhood Greenway streets are only considered low stress when the traffic volumes and speeds are low enough that people biking feel comfortable sharing the roadway space with cars. This Plan sets targets of average daily traffic of 1,500 vehicles or less, with less than 50 cars in the peak direction at peak hour, and a vehicular travel speed of 20 mph for Neighborhood Greenways. Traffic calming measures to reach these targets will be chosen based on the specific need of each street, and could include speed cushions, neighborhood traffic circles, traffic reduction treatments like partial diverters or turn restrictions, pavement markings, and wayfinding signs to designate the route. Reducing traffic speeds and volumes increases safety for all roadway users and improves neighborhood livability.
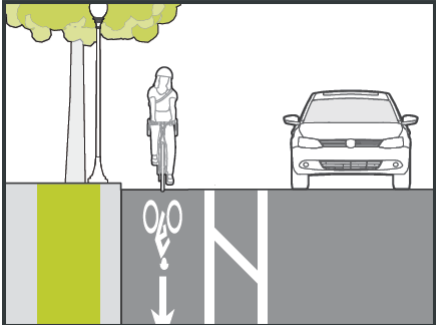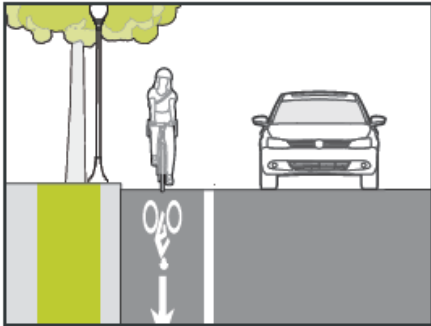
» **Make Street Crossings Safer and More Comfortable**
Neighborhood Greenways also include treatments to improve crossings, especially at busy intersections. Intersection treatments may include high-visibility crosswalk markings, raised crosswalks, or Rectangular Rapid Flashing Beacons to make it easier and safer for people bicycling and walking to cross a busy street.

Table 7. Existing and Proposed Bicycle Facility Types in Alameda

Bicycle Facility Type	Description
Shared Use Path	» Off-street pathway designed for use by bicyclists, pedestrians and other active transportation users. » *Variation:* Parallel but separated biking and walking paths » *Stress level:* Low. Has the least potential number of interactions between bicyclists and vehicles, compared to other facility types » *Caltrans classification:* Class I » ***Examples in Alameda:*** Bette Street path, Bay Farm Island shoreline trails
Separated Bike Lane	» Designated lane or lanes for bicycles (and other active transportation devices with comparable speeds, such as electric scooters) separated from vehicular traffic and the sidewalk by a vertical element (e.g., flexible posts, planters, parked vehicles, curbs, etc.) The more robust the buffer's vertical and horizontal separation, the more comfortable the separated bike lane is for bicyclists » City policy is to provide separated bicycle lanes instead of standard bicycle lanes unless infeasible. *(General Plan)* » *Variations:* Can be one-way, on each side of the street, or two-way, on one side of the street. » *Stress level:* Low, even on roadways with high vehicle speeds and volumes » *Caltrans classification:* Class IV » ***Examples in Alameda:*** Shore Line Drive, Fernside Drive, Clement Avenue
Neighborhood Greenway	» Bicyclists share travel lanes with vehicular traffic on low-volume, low-speed streets. Treatments may include traffic calming (like speed cushions), traffic reduction treatments (like partial diverters or turn restrictions), pavement markings (like sharrows) and wayfinding signs to designate the route. » *Stress level:* Low » *Caltrans classification:* Class IIIB » ***Examples in Alameda:*** None yet, but this Plan recommends 19 miles of future Neighborhood Greenways

Bicycle Facility Type	Description
Buffered Bike Lanes	» Bicyclists ride next to vehicular traffic in a lane designated by paint only, with a striped buffer area between the bicyclist and travel lane that neither vehicles nor bicyclists should use. » *Stress level:* Medium. Can be considered lower stress for most adults, if installed on roadways with vehicle speeds of 30 mph or less and lower traffic volumes. However, stress level can increase with adjacency to on-street parking. » *Caltrans classification:* Class IIB » ***Examples in Alameda:*** portions of Robert Davey Jr. Drive, Fernside Drive, and Willie Stargell Avenue
Bike Lane	» Bicyclists ride adjacent to vehicular traffic in a lane designated by a painted line only. » *Stress level:* Medium to High. Stress level can increase with adjacency to on-street parking. » *Caltrans classification:* Class II » ***Examples in Alameda:*** Central Avenue, Broadway, Mecartney Road
Bike Route	» Bicyclists share travel lanes with vehicular traffic. Bicycle route signage and optional pavement markings (e.g., sharrows) are typically included to increase driver awareness of bicyclists and aid bicyclists with navigation » *Stress level:* Medium to High, depending on amount and speed of vehicle traffic. Stress level can increase with adjacency to on-street parking. » *Caltrans classification:* Class III » ***Examples in Alameda***: Oak Street, Pacific Avenue, Versailles Avenue