Appendix G. Focus Station Area Action Plans

Safe Trips to BART

Focus Station Area Action Plan

Project Background and Purpose

BART developed *Safe Trips to BART: An Action Plan for Safer Roadways*, an action plan to reduce and eliminate fatal and severe roadway injuries on BART property and roadways surrounding stations. This effort is funded by the US Department of Transportation's Safe Streets for All grant program, which supports initiatives to prevent deaths and severe injuries on roadways. BART's Safety Action Plan builds on local and regional safety efforts related to Vision Zero, a global movement to eliminate severe and fatal injuries on roadways.

The Focus Station Area Action Plans (FSAAPs) are a set of conceptual roadway safety recommendations for the selected focus stations based on the systemic safety analysis and toolbox developed through this action plan.

BART will not implement these recommendations directly, as these roadways are largely outside of BART's jurisdiction. Instead, BART will collaborate with local agencies having jurisdiction (AHJs) to seek funding and support the execution of these plans. AHJs are encouraged to implement these recommendations in a manner that aligns with their agency's goals and maintains acceptable service levels for transit operators and other city services.

High Injury Network (HIN)

BART developed a High Injury Network (HIN) to identify and prioritize areas of the street network where injuries and fatalities have been occurring most frequently. Streets on the HIN should be prioritized for improvements ahead of streets not on the HIN.

The primary input in the development of the HIN was police crash report data that were retrieved for the years 2019-2023 from UC Berkeley's Transportation Injury Mapping System (TIMS). TIMS data are derived from California's Statewide Integrated Traffic Records System (SWITRS) and geocoded by UC Berkeley's SafeTREC. A full description of the BART HIN methodology and analysis is outlined in Appendix B.

The BART HIN is expected to differ from other HINs created by various local and regional partner agencies due to variations in data and methodologies. The BART HIN is a regional HIN that was developed using data from station areas across five counties, whereas other HINs were developed using more local data or data for the nine-county Bay Area. The BART HIN does not aim to replace, but rather seeks to complement other HINs by providing additional evidence to support investment in priority corridors.

Station Study Area

Station study areas are the areas surrounding BART stations where riders typically walk, bike, or drive to get to the BART station. BART's Station Access Typology (2016) was used to define the types and sizes of the study areas. BART's Station Access Typology defines five station types characterized by the built environment and orientation to driving: Urban, Urban with Parking, Balanced Intermodal, Intermodal - Auto Reliant, and Auto Dependent. The study area sizes selected for each station access type were pulled from BART's Station Profile Study (2015), and study areas were developed using the open-source tool OpenTripPlanner. More details can be found in Appendix B.

Selection of Focus Station Areas

Several criteria were used to determine the selected stations, including crash history, the absence of planned or recently completed local safety improvements, station location in equity priority community areas, and local agency capacity to support this effort. BART also considered whether the station had plans for transit-oriented development. At least one station from each of the five counties was selected, and one additional station was selected from the two largest counties: Alameda and Contra Costa.

First, BART reached out to the cities with stations that had the highest crash statistics. Further discussion with local and county partners revealed that some cities already had ongoing safety efforts and did not have capacity to work with BART to develop FSAAPs. Next, BART spoke to county representatives and Steering Committee members to identify which agencies had need, interest, and capacity to support development of these plans. The following seven stations were selected as a result of this criteria: **Balboa Park** (City and County of San Francisco), **Coliseum** (Alameda County), **Colma** (San Mateo County), **Concord** (Contra Costa County), **Hayward** (Alameda County), **Milpitas** (Santa Clara County), and **Richmond** (Contra Costa County).

Existing Plans Review

A full review of existing plans and planned projects was conducted for all 48 non-airport BART stations (Review of Existing Plans and Projects by Station Area and Agency – Appendix C). The planned projects for each of the seven Focus Station Areas were reviewed to ensure that recommendations would complement these efforts and offer additional suggestions where relevant. These projects are shown in purple throughout the FSAAP documents.

Focus Station Area Walk Audit

Walk audit routes were determined in collaboration with partner agency staff. Inputs included choosing public roads and intersections that were contained in the Station Study Area HIN, those that were identified by public or agency staff, and/or locations where there were no improvements planned. Based on this information, the project team developed a recommended walking route that guided each walk audit. In some cases, other streets were also considered for improvements based on observations during the site visit and recommendations from agency staff and representatives from citizen groups who joined the walk audit. Only a selection of streets on the HIN were feasible to visit due to time constraints.

Countermeasure Selection

BART developed a toolbox of traffic safety countermeasures to guide the selection of interventions recommended as part of the FSAAPs. The toolbox draws from industry best practice such as the NCHRP 926 Report: Guidance to Improve Pedestrian & Bicyclist Safety at Intersections, the Caltrans Pedestrian Safety Countermeasures Toolbox, FHWA's Proven Safety Countermeasures list, and local stakeholder input.

Safety benefits are described within the FSAAPs according to the FHWA Safe System Roadway Design Hierarchy, which is informed by the Safe System Approach. The Safe System Approach is a traffic safety philosophy that accounts for the likelihood that people make mistakes, but the cost of those mistakes should not result in a loss of life or serious injury. The four tiers of the hierarchy are described below:

Tier 1 - Remove Severe Conflicts: Countermeasures in this tier aim to eliminate high risk conditions by providing physical separation between users moving at different speeds or in different directions to minimize conflicts and reduce collision risk. This separation is typically accomplished with countermeasures that address intersection and roadway design.

Tier 2 - Reduce Vehicle Speeds: Countermeasures in this tier aim to implement appropriate speed limits and speed management strategies to limit crash severity and likelihood. Speed management countermeasures include elements of self-enforcing roadways (i.e., roadways that communicate the appropriate speed and user behavior through land use and design) and traffic calming to slow vehicles and enforce appropriate vehicle speeds.

Tier 3 - Manage Conflicts in Time: Countermeasures in this tier aim to separate users in time, e.g. with traffic signals or hybrid beacons to reduce crash likelihood.

Tier 4 - Increase Attentiveness and Awareness: Countermeasures in this tier aim to alert roadway users to potential conflicts and reinforce the concept of shared responsibility. Typical tier 4 countermeasures reinforce key elements of the roadway and remind users to stay aware and comply with the rules of the road.

Final Recommendations

A design session to brainstorm recommended improvements followed every walk audit, and all participants provided input to ensure a collaborative process. The identified roadway safety measures were summarized in the FSAAP, which were distributed to partner agencies to ensure alignment. Partner agency concurrence was crucial as they would be the ones taking the lead to design, fund, and construct the recommended improvements on roadways under their jurisdiction. As the partner agencies take these recommendations forward, further coordination will be needed to ensure the final designs do not interfere with bus operations or other city services.

It is important to note that only a selection of streets on the HIN were feasible to include in the FSAAP due to time and budget constraints. The FSAAPs reflect recommendations that were identified during the walk audit and do not capture the full extent of possible safety interventions within a Station Study Area.

Cost Estimates

Capital cost estimates were assessed for each of the recommendations that were identified on the walk audit. The estimates include direct costs, indirect costs, contractors' costs, and contingency, and they are assessed at a Class 5 estimate according to the Association for the Advancement of Cost Engineering classification matrix. The primary methodology follows a parametric approach using historical data and is supplemented by unit cost assemblies. Cost estimates were rounded up to the nearest $100,000 or the nearest $10,000 if under $50,000.

Cost estimates do not include projects that have been identified by local jurisdications (shown in purple call-outs) or recommendations that begin with "study" or "explore." The estimates also do not include utility change costs associated with concrete elements, signal equipment upgrade costs, or bus shelter costs unless specified.

Key Definitions

Station Access Type
The BART 'Station Access Type' reflects the current and aspirational (if applicable) typology of the station according to BART's 2016 Station Access Policy (Station Access Policy). This information provides context for the area surrounding the station and may impact the access mode share. Aspirational access types help inform the kind of development that may be anticipated around the station in the future.

Access Mode Share
'Access Mode Share' reflects the mode share of riders traveling between from home locations to BART as assessed during the 2015 Station Profile Stude, which was the most recently available data (Station Profile Study).

Station Area Map
The 'Station Area Map' shows the study area that was reviewed as part of this process. Yellow lines indicate a corridor located on the High Injury Network (HIN) that was developed as part of this project, and purple outlines indicate an area where planned projects have already been identified by the local jurisdictions or as part of wider planning efforts.

Safety by the Numbers
The 'Safety by the Numbers' section of the FSAAPs offers a snapshot of collision data from within the study area between 2019-2023. This data comes from the Transportation Injury Mapping System (TIMS), which is maintained by UC Berkeley. The 'Percent of station study are street miles on the HIN' indicates how widely station access may be impacted by traffic safety challenges.

Killed/Severe Injury (KSI) Crashes
The Killed/Severe Injury (KSI) Crashes shows how the total number of people killed or severely injured within the study area is distributed across different modes.

Key Corridors and Intersections
The 'Key Corridors and Intersections' map shows the HIN as well as the locations where recommendations identified during the walk audit are located throughout the study area.

Corridor and Intersection Recommendations
The Corridor and Intersection Recommendations graphics describe the recommended improvements along corridors and at intersections throughout the study area. Where applicable, previously-identified planning projects are also shown. Corridor recommendations are labeled on maps while intersection recommendations are drawn. Safety benefits for each set of recommendations are provided below each graphic and organized by the Safe System Approach tiers. AHJs are encouraged to implement these recommendations in a manner that aligns with their agency's goals.

Balboa Park

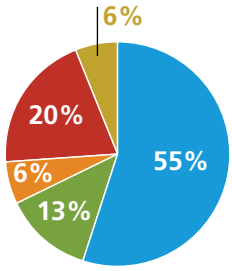
Focus Station Area Action Plan

Station at a Glance

Station Access Type: Urban

Access Mode Share

- Walk
- Transit
- Bicycle
- Drive Alone / Carpool
- Drop Off / Taxi / Other



Station Area Map

Jurisdiction(s) with roads on HIN: City and County of San Francisco, Caltrans

Safety by the Numbers

5-year Collision Data: 2019-2023

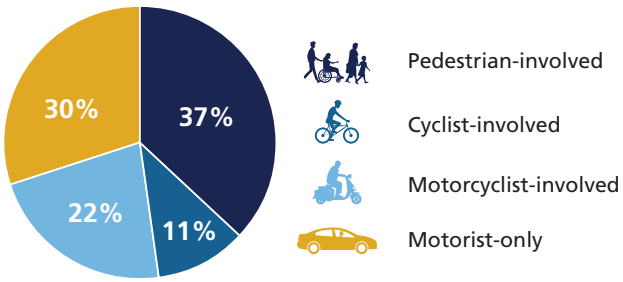
30% Percent of Station study area street miles on the HIN

27 Number of people killed or severely injured (KSI)

9% Percent of crashes that resulted in KSI

Killed/Severe Injury (KSI) Crashes

Total KSI: 27



Balboa Park

Focus Station Area Action Plan

Key Corridors and Intersections

Jurisdiction(s) with roads on HIN: City and County of San Francisco, Caltrans

1 Ocean Avenue from I-280 to Cayuga Avenue

2 Geneva Avenue from Ocean Avenue to London Street

3 Ocean Avenue & Onondaga Avenue

4 Ocean Avenue & Cayuga Avenue

5 Geneva Avenue & Cayuga Avenue

Balboa Park

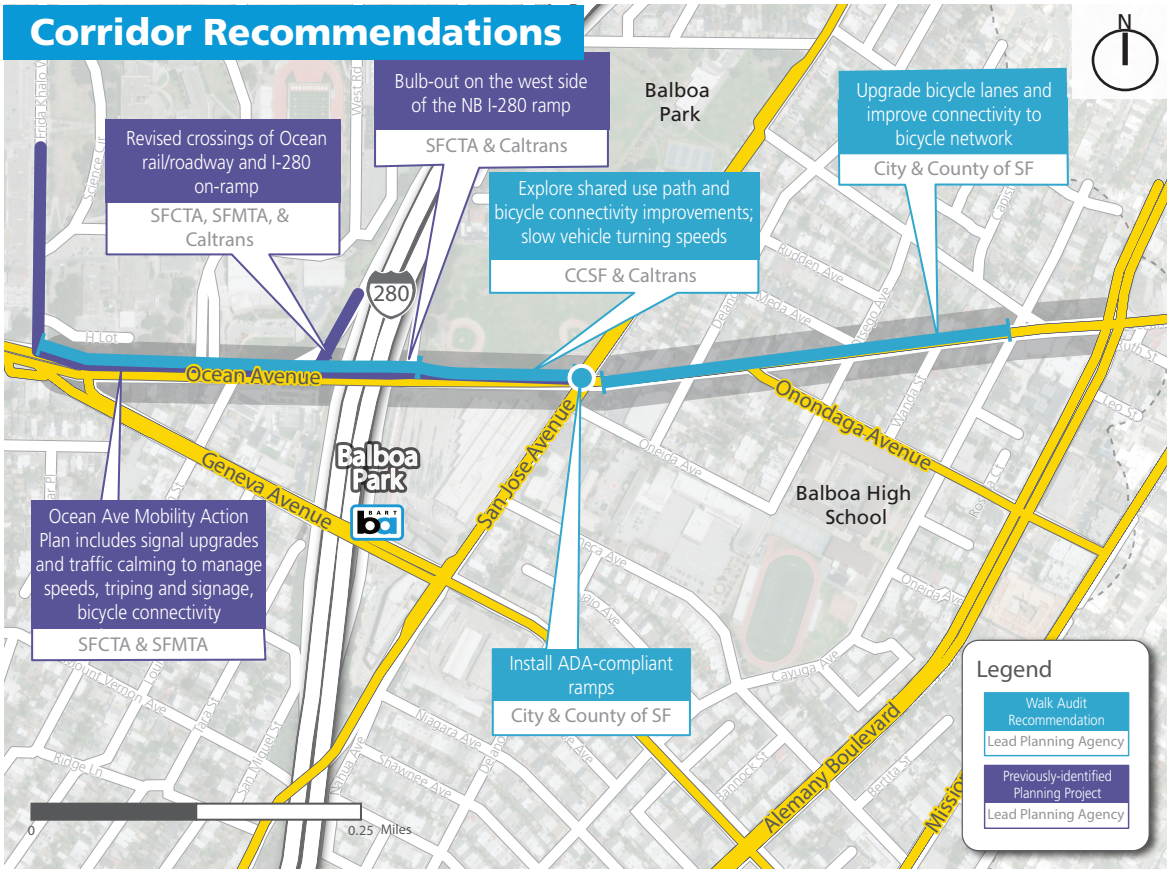
Focus Station Area Action Plan

1 Ocean Avenue from I-280 to Cayuga Avenue

Corridor Context

- This east-west collector street has a high amount of multimodal activity: I-280 on- and off-ramps, BART station access, Muni routes K, 29 and 49, and a combination of shared/standard bikeways.
- Survey respondents reported safety concerns crossing on/off ramps on Ocean Ave and walking across Muni tracks to get to the BART station.
- There have been 60 collisions on this corridor from 2019 to 2023, with nearly half involving pedestrians and bicyclists. Risk factors on this corridor include lack of adequate lighting, uncontrolled intersection crossings, and proximity to bus stops on Ocean Ave.

Corridor Recommendations



Safety Benefits

FHWA Tier 1 Safety Countermeasures to Remove Severe Conflicts:

- Physically separated bicycle lanes provide more separation between bicyclists and vehicles to reduce chance for severe conflicts.
- ADA-compliant ramps provide access to separated walkways for all pedestrians.

FHWA Tier 2 Safety Countermeasures to Reduce Vehicle Speeds:

- Realigned roads and intersections reduce turn speeds and improve sightlines between vehicles, pedestrians, and bicyclists.

Estimated Capital Cost

$200,000

In US Dollars 2025

Balboa Park

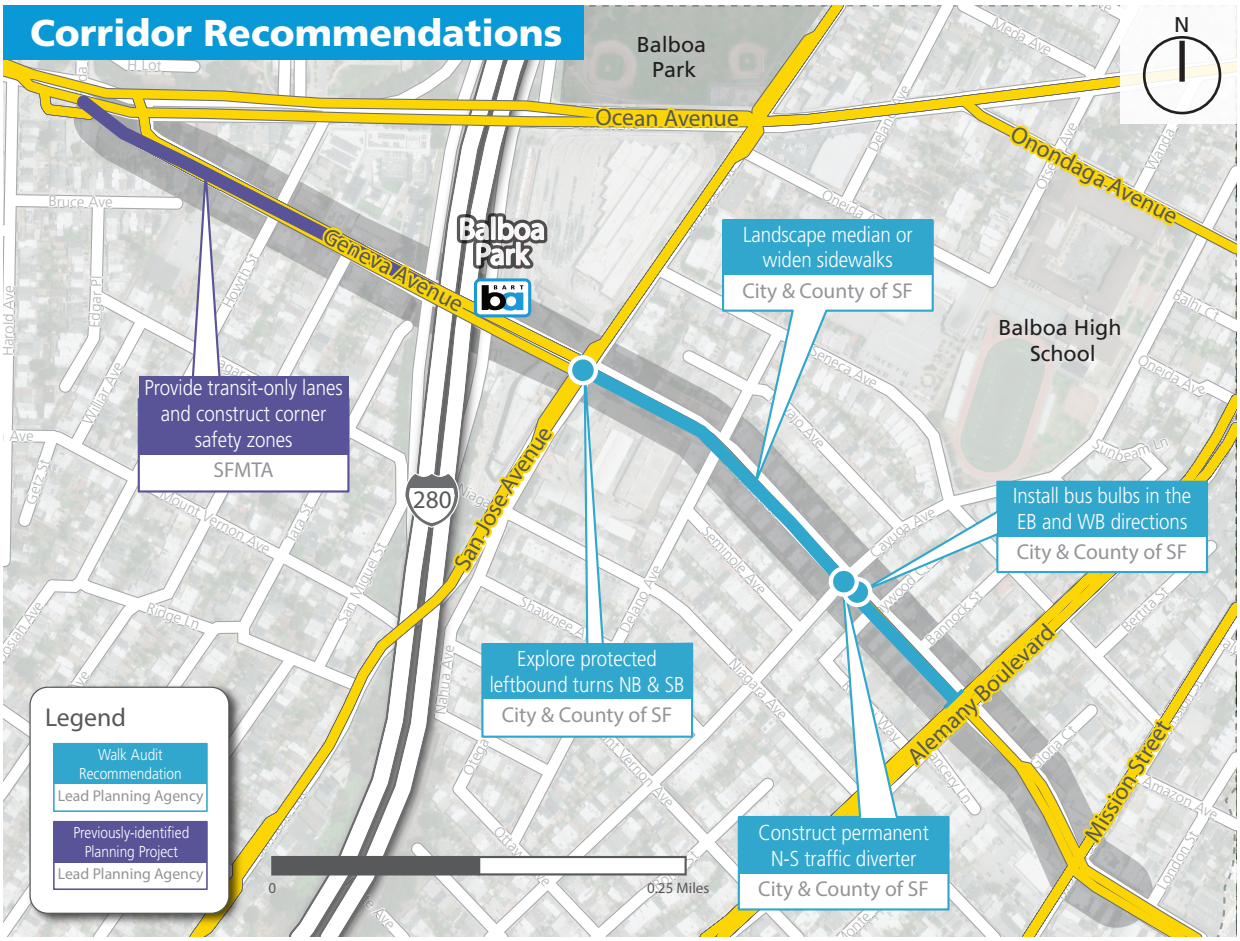
Focus Station Area Action Plan

2 Geneva Avenue from Ocean Avenue to London Street

Corridor Context

- Geneva Ave connects the Excelsior and Crocker Amazon neighborhoods to Balboa Park Station. It serves as a major bus corridor (Muni routes 8, 9, and 54) and consists of four travel lanes, on-street parking, and shared-road bike markings near the station. It also provides on- and off-ramp access to I-280.
- Survey respondents reported near misses with cars crossing I-280 ramps on Geneva Ave when drivers are in a rush.
- This corridor segment recorded 81 collisions, of which 19 were pedestrian-related incidents, from 2019-2023. High-incident areas include the I-280 ramps, Cayuga Ave, and Mission St.

Corridor Recommendations



Safety Benefits

FHWA Tier 1 Safety Countermeasures to Remove Severe Conflicts:

- Bus bulbs reduce crossing distances and enable buses to service a stop without merging in and out of travel lanes.
- Medians reduce the risk of head-on collisions by physically separating opposing travel lanes.
- Traffic diverters reduce cut through traffic and conflict exposure.

FHWA Tier 2 Safety Countermeasures to Reduce Vehicle Speeds:

- Medians and bus bulbs reduce the width of the road, encouraging slower vehicle speeds.

FHWA Tier 3 Safety Countermeasures to Manage Conflicts in Time:

- Protected turns separate turning vehicle traffic from opposing movements of all modes.

Estimated Capital Cost

$300,000

In US Dollars 2025

Balboa Park

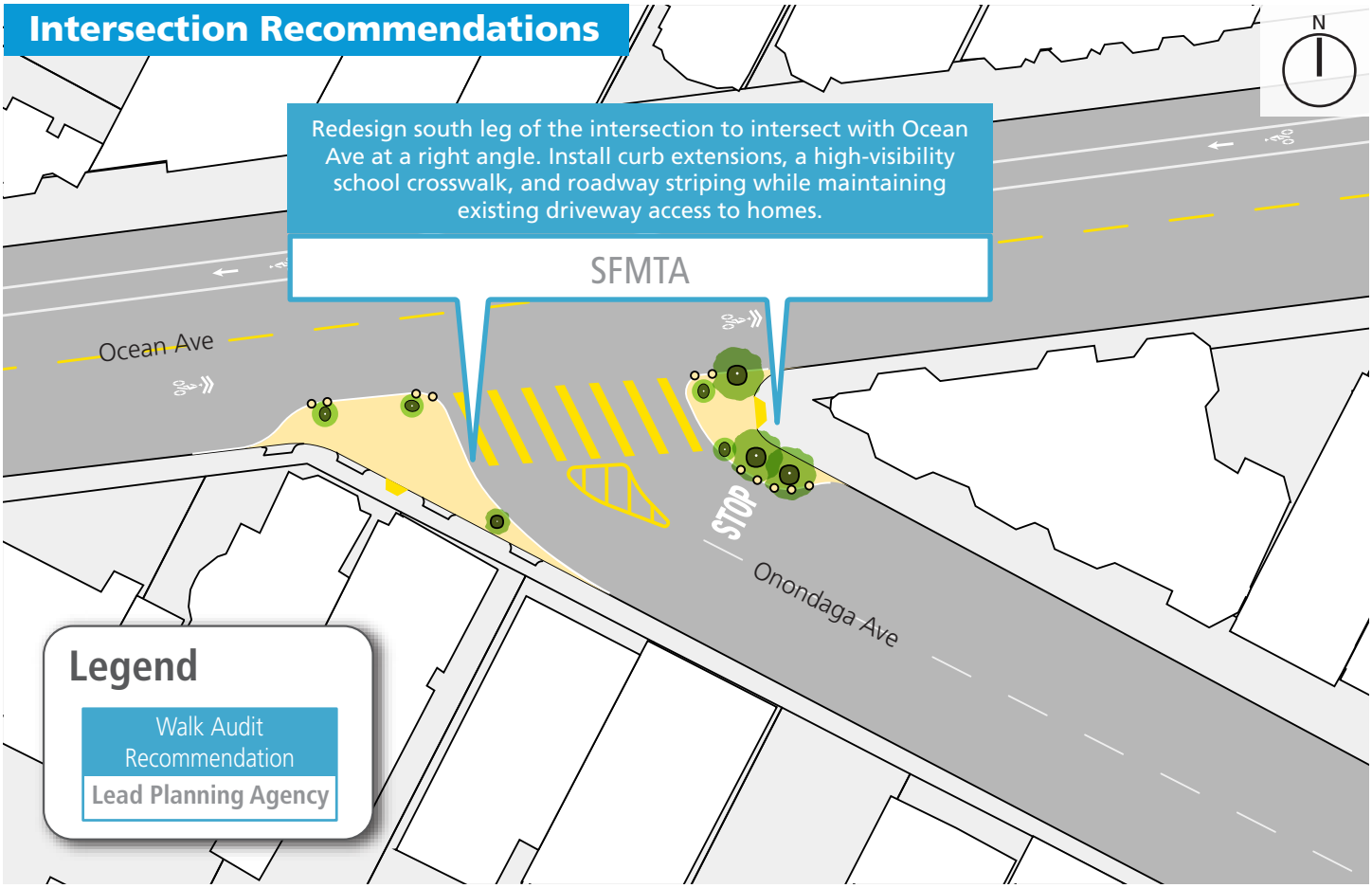
Focus Station Area Action Plan

3 Ocean Avenue & Onondaga Avenue

Intersection Context

- Ocean Avenue and Onondaga Avenue is an intersection with a higher risk of collisions due to its geometry. The 45 degree angle encourages high speed turns from eastbound Ocean Ave, and visibility can be limited between motorists on both streets.
- Driveways located at the intersection and on-street parking also pose challenges to implementing improvements at this intersection.

Intersection Recommendations



Safety Benefits

FHWA Tier 1 Safety Countermeasures to Remove Severe Conflicts:

- Square up the intersection to reduce turn speeds and improve sightlines between vehicles, pedestrians, and bicyclists.

FHWA Tier 2 Safety Countermeasures to Reduce Vehicle Speeds:

- Bulb-outs reduce the width of the roadway and encourage drivers to reduce speed.

FHWA Tier 4 Safety Countermeasures to Increase Attentiveness and Awareness:

- High visibility crosswalks make crossing pedestrians more visible to drivers.

Estimated Capital Cost

$10,000 (Quick Build)

In US Dollars 2025

Balboa Park

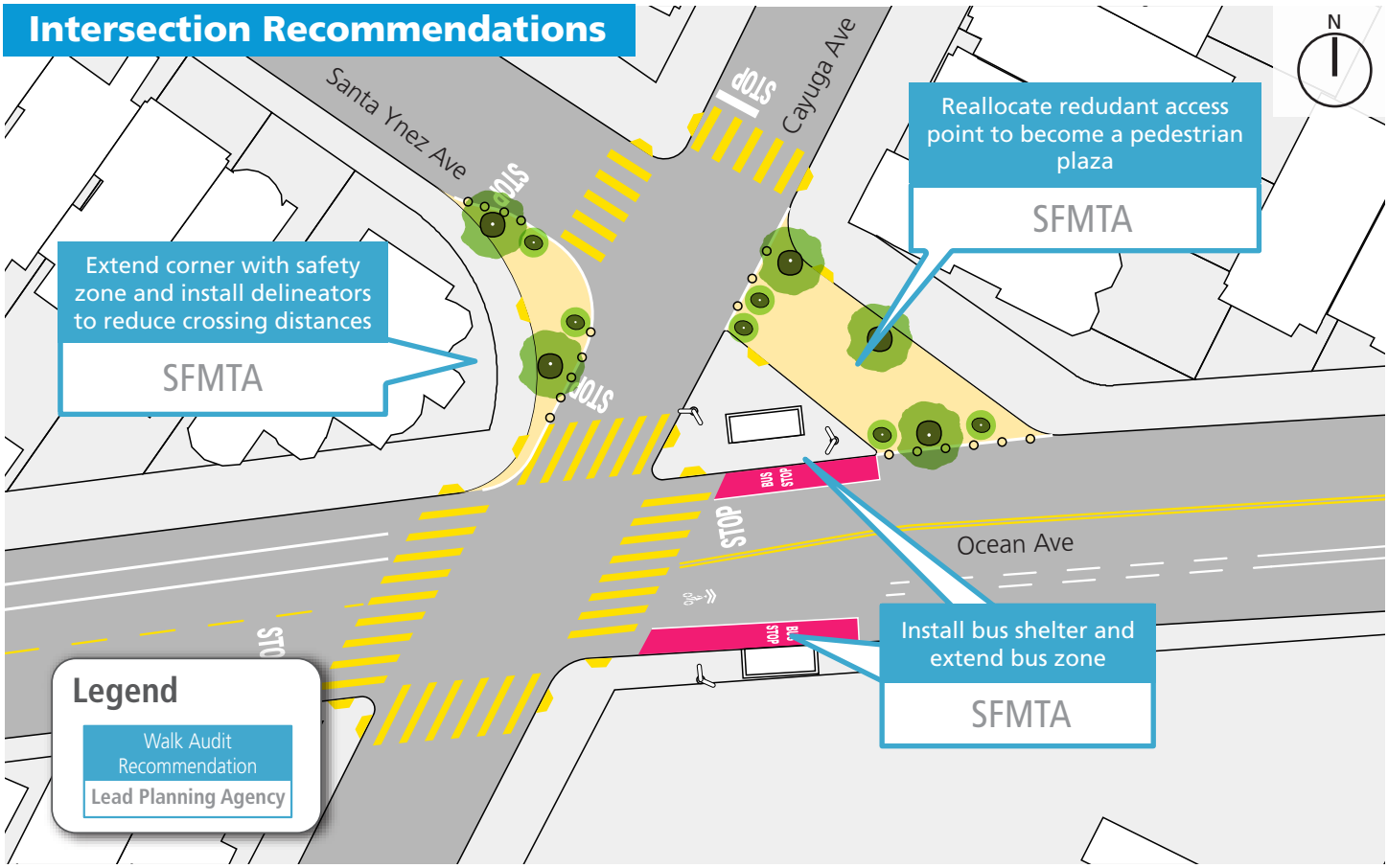
Focus Station Area Action Plan

4 Ocean Avenue & Cayuga Avenue

Intersection Context

- The intersection of Santa Ynez Avenue / Cayuga Avenue / Ocean Avenue is currently designed to prioritize vehicle access. It features redundant access points and wide curb radii. These design elements create multiple conflict points and encourage high speeds, making pedestrian access less safe.
- Three crashes were recorded near this intersection from 2019 to 2023: two were vehicle-to-vehicle collisions, and one was a bike collision due to poor lighting.

Intersection Recommendations



Safety Benefits

FHWA Tier 1 Safety Countermeasures to Remove Severe Conflicts:

- Extending the curb reduces pedestrian crossing distance and exposure time.
- Closing a redundant access point to vehicles consolidates opposing movements to fewer locations and reduces the likelihood of a collision.

FHWA Tier 2 Safety Countermeasures to Reduce Vehicle Speeds:

- Bulb-outs reduce the width of the roadway, and encourage slower, tighter turns.

FHWA Tier 4 Safety Countermeasures to Increase Attentiveness and Awareness:

- Improving lighting increases visibility for pedestrians, bicyclists, and drivers, particularly at approaches to crossings.

Estimated Capital Cost

$200,000

In US Dollars 2025

Balboa Park

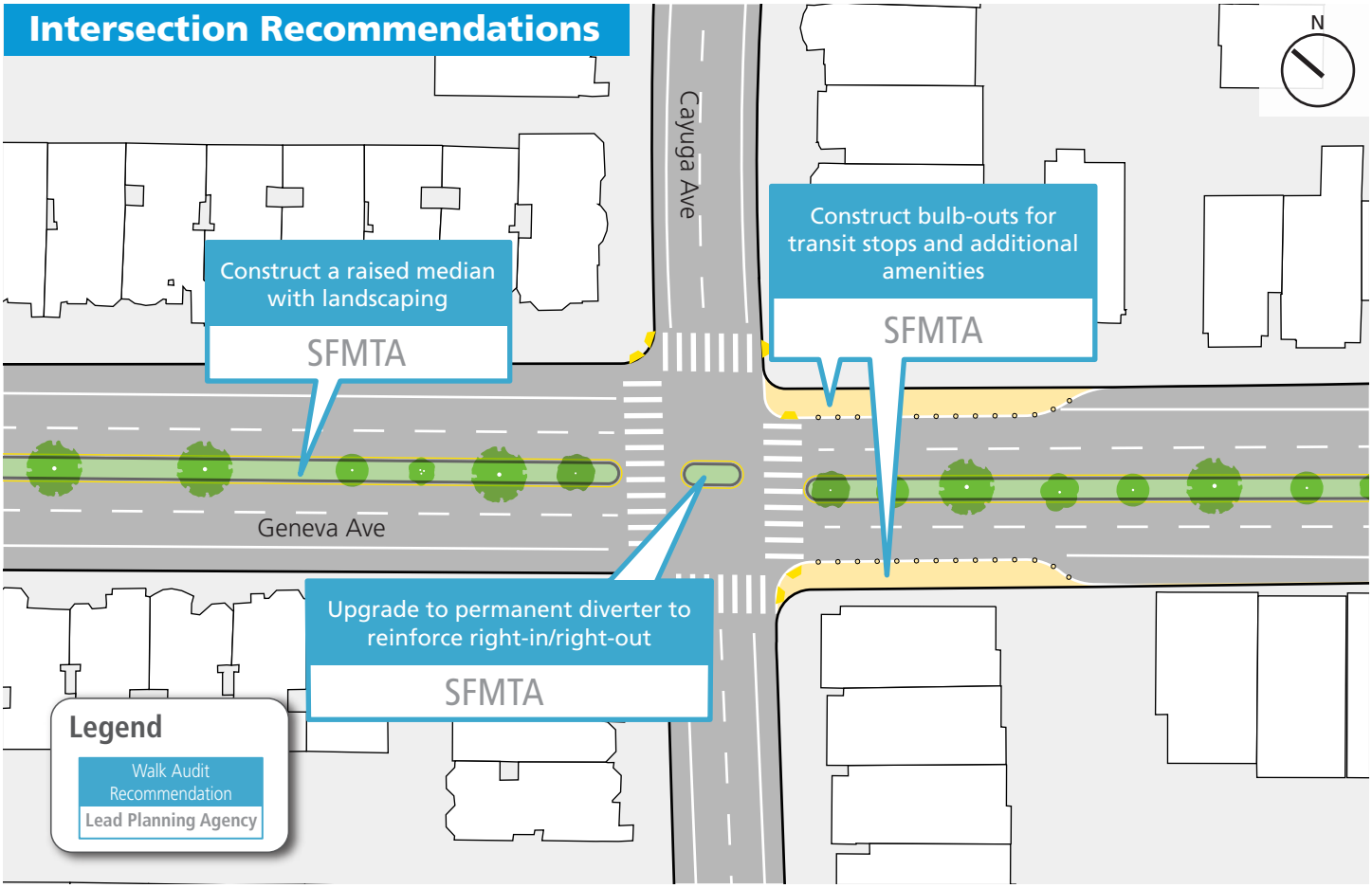
Focus Station Area Action Plan

5 Geneva Avenue & Cayuga Avenue

Intersection Context

- Geneva Avenue and Cayuga Avenue is an intersection of a busy vehicle corridor and a "Slow Street" that serves as a community connection to parks, playgrounds, and schools.
- Two collisions resulted in severe injuries at this location, one due to a vehicle turning left from eastbound Geneva Avenue to northbound Cayuga Avenue.

Intersection Recommendations



Safety Benefits

FHWA Tier 1 Safety Countermeasures to Remove Severe Conflicts:

- Raised medians provide physical separation between opposing travel lanes and may serve as pedestrian refuges, allowing pedestrians to focus on crossing one direction of traffic at a time.
- Bus bulbs reduce pedestrian crossing distances and also enable buses to service a stop without merging in and out of travel lanes.
- Traffic diverters reduce cut through traffic and physically restrict left turns, reducing conflict exposure.

FHWA Tier 2 Safety Countermeasures to Reduce Vehicle Speeds:

- Bus bulbs and medians reduce the width of the roadway and encourage slower speeds.

Estimated Capital Cost

$100,000*

In US Dollars 2025

*Does not include median cost; median cost included on Page 4

Coliseum

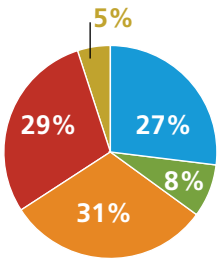
Focus Station Area Action Plan

Station at a Glance

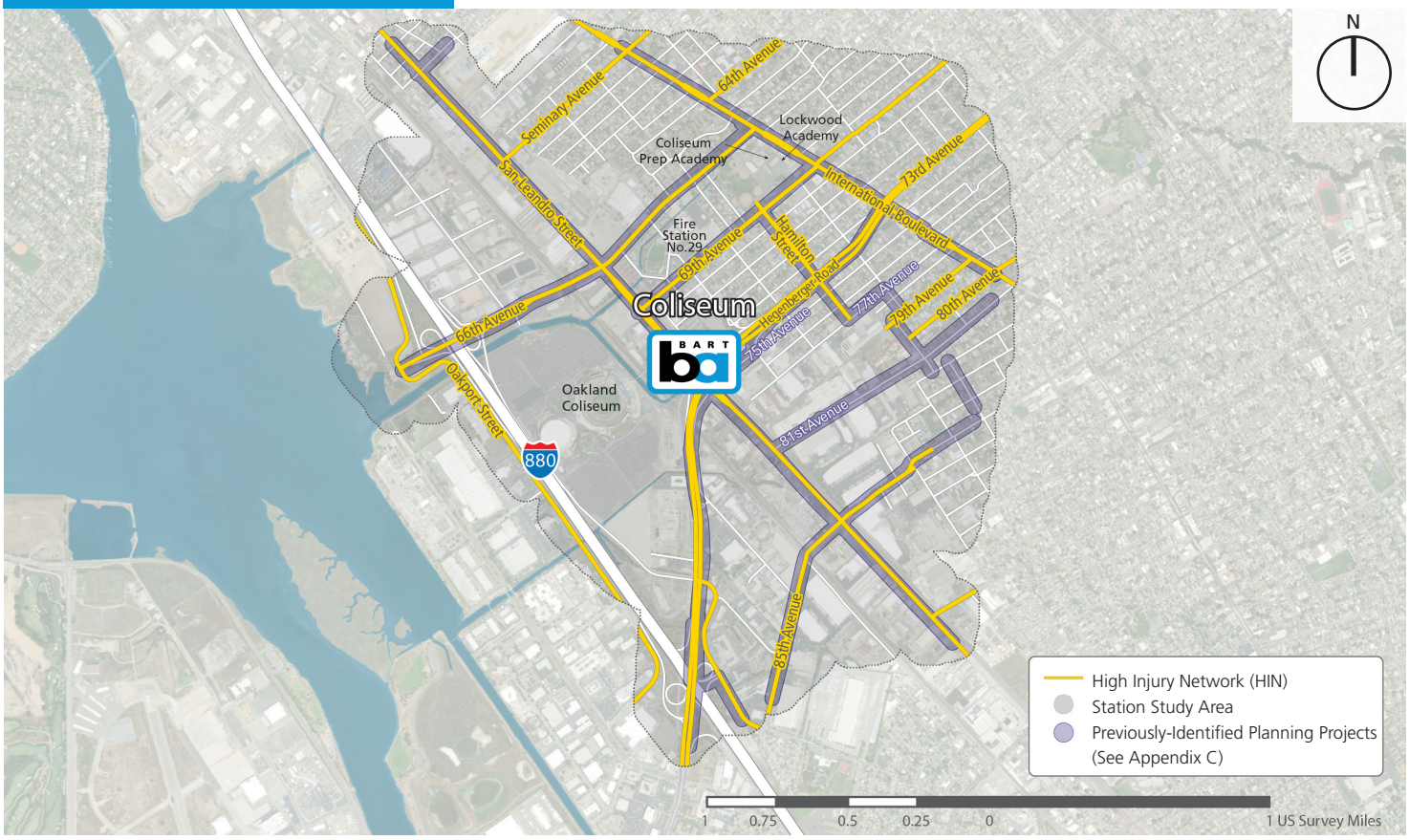
Station Access Type: Urban

Access Mode Share

- Walk
- Transit
- Bicycle
- Drive Alone / Carpool
- Drop Off / Taxi / Other



Station Area Map



Jurisdiction(s) with roads on HIN: City of Oakland, County of Alameda, and Caltrans

Safety by the Numbers

5-year Collision Data: 2019-2023

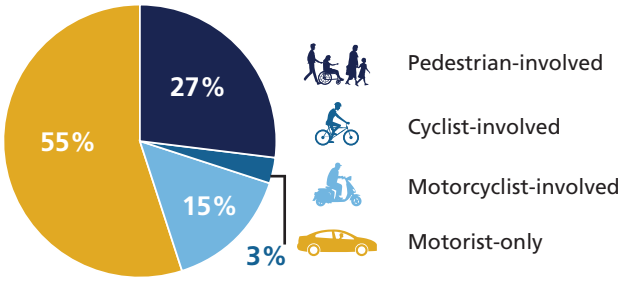
31% Percent of Station study area street miles on the HIN

64 Number of people killed or severely injured (KSI)

9% Percent of crashes that resulted in KSI

Killed/Severe Injury (KSI) Crashes

Total KSI: 64



Coliseum

Focus Station Area Action Plan

Key Corridors and Intersections

Jurisdiction(s) with roads on HIN: City of Oakland, County of Alameda, Caltrans

1. **66th Avenue from San Leandro Street to International Boulevard**
2. **Snell St from 70th Ave to 69th Ave; 69th Ave at Lion Way**
3. **International Boulevard from 66th Avenue to 73rd Avenue**
4. **Hegenberger Road & Hamilton Street**
5. **Snell Street & 75th Street**

Coliseum

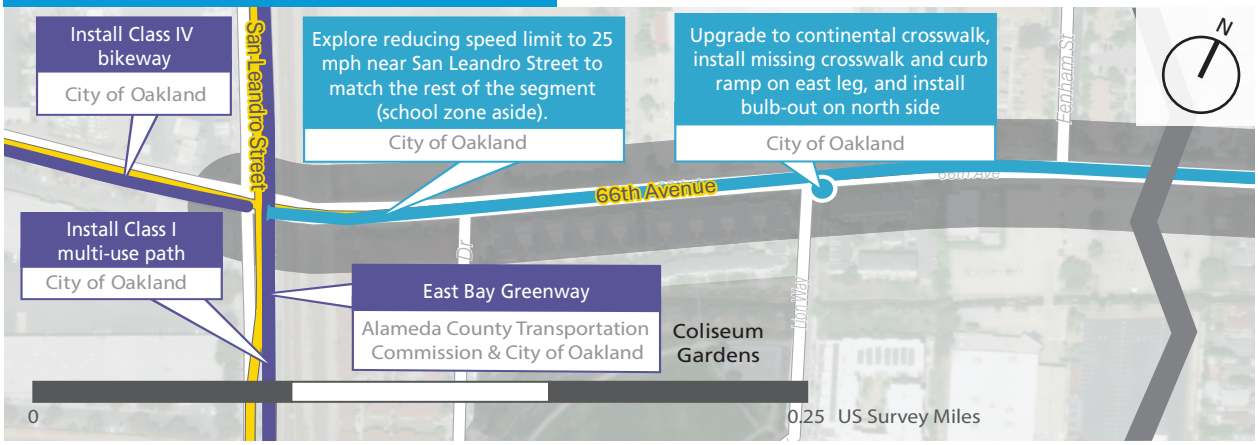
Focus Station Area Action Plan

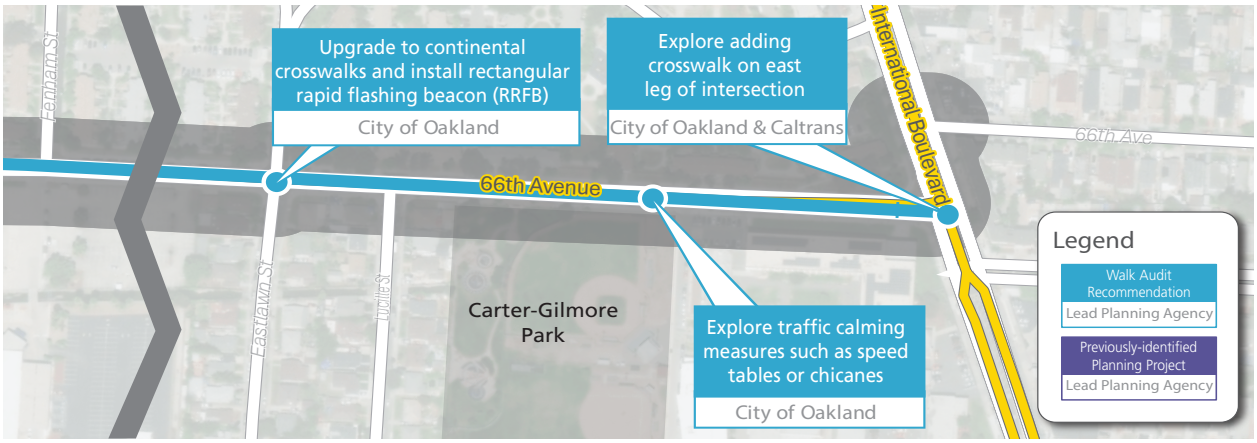
1 66th Avenue from San Leandro Street to International Boulevard

Corridor Context

- 66th Avenue runs northeast from San Leandro Boulevard and is flanked by several schools, a church, and a fire station.
- The corridor has no stop or signal controls for 0.5 miles between San Leandro Street and International Boulevard. This encourages drivers to travel fast along this segment and makes it difficult for pedestrians to cross.
- There were 17 collisions on this corridor from 2019 to 2023, with two involving a pedestrian. The most common violations resulting in collisions were right-of-way infractions, improper turning, and failure to comply with traffic signs and signals.

Corridor Recomendations





Safety Benefits

FHWA Tier 1 Safety Countermeasures to Remove Severe Conflicts:

- Additional marked crossing opportunities encourage pedestrians to cross where they will be most visible.

FHWA Tier 2 Safety Countermeasures to Reduce Vehicle Speeds:

- Traffic calming measures reduce vehicle speeds and enable vehicles to react to potential conflicts.

FHWA Tier 4 Safety Countermeasures to Increase Attentiveness and Awareness:

- Rectangular rapid flashing beacons (RRFBs) and high-visibility continental crosswalks make crossing pedestrians more visible to drivers.

Estimated Capital Cost

$100,000

In US Dollars 2025

Coliseum

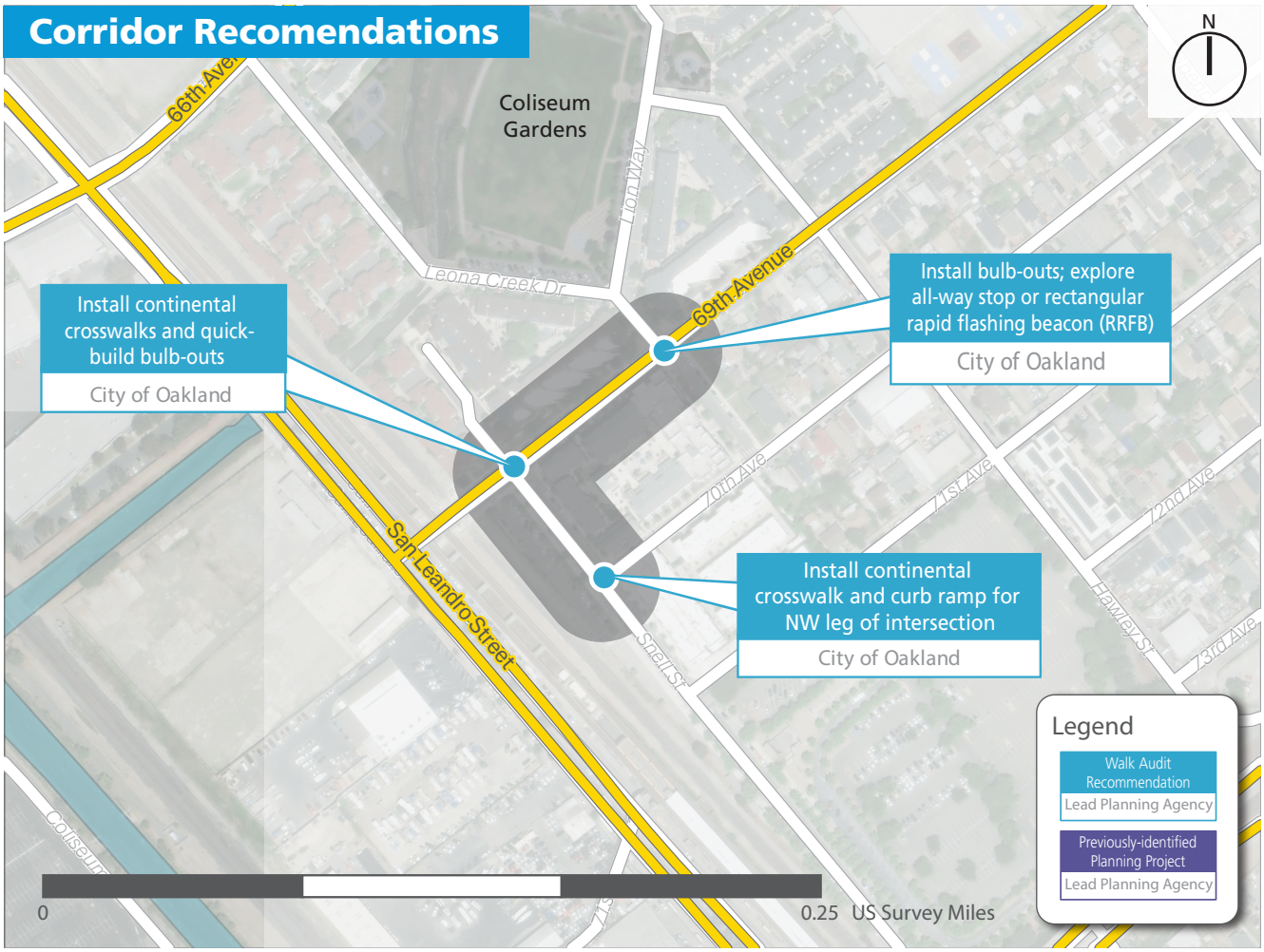
Focus Station Area Action Plan

2 Snell St from 70th Ave to 69th Ave; 69th Ave at Lion Way

Corridor Context

- Snell Street and 69th Avenue meet to provide a connection between the Coliseum BART station and the Coliseum Gardens, a park providing recreation space nearby the schools and church on 66th Avenue.
- Survey respondents identified Snell Street as a corridor where they have roadway safety concerns.

Corridor Recomendations



Safety Benefits

FHWA Tier 1 Safety Countermeasures to Remove Severe Conflicts:

- Bulb-outs reduce pedestrian crossing distance and exposure to passing vehicles.

FHWA Tier 2 Safety Countermeasures to Reduce Vehicle Speeds:

- Bulb-outs reduce the width of the roadway and encourage drivers to reduce speed.

FHWA Tier 3 Safety Countermeasures to Manage Conflicts in Time:

- An all-way stop requires vehicles to stop before proceeding through the intersection, reducing the likelihood of a collision.

FHWA Tier 4 Safety Countermeasures to Increase Attentiveness and Awareness:

- Rectangular rapid flashing beacons (RRFBs) and high-visibility continental crosswalks make crossing pedestrians more visible to drivers.

Estimated Capital Cost

$50,000

In US Dollars 2025

Coliseum

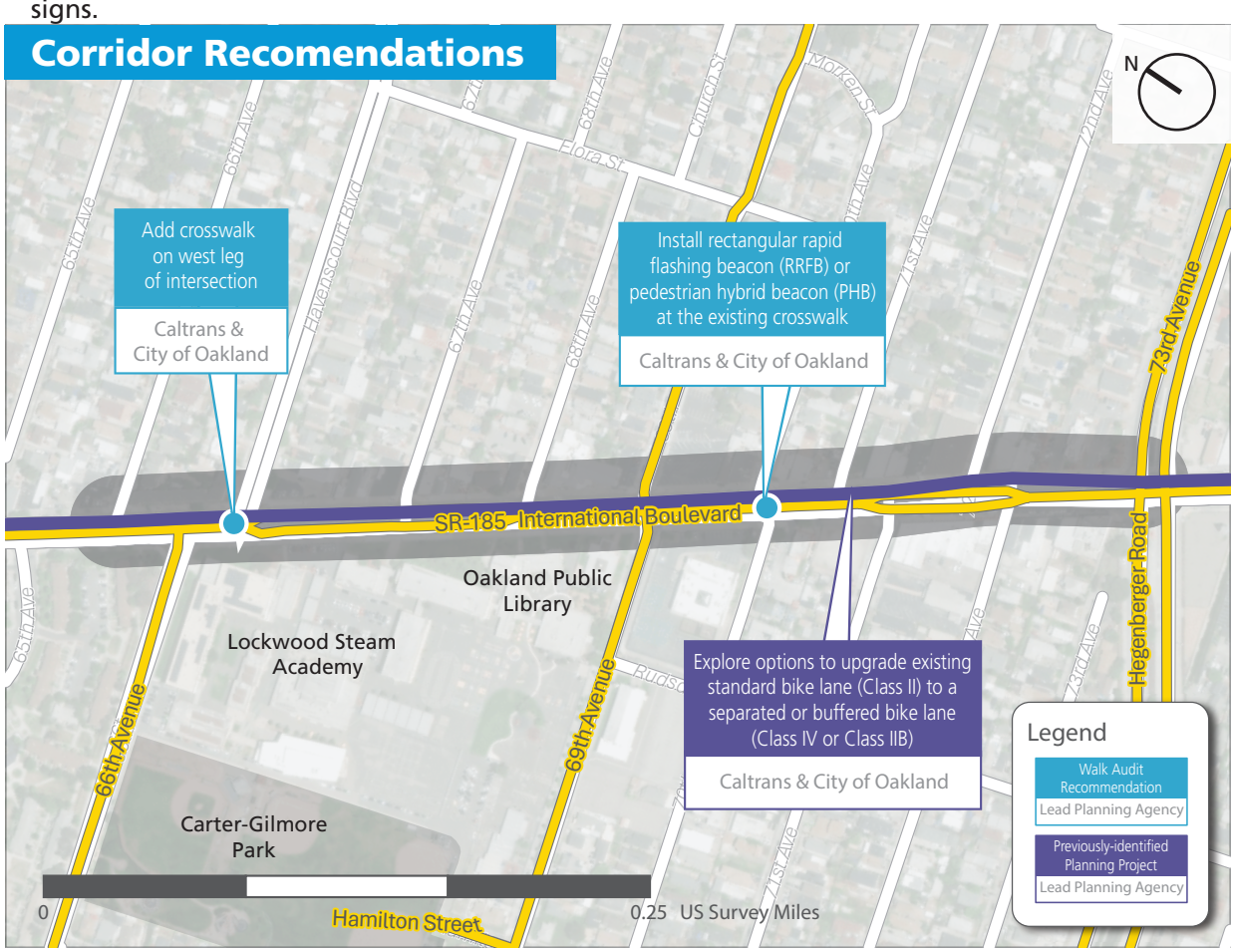
Focus Station Area Action Plan

3 International Boulevard from 66th Avenue to 73rd Avenue

Corridor Context

- International Boulevard is a multilane road with median bus stops and bus lanes served by AC Transit. Recomendations will need to be coordinated with AC Transit.
- The south side of the corridor between 66th Avenue and 69th Avenue is especially busy during school drop-off and pick-up times due to adjacent elementary and high schools along this block.
- There were 60 collisions along this corridor between 2019 and 2023; nine involved a pedestrian. The most common violation was unsafe speed, followed closely by improper turning and failure to obey traffic signals and signs.

Corridor Recomendations



Safety Benefits

FHWA Tier 1 Safety Countermeasures to Remove Severe Conflicts:

- Additional crossing opportunities encourage pedestrians to cross where they are most visible to drivers.

FHWA Tier 2 Safety Countermeasures to Reduce Vehicle Speeds:

- The existing speed feedback sign is not visible to drivers as it is blocked by a signal pole. Relocating the sign will allow it to be effective at reducing speed along the corridor.

FHWA Tier 4 Safety Countermeasures to Increase Attentiveness and Awareness:

- Rectangular rapid flashing beacons (RRFBs) can significantly increase motorist yielding rates and draw attention to crossing pedestrians.

Estimated Capital Cost

$50,000

In US Dollars 2025

Coliseum

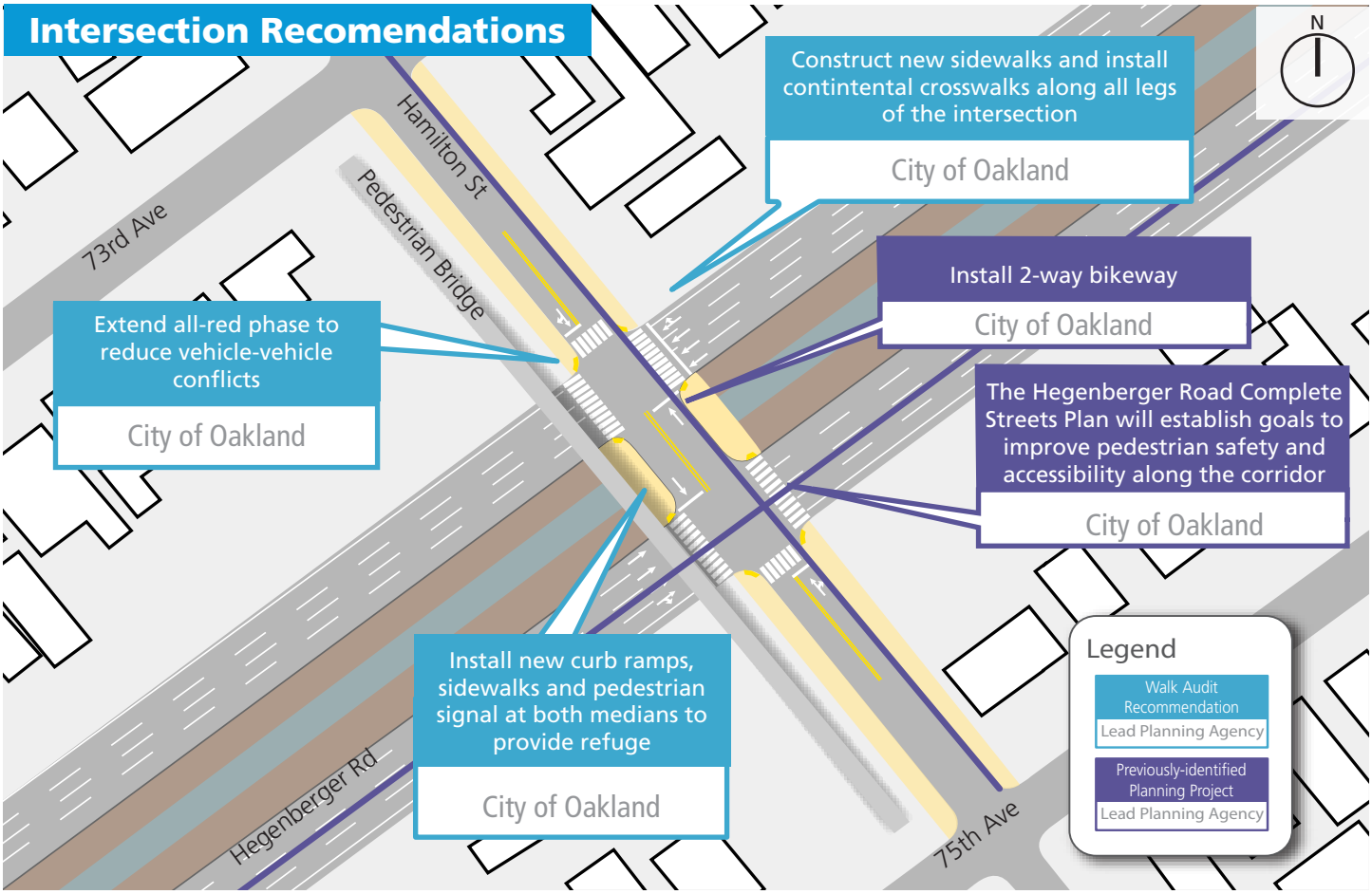
Focus Station Area Action Plan

4 Hegenberger Road & Hamilton Street

Intersection Context

- Hegenberger Road is an 8-lane roadway running east-west through the station area. The pedestrian overcrossing at Hamilton Street features a steep grade (as observed during the walk audit) and does not adequately address the safety challenges at this intersection.
- 24 collisions were recorded at this intersection from 2019 to 2023 resulting in three fatal and severe injuries. Over 60% were broadside collisions, and the majority of collisions were attributed to violations of traffic signs and signals or improper turning.
- Recommendations should be coordinated with AC Transit to minimize operational impacts.

Intersection Recomendations



Safety Benefits

FHWA Tier 1 Safety Countermeasures to Remove Severe Conflicts:

- Constructing sidewalks and installing an at-grade crossing with a median refuge and high-visibility continental crosswalks at this intersection will enable safer crossings for those who cannot or choose not to use the pedestrian bridge. This will provide additional safety benefits to children, seniors, and people with disabilities.

FHWA Tier 3 Safety Countermeasures to Manage Conflicts in Time:

- Increasing the all-red phase at this signalized intersection may reduce conflicts between opposing vehicle movements.

Estimated Capital Cost

$400,000

In US Dollars 2025

Coliseum

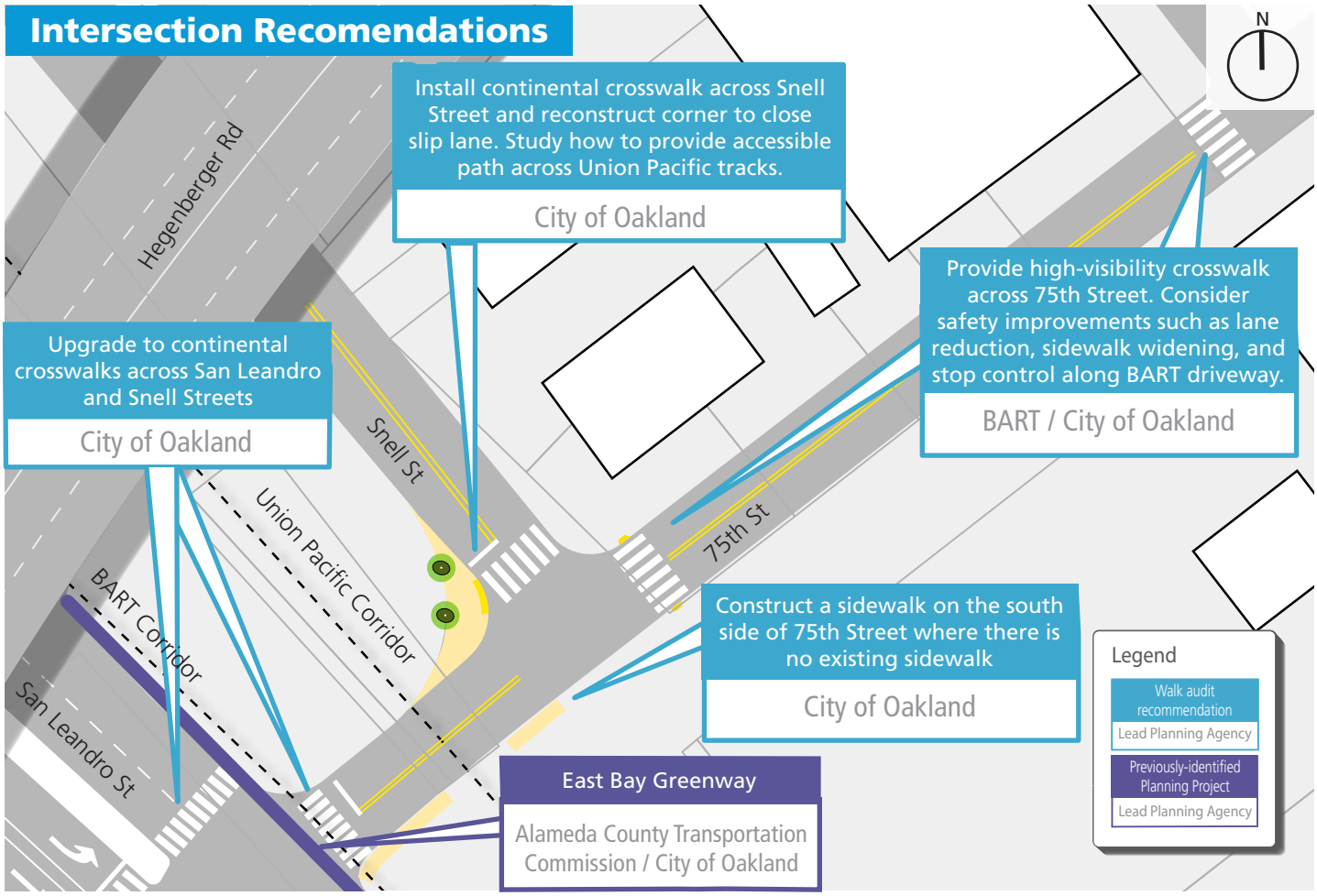
Focus Station Area Action Plan

5 Snell Street & 75th Street

Intersection Context

- Snell Street meets 75th Street just south of the BART station. The intersection has a slip lane from Snell Street to 75th Street, no marked pedestrian crossing, and stretches of missing sidewalks.
- For BART riders who live south of Hegenberger Road, 75th Street is the most efficient path to access the station.
- There were 12 collisions recorded at or near this intersection between 2019-2023, with one involving a pedestrian.

Intersection Recomendations



Safety Benefits

FHWA Tier 1 Safety Countermeasures to Remove Severe Conflicts:

- Accessible sidewalks provide a space for pedestrians to travel that is separated from vehicle traffic.
- Closing the slip lane at Snell Street reduces the crossing distance.

FHWA Tier 2 Safety Countermeasures to Reduce Vehicle Speeds:

- Closing the slip lane at Snell Street will reduce vehicle speeds as they turn right onto 75th Street.

FHWA Tier 4 Safety Countermeasures to Increase Attentiveness and Awareness:

- Installing high-visibility continental crosswalks will increase pedestrian visibility.

Estimated Capital Cost

$100,000

In US Dollars 2025

Colma

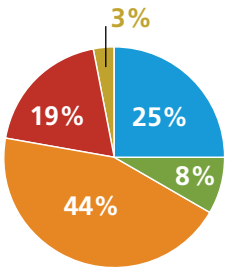
Focus Station Area Action Plan

Station at a Glance

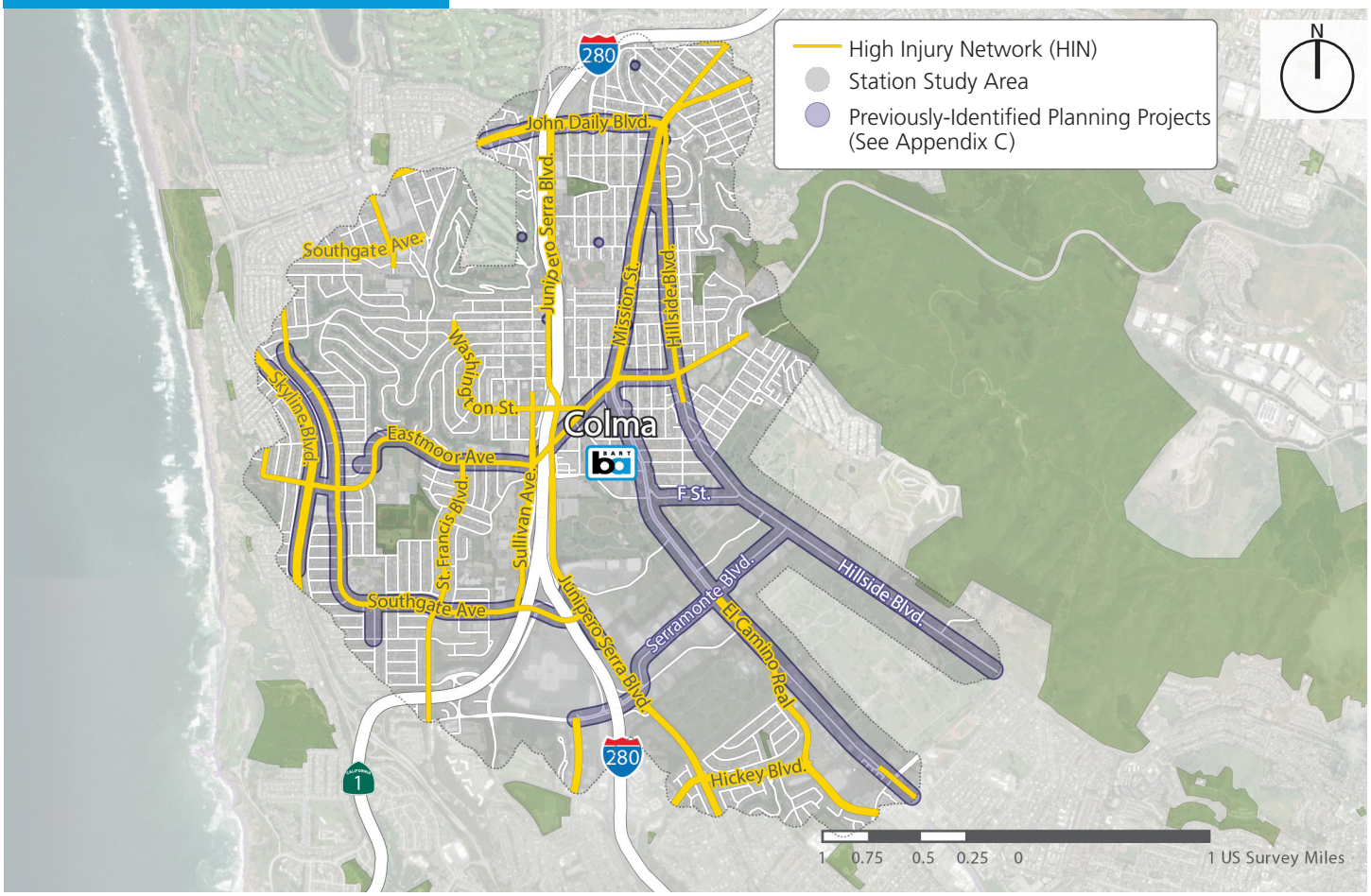
Station Access Type: Intermodal - Auto Reliant

Access Mode Share

- Walk
- Transit
- Bicycle
- Drive Alone / Carpool
- Drop Off / Taxi / Other



Station Area Map



Jurisdiction(s) with roads on HIN: Town of Colma, City of Daly City, San Mateo County, Caltrans

Safety by the Numbers

5-year Collision Data: 2019-2023

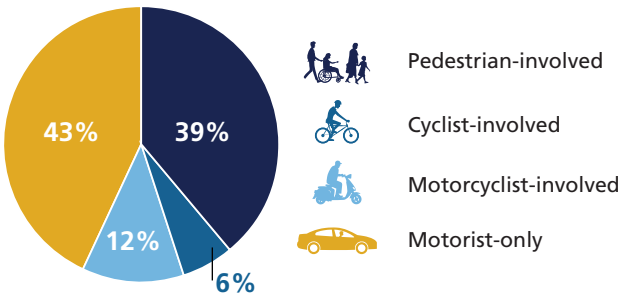
20% Percent of Station study area street miles on the HIN

66 Number of people killed or severely injured (KSI)

9% Percent of crashes that resulted in KSI

Killed/Severe Injury (KSI) Crashes

Total KSI: 66



Colma

Focus Station Area Action Plan

Key Corridors and Intersections

Jurisdiction(s) with roads on HIN: Town of Colma, City of Daly City, San Mateo County, Caltrans

1 Albert M Teglia Boulevard at Colma BART to El Camino Real & A Street

2 San Pedro Road at Mission St to Washington St at Sullivan Ave

3 San Pedro Road & Mission Street

4 D Street & Hill Street

Colma

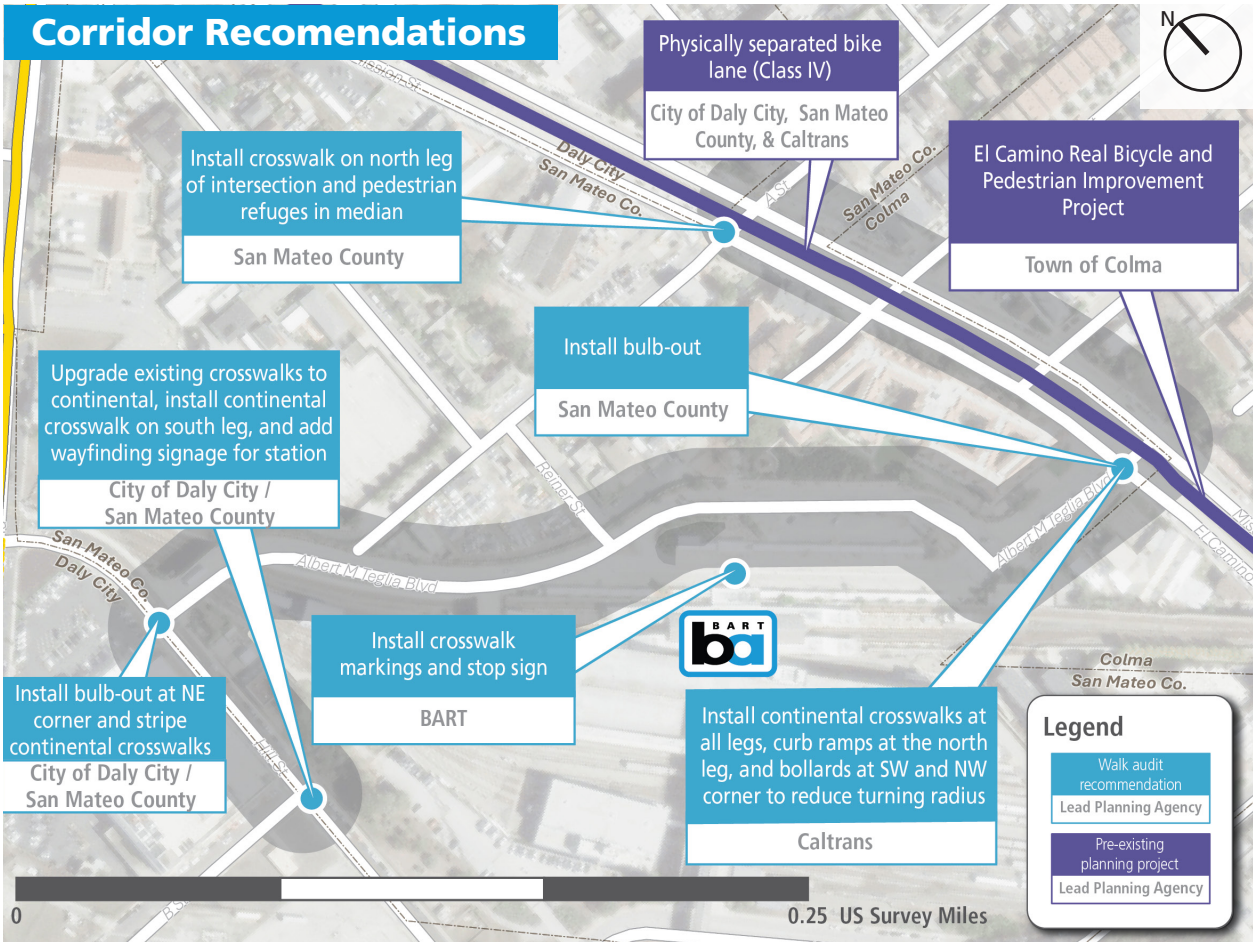
Focus Station Area Action Plan

1 Albert M Teglia Boulevard at Colma BART to El Camino Real & A Street

Corridor Context

- Albert M Teglia Boulevard is a local road in front of the main BART station entrance. Most people are likely using this road to access the BART station or buses that serve the station.
- Survey respondents reported pedestrian safety concerns at the intersection of Albert M Teglia Boulevard and Hill Street.
- SamTrans is sponsoring the first phase of development to transform El Camino Real into a 'safe, inviting, connected, and transit-oriented boulevard.' Implementation of all recommendations below should involve the relevant stakeholders at SamTrans, Caltrans, and the local jurisdictions.

Corridor Recomendations



Safety Benefits

FHWA Tier 1 Safety Countermeasures to Remove Severe Conflicts:

- Bulb-outs and median refuges reduce pedestrian crossing distance and exposure to vehicular conflicts.

FHWA Tier 2 Safety Countermeasures to Reduce Vehicle Speeds:

- Bulb-outs reduce the width of the roadway and turning radius, encouraging drivers to reduce speed.

FHWA Tier 4 Safety Countermeasures to Increase Attentiveness and Awareness:

- High-visibility continental crosswalks make crossing pedestrians more visible to drivers.

Estimated Capital Cost

$200,000

In US Dollars 2025

Colma

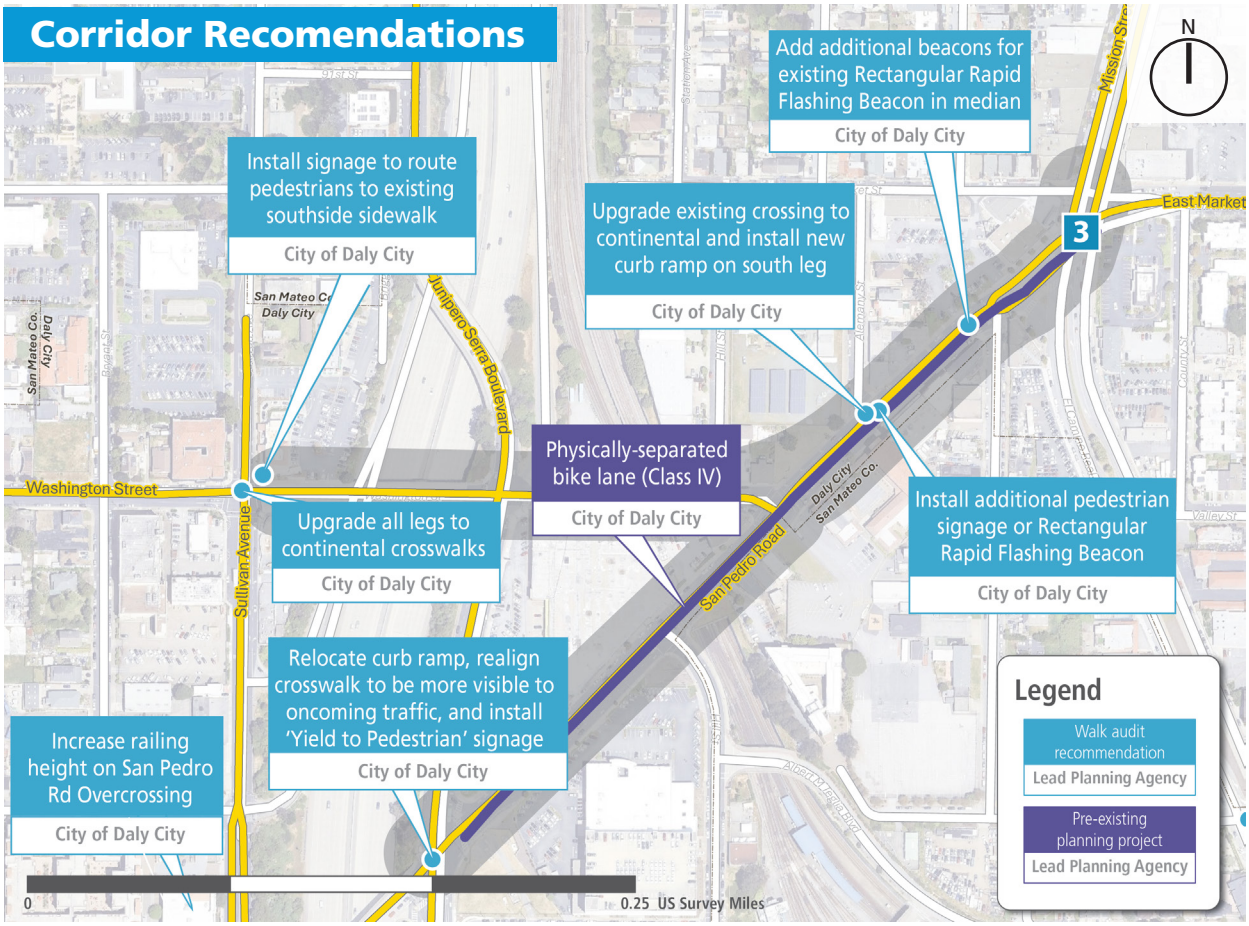
Focus Station Area Action Plan

2 San Pedro Road at Mission Street to Washington St at Sullivan Ave

Corridor Context

- San Pedro Road is a minor arterial and multimodal corridor with four lanes of traffic and three SamTrans routes (ECR, 24, and 130). There is a church and a school nearby. Survey respondents reported high volumes of traffic and difficulty biking on San Pedro Road.
- Mission Street is a north-south arterial that becomes El Camino Real (SR 82) south of San Pedro. At this intersection Mission Street has six lanes of traffic and a bus stop for SamTrans 130, ECR, and ECRO.
- Washington Street is an east-west collector street that provides a crossing over I-280 and the BART tracks. SamTrans route 122 runs along Washington Street between Junipero Serra Boulevard and Sullivan Avenue.

Corridor Recomendations



*All recommendations should be coordinated with SamTrans to ensure alignment.
**Increased railing height is not included in cost estimate.

Safety Benefits

FHWA Tier 1 Safety Countermeasures to Remove Severe Conflicts:

- Signage directing pedestrians to an existing sidewalk reduces the likelihood of pedestrians finding themselves in the vehicle right-of-way.
- Protected bicycle lane provides separation between drivers and bicyclists.

FHWA Tier 4 Safety Countermeasures to Increase Attentiveness and Awareness:

- High-visibility continental crosswalks improve pedestrian visibility and alert drivers to crossing pedestrians.
- Rectangular rapid flashing beacons (RRFBs) increase motorist yielding behavior at uncontrolled intersections.

Estimated Capital Cost

$100,000

In US Dollars 2025

Colma

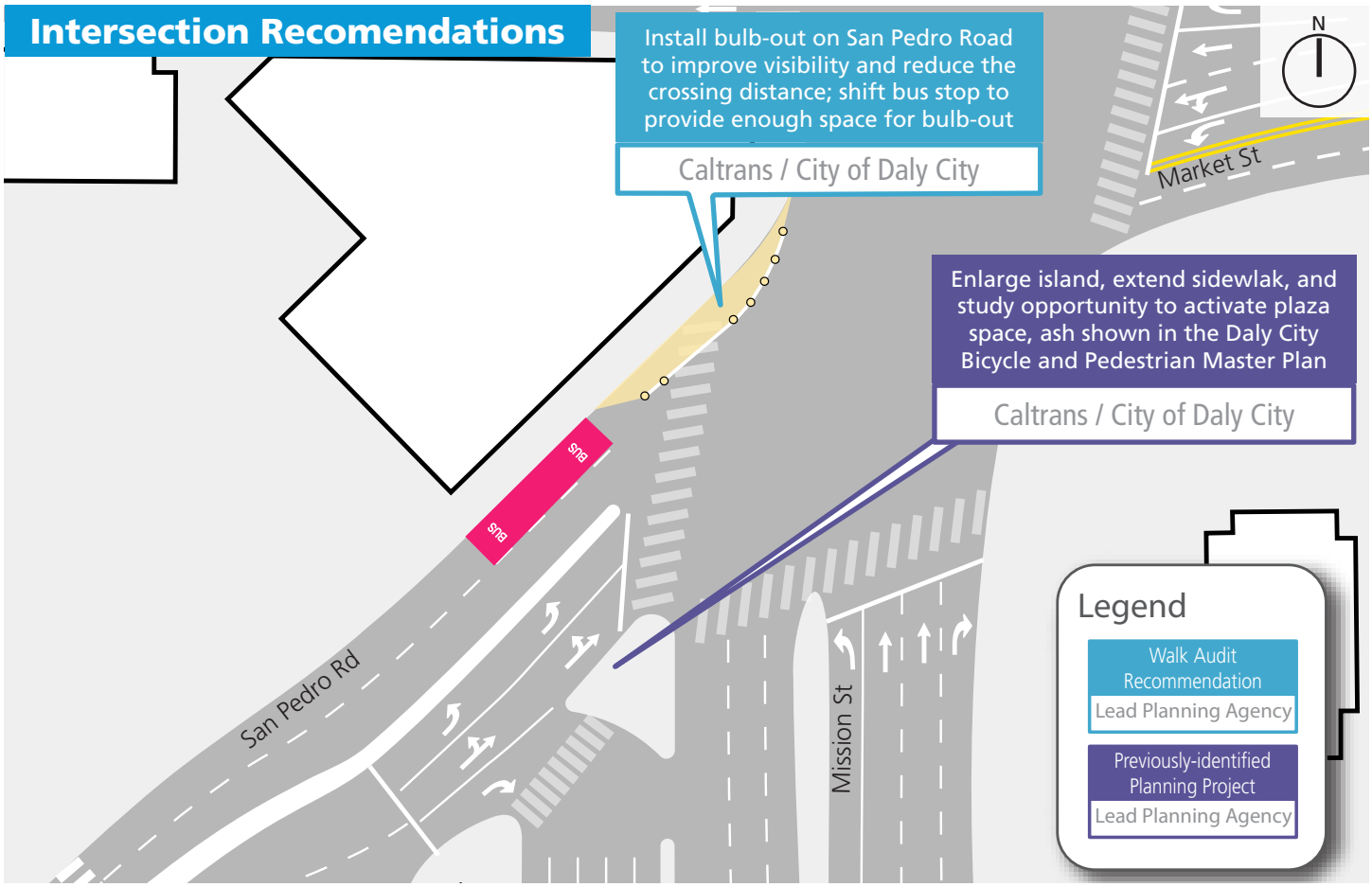
Focus Station Area Action Plan

3 San Pedro Road & Mission Street

Intersection Context

- San Pedro Road and Mission Street intersect with Market Street to form a complex 5-way intersection with wide pedestrian crossings. There is limited visibility on the approach from Mission Street to San Pedro Road due to the road geometry and the placement of a utility box on Mission Street before the curve.
- Sixteen collisions occurred at this intersection between 2019-2023, with three involving a pedestrian. The two primary violations were unsafe speeds and improper turning.

Intersection Recomendations



*All recommendations should be coordinated with Daly City, SamTrans, and Caltrans to maintain alignment with the Mission Street Corridor Study and the Daly City Bicycle and Pedestrian Master Plan.

Safety Benefits

FHWA Tier 1 Safety Countermeasures to Remove Severe Conflicts:

- Closing the slip lane eliminates conflicts between vehicles and pedestrians.
- Bulb-outs result in shorter crossing distances which reduce pedestrian exposure time in the intersection.

FHWA Tier 2 Safety Countermeasures to Reduce Vehicle Speeds:

- Closing the slip lane requires a slower right turn onto Mission Street.
- Bulb-outs reduce the width of the roadway and encourage drivers to reduce speed.

FHWA Tier 4 Safety Countermeasures to Increase Attentiveness and Awareness:

- High-visibility crosswalks improve pedestrian visibility and alert drivers to crossing pedestrians.

Estimated Capital Cost

$10,000 (Quick Build) - $50,000

In US Dollars 2025

Colma

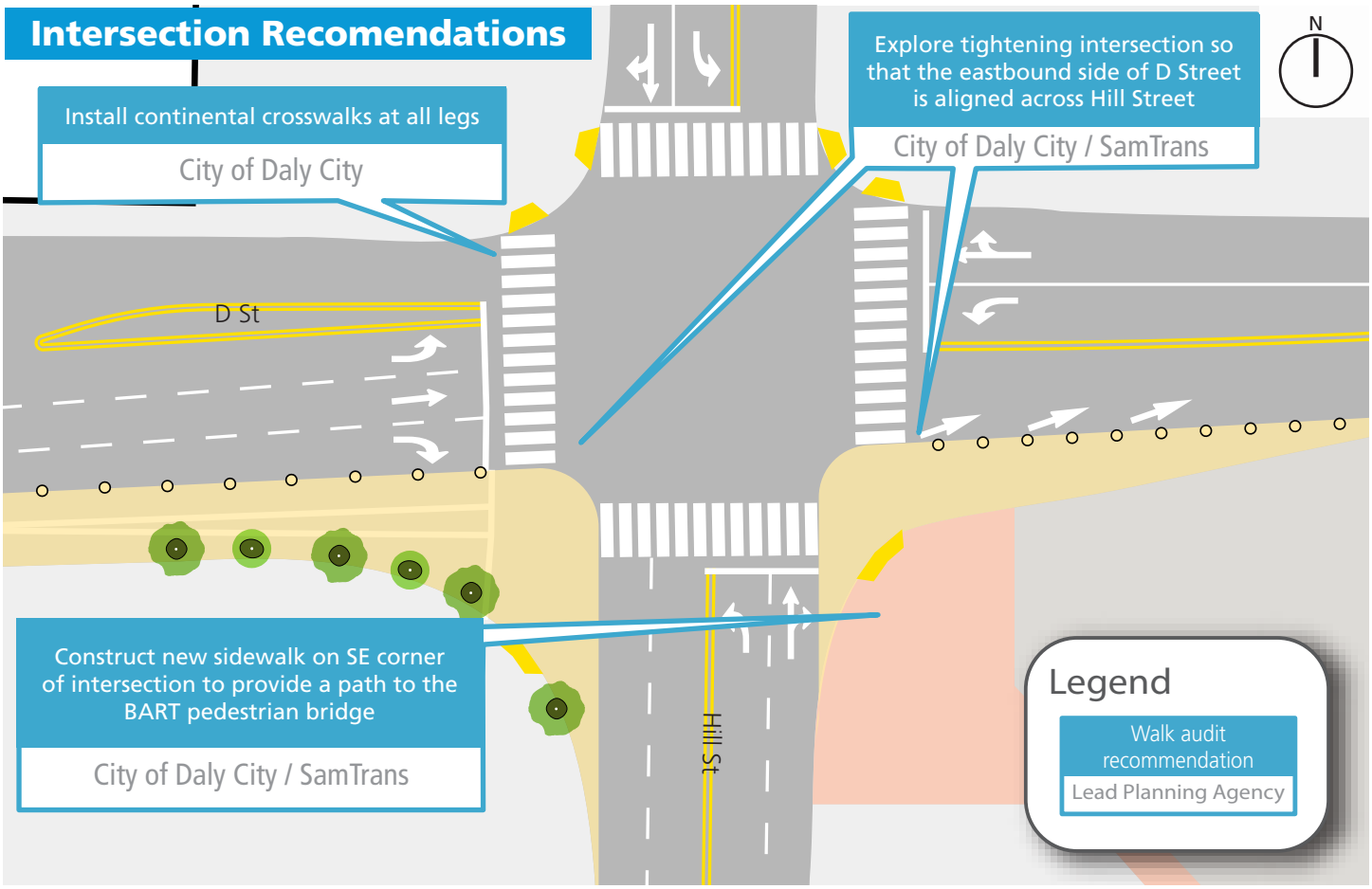
Focus Station Area Action Plan

4 D Street & Hill Street

Intersection Context

- D Street and Hill Street is an intersection located northwest of Colma station. Hill Street ends in the station's Park & Ride lot south of D Street.
- The existing intersection alignment does not provide crossing opportunities across the south or east legs of the intersection.
- There was one head-on collision resulting in a visible injury between 2019-2023.

Intersection Recomendations



*All recommendations should be coordinated with relevant SamTrans projects to ensure alignment.

Safety Benefits

FHWA Tier 2 Safety Countermeasures to Reduce Vehicle Speeds:

- The intersection realignment involves reducing turning radii at the southeast and southwest corners, encouraging reduced vehicle speeds around the turns.
- Narrower travel lanes also encourage slower speeds.

FHWA Tier 4 Safety Countermeasures to Increase Attentiveness and Awareness:

- The intersection realignment enables better visibility for all modes.
- High-visibility continental crosswalks increase pedestrian visibility.

Estimated Capital Cost

$100,000

In US Dollars 2025

Concord

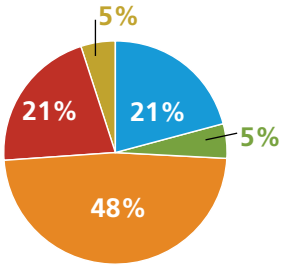
Focus Station Area Action Plan

Station at a Glance

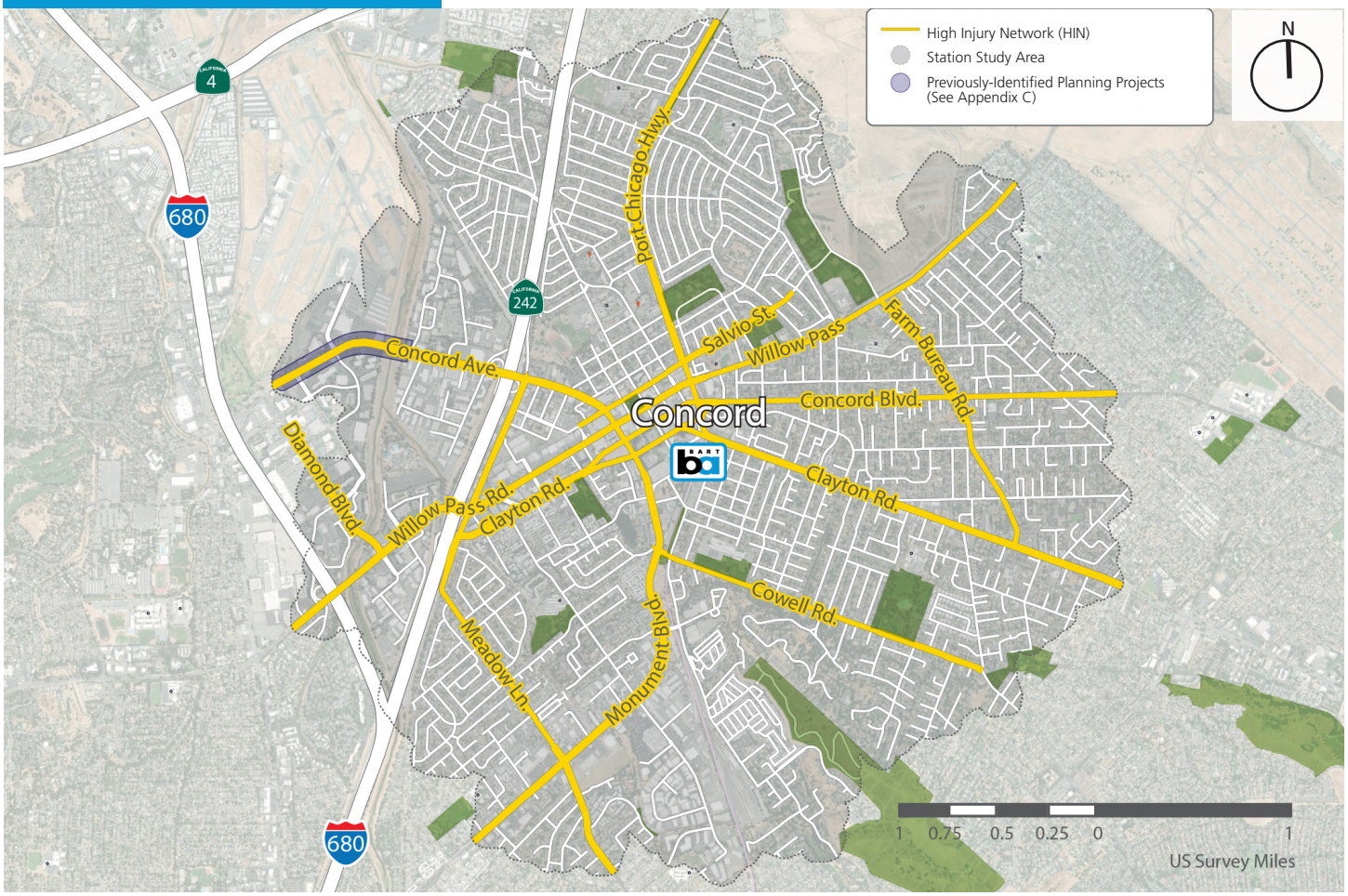
Station Access Type: Intermodal - Auto Reliant

Access Mode Share

- Walk
- Transit
- Bicycle
- Drive Alone / Carpool
- Drop Off / Taxi / Other



Station Area Map



Jurisdiction(s) with roads on HIN: City of Concord, Contra Costa County, and Caltrans

Safety by the Numbers

5-year Collision Data: 2019-2023

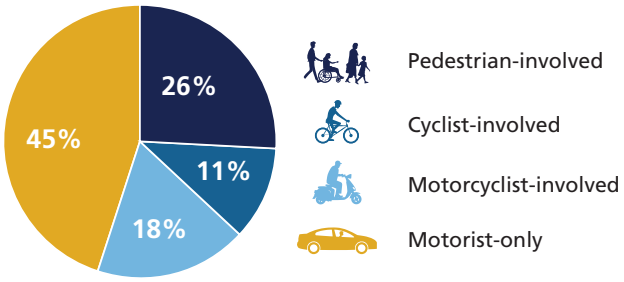
18% Percent of Station study area street miles on the HIN

95 Number of people killed or severely injured (KSI)

8% Percent of crashes that resulted in KSI

Killed/Severe Injury (KSI) Crashes

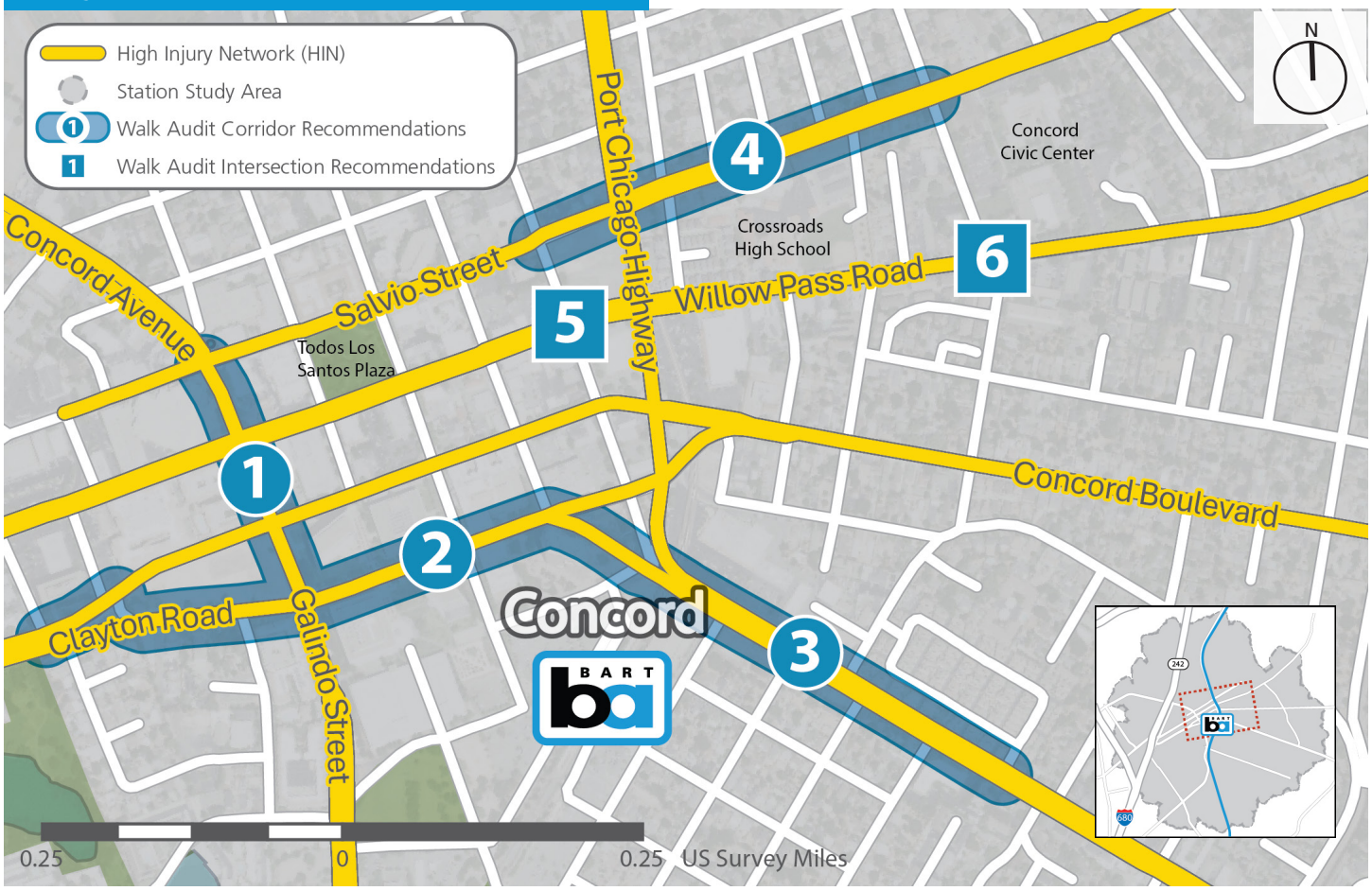
Total KSI: 95



Concord

Focus Station Area Action Plan

Key Corridors and Intersections



Jurisdiction(s) with roads on HIN: City of Concord, Contra Costa County, and Caltrans

1. **Galindo St from Salvio St to Clayton Rd; Willow Pass Rd**
2. **Clayton Road from Sutter Street to Grant Street**
3. **Clayton Road from Park St to The Alameda; Sunset St and East St**
4. **Salvio Street from East Street to Parkside Drive**
5. **Willow Pass Road & East Street**
6. **Willow Pass Road & Parkside Drive**

Concord

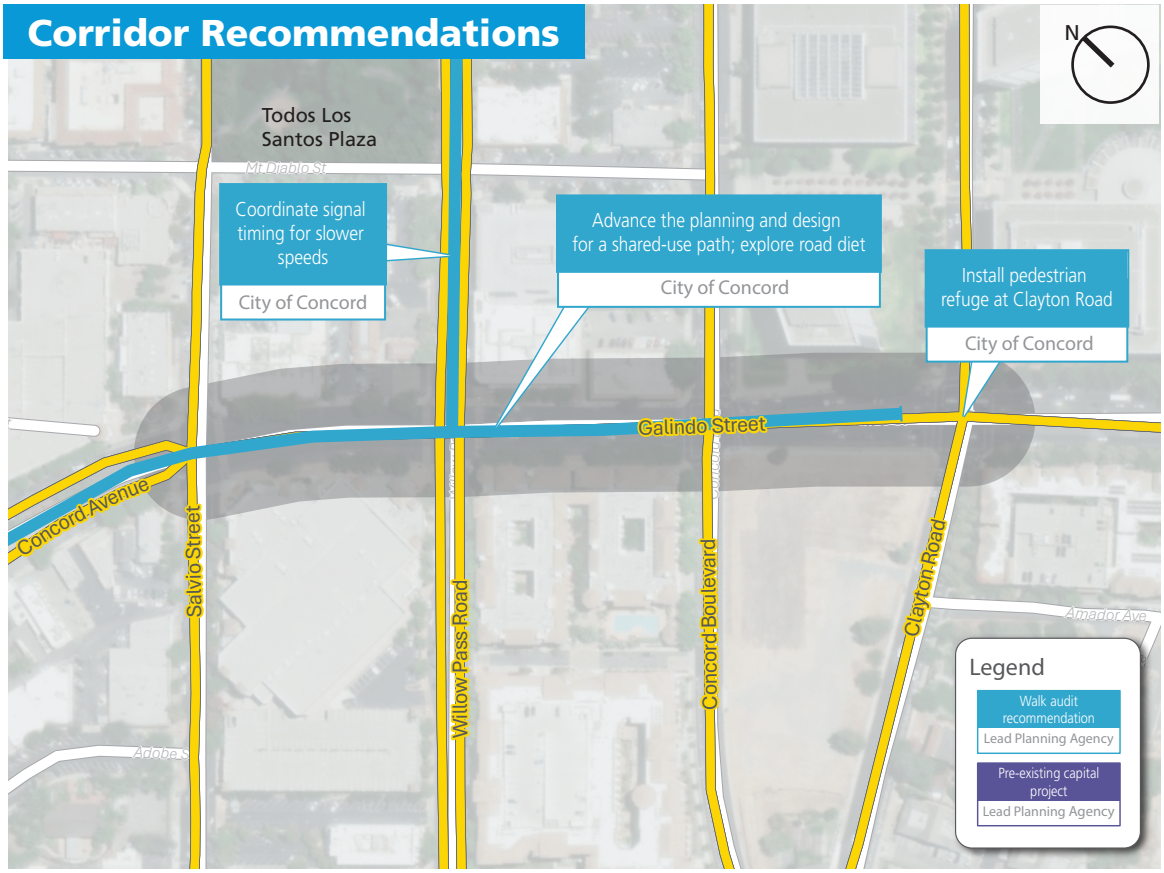
Focus Station Area Action Plan

1 Galindo St from Salvio St to Clayton Rd; Willow Pass Rd

Corridor Context

- This north-south arterial serves a high volume of vehicle traffic and has a speed limit of 30-35 mph. There are long-term plans to construct a shared-use path on the east side of the corridor to provide bicycle access to BART.
- The City identified three intersections on Galindo Street for the walk audit that were on the top ten list for total collisions (Galindo Street at Clayton Street, Concord Boulevard, and Willow Pass Road).
- There is pedestrian activity on nearby Willow Pass Road where there are also has high volumes of fast cars.
- There have been 78 collisions on this corridor from 2019 to 2023. The primary collision factors were traffic signal violations and unsafe speeds.

Corridor Recommendations



Safety Benefits

FHWA Tier 1 Safety Countermeasure to Remove Severe Conflicts:

- A shared use path that is physically separated from vehicle traffic will provide safety and access benefits for people to bicycle to and from BART.
- Road diets reduce the number and width of vehicle lanes, which can help reduce vehicle speeds and allow for additional pedestrian and bicyclist safety treatments.

FHWA Tier 2 Safety Countermeasure to Reduce Vehicle Speeds:

- Coordinated signal timing can manage vehicle speeds, increasing pedestrian safety. It can also create a steady and predictable flow of traffic, minimizing abrupt stops and starts that can lead to rear-end collisions.

Estimated Capital Cost

$40,000

In US Dollars 2025

Concord

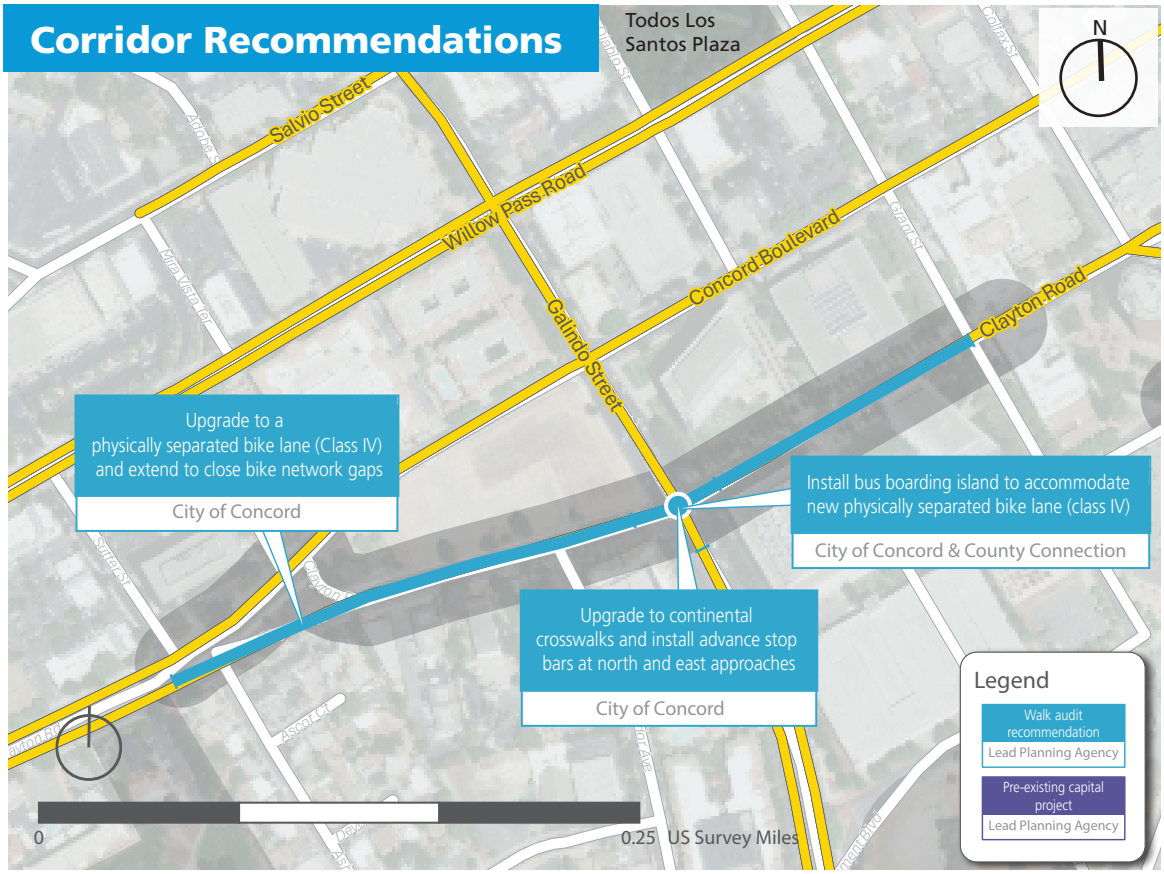
Focus Station Area Action Plan

2 Clayton Road from Sutter Street to Grant Street

Corridor Context

- Clayton Road is a one-way arterial with five travel lanes that runs adjacent to many office buildings in downtown Concord. A buffered bike lane is provided between Sutter and Grant Streets and is not yet connected into the surrounding bike network. Current best practice is to provide a higher degree of physical separation from vehicle traffic and to close gaps in the bike network.
- Multiple survey respondents reported safety concerns on Clayton Road, citing fast cars and lack of bicycle facilities.
- There were 42 collisions reported on this corridor from 2019 to 2023, with one resulting in a fatality. Over 50% of collisions were broadside collisions.

Corridor Recommendations



Safety Benefits

FHWA Tier 1 Safety Countermeasure to Remove Severe Conflicts:

- Physically separated bicycle lanes will provide more separation between bicyclist and vehicles to reduce chance for severe conflicts.

FHWA Tier 4 Safety Countermeasure to Increase Attentiveness and Awareness:

- High-visibility crosswalks and advance stop bars increase the visibility of pedestrians at marked crosswalks.
- Advance stop bars improve visibility of crossing pedestrians by increasing the distance between stopped motorists and crossing pedestrians.

Estimated Capital Cost

$100,000

In US Dollars 2025

Concord

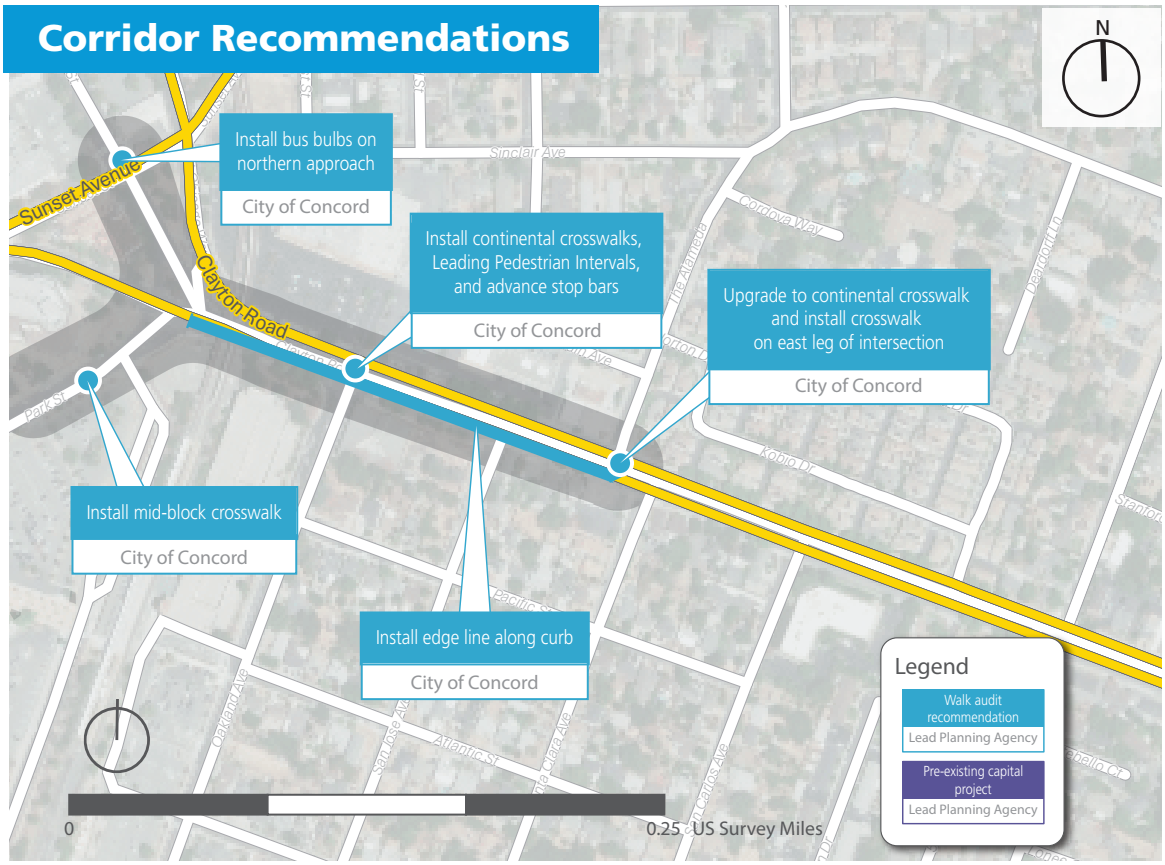
Focus Station Area Action Plan

3 Clayton Road from Park St to The Alameda; Sunset St and East St

Corridor Context

- Clayton Road has 4 travel lanes and is divided by a median east of Park Street and the BART station. It intersects three different streets at the BART station including Park Street, East Street, and Port Chicago Highway, prioritizing high volumes of cars and providing limited pedestrian crossings.
- Multiple survey respondents reported safety concerns on Clayton Road, citing speeding and lack of bicycle facilities.
- There were 22 collisions reported on this corridor from 2019 to 2023, with one resulting in a severe injury. The top cause for collisions were traffic signal violations, followed by unsafe speeds.

Corridor Recommendations



Safety Benefits

FHWA Tier 1 Safety Countermeasure to Remove Severe Conflicts:

- Bus bulbs reduce pedestrian crossing distance and minimize conflicts caused by buses pulling into and out of the travel lane.

FHWA Tier 2 Safety Countermeasure to Reduce Vehicle Speeds:

- Edge lines reduce the width of the travel lane, encouraging slower speeds.

FHWA Tier 3 Safety Countermeasure to Manage Conflicts in Time:

- Leading Pedestrian Intervals (LPIs) allow pedestrians to begin crossing before vehicles are given the green signal.

FHWA Tier 4 Safety Countermeasure to Increase Attentiveness and Awareness:

- High-visibility crosswalks increase the visibility of pedestrians at marked crosswalks.
- Advance stop bars improve visibility of crossing pedestrians by increasing the distance between stopped motorists and crossing pedestrians.

Estimated Capital Cost

$100,000

In US Dollars 2025

Concord

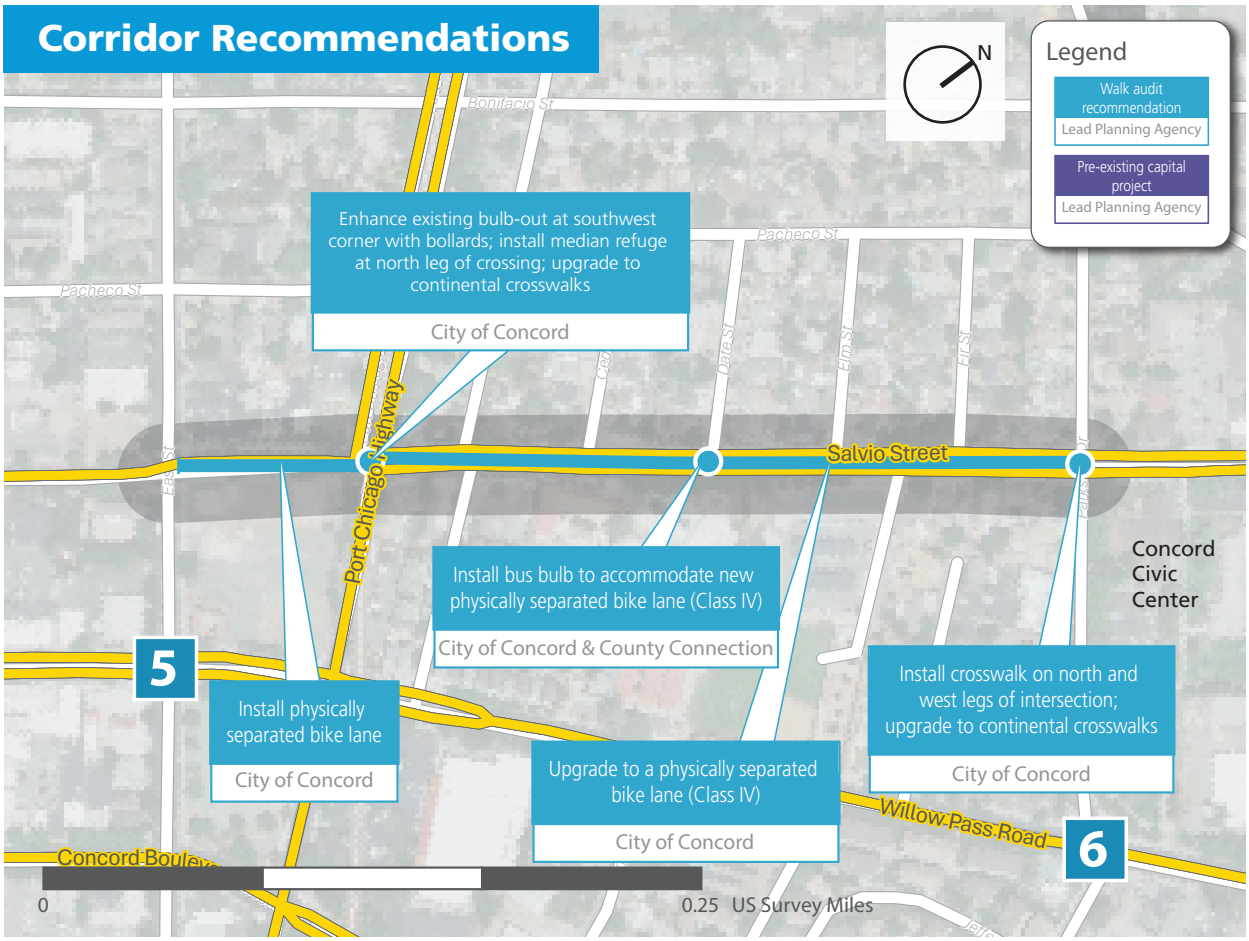
Focus Station Area Action Plan

4 Salvio Street from East Street to Parkside Drive

Corridor Context

- Salvio Street is an east-west collector that serves as a multimodal corridor connecting Concord's Civic Center, Todos Santos Plaza and nearby residential neighborhoods. There is currently a buffered bike lane in this section.
- Reducing vehicles on this corridor is important because it is adjacent to Crossroads High School and residential communities.
- There were 14 recorded collisions on this corridor, and most of them were related to traffic signal violations.

Corridor Recommendations



Safety Benefits

FHWA Tier 1 Safety Countermeasure to Remove Severe Conflicts:

- Physically separated bicycle lanes will provide physical barrier between bicyclist and vehicles to reduce chance for severe conflicts.
- A pedestrian refuge reduces exposure and allows pedestrians to focus on crossing one direction of traffic at a time.
- Bulb-outs reduce the distance pedestrians need to cross, decreasing the time they are exposed to traffic.

FHWA Tier 4 Safety Countermeasure to Increase Attentiveness and Awareness:

- High-visibility crosswalks make crossing pedestrians more visible to drivers.
- Bulb-outs improve sight lines between pedestrians and drivers.

Estimated Capital Cost

$200,000

In US Dollars 2025

Concord

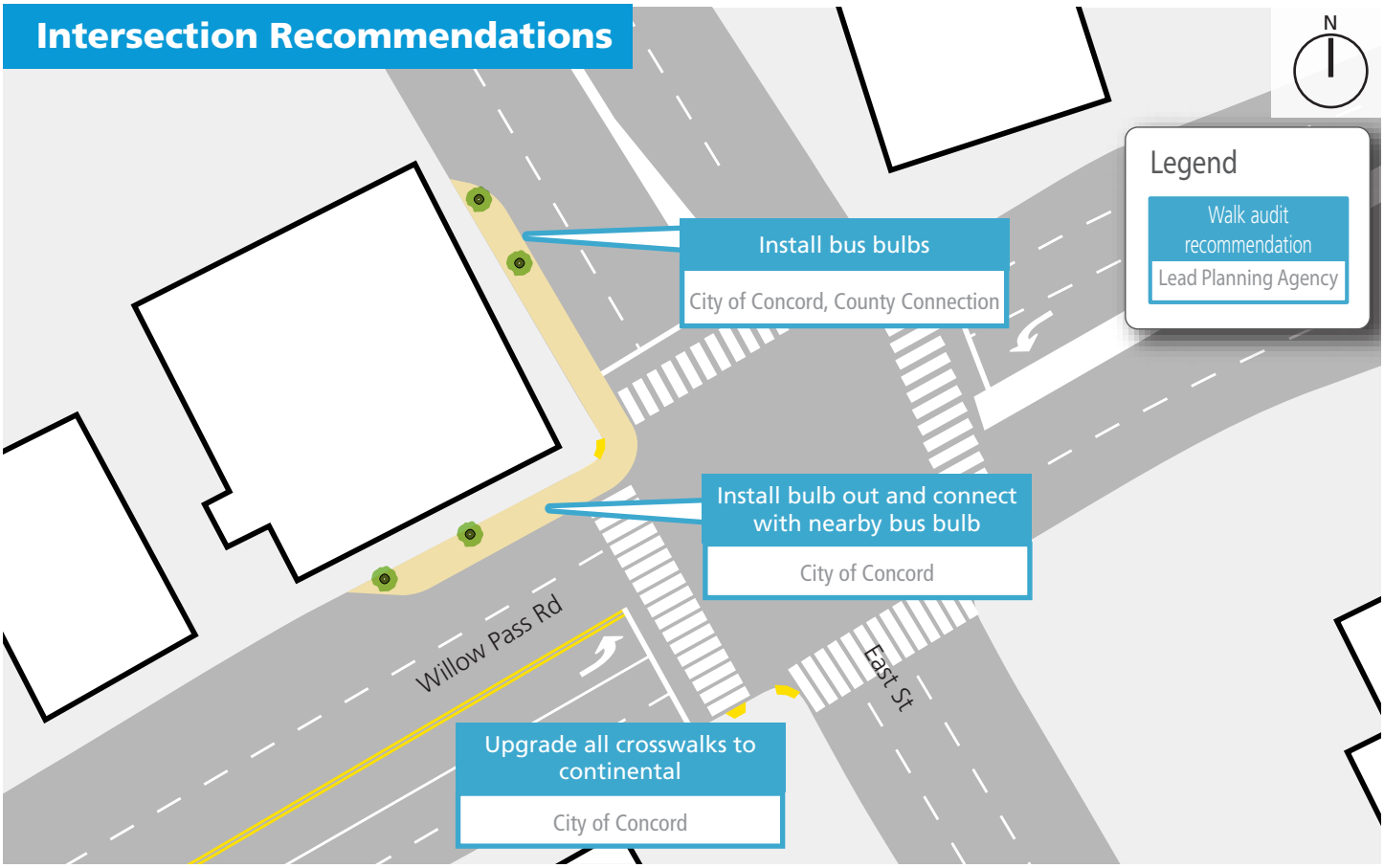
Focus Station Area Action Plan

5 Willow Pass Road & East Street

Intersection Context

- Willow Pass Road is considered a high volume street with 30-35 mph speed limits in the downtown district, where there is high pedestrian activity.
- The intersection of Willow Pass Road and East Street is adjacent to the future Concord Village Project, which will be a five story building with 230 residential units. Improving safety at this location will be important with an increase in pedestrian activity.
- There were 11 collisions recorded at this intersection, with traffic signal violation as the most common cause.

Intersection Recommendations



Safety Benefits

FHWA Tier 1 Safety Countermeasure to Remove Severe Conflicts:

- Bus bulbs reduce pedestrian crossing distance and exposure to conflicts with vehicles.

FHWA Tier 2 Safety Countermeasure to Reduce Vehicle Speeds:

- Bus bulbs reduce the width of the roadway and encourage drivers to reduce speed.

FHWA Tier 4 Safety Countermeasure to Increase Attentiveness and Awareness:

- High-visibility continental crosswalks make crossing pedestrians more visible to drivers.

Estimated Capital Cost

$100,000

In US Dollars 2025

Concord

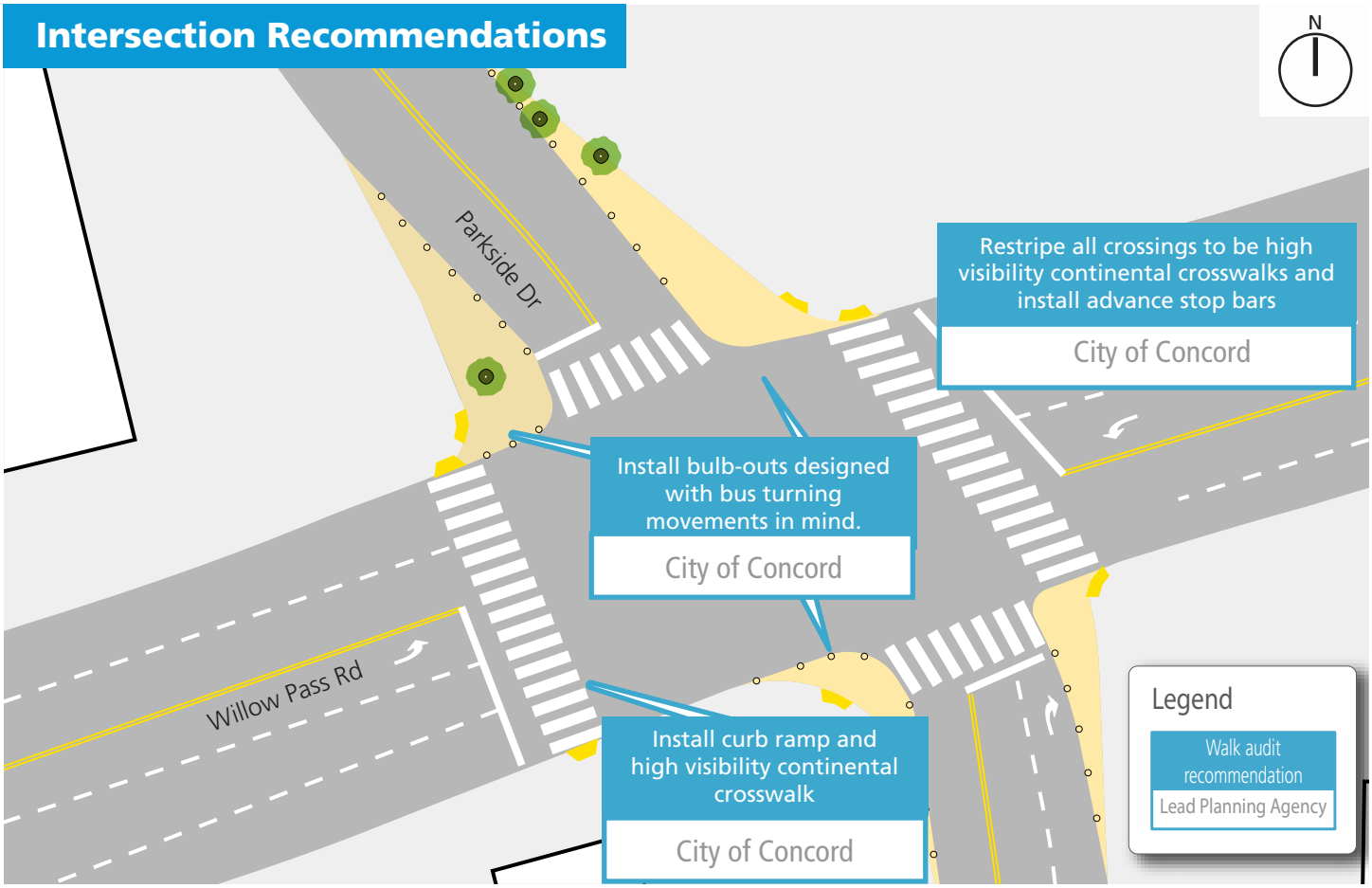
Focus Station Area Action Plan

6 Willow Pass Road & Parkside Drive

Intersection Context

- Willow Pass Road is a primary gateway to Concord Civic Center, which includes City Hall and the library. Willow Pass Road and Parkside Drive is an intersection of a 4-lane arterial and a 2-lane local street.
- There were five collisions recorded at this intersection, one of which was a fatal collision involving a pedestrian. The primary collision factors were unsafe speeds, pedestrian violations, and improper turning.

Intersection Recommendations



Safety Benefits

FHWA Tier 2 Safety Countermeasure to Reduce Vehicle Speeds:

- Bulb-outs reduce the turn radii and vehicle turning speed by forcing vehicles to make sharper turns.

FHWA Tier 4 Safety Countermeasure to Increase Attentiveness and Awareness:

- High-visibility crosswalks make crossing pedestrians more visible to drivers.
- Advance stop bars improve visibility of crossing pedestians and increase distance between crossing pedestrians and stopped motorists.

Estimated Capital Cost

$20,000 (Quick Build) - $200,000

In US Dollars 2025

Hayward

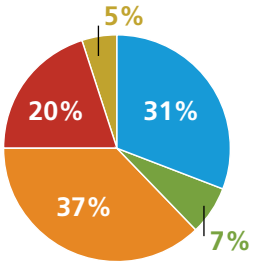
Focus Station Area Action Plan

Station at a Glance

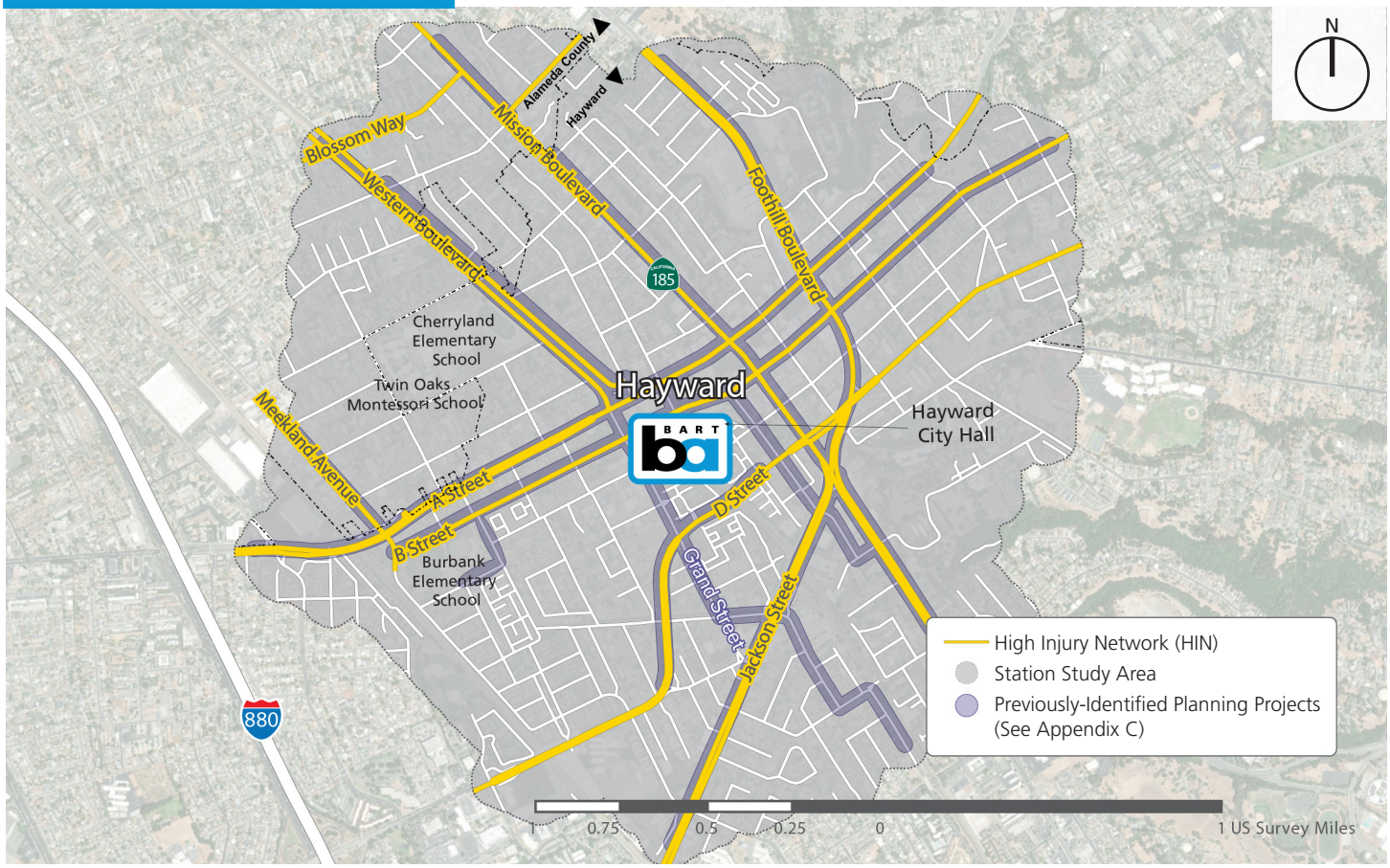
Station Access Type: Balanced Intermodal

Access Mode Share

- Walk
- Transit
- Bicycle
- Drive Alone / Carpool
- Drop Off / Taxi / Other



Station Area Map



Jurisdiction(s) with roads on HIN: City of Hayward, County of Alameda

Safety by the Numbers

5-year Collision Data: 2019-2023

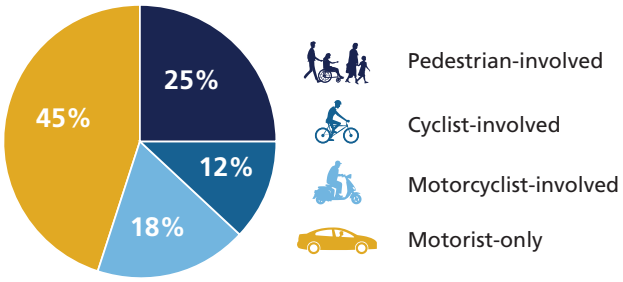
23% Percent of Station study area street miles on the HIN

49 Number of people killed or severely injured (KSI)

10% Percent of crashes that resulted in KSI

Killed/Severe Injury (KSI) Crashes

Total KSI: 49



Hayward

Focus Station Area Action Plan

Key Corridors and Intersections

Jurisdiction(s) with roads on HIN: City of Hayward, County of Alameda

1 Western Boulevard from Blossom Way to A Street

2 A St from Western Blvd to Mission Blvd; B St and Grand St

3 C Street & Foothill Boulevard

4 D Street & Foothill Street

5 D Street & Grand Street

Hayward

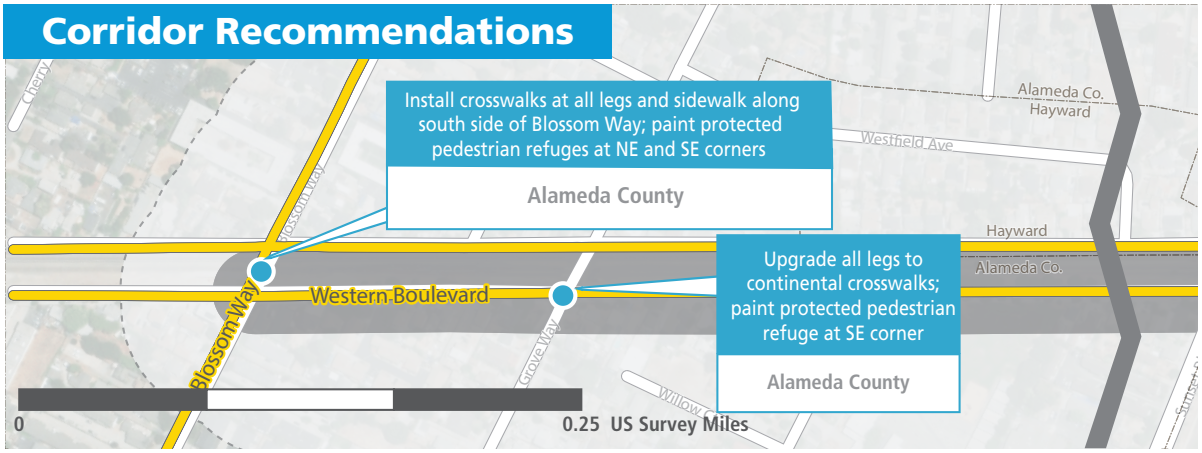
Focus Station Area Action Plan

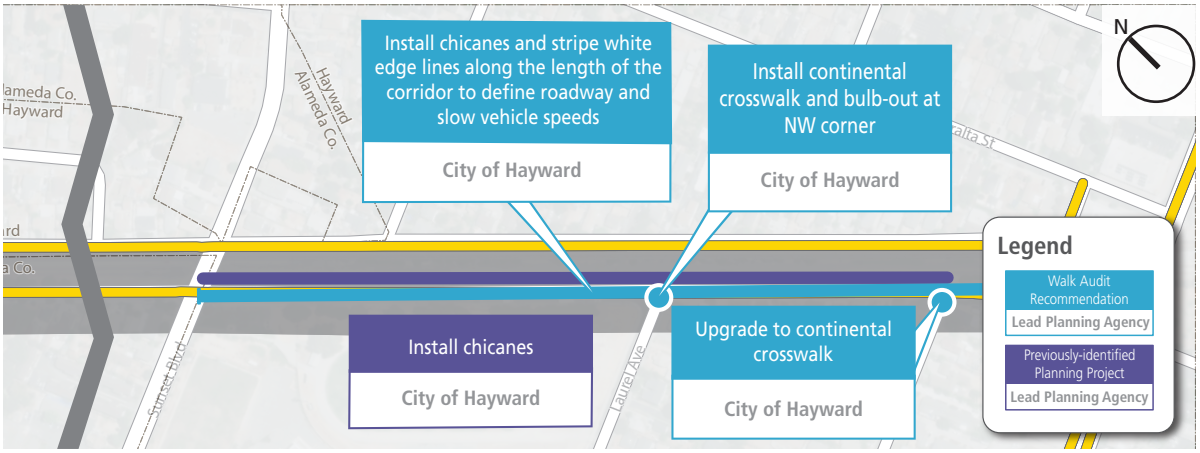
1 Western Boulevard from Blossom Way to A Street

Corridor Context

- Western Boulevard extends northwest along the BART corridor beyond Hayward's city limits. The study segment is located to the west of the BART corridor and contains one vehicle lane in each direction with sharrows and a parking lane on the west side of the street.
- This corridor has seen 19 collisions between 2019-2023; around 25% of these involved a bicyclist or pedestrian. All pedestrian collisions occured at a legal crossing.
- During the walk audit, high vehicle speeds were observed along the corridor.

Corridor Recommendations





Safety Benefits

FHWA Tier 2 Safety Countermeasures to Reduce Vehicle Speeds:

- Traffic calming measures will encourage slower speeds throughout the entire corridor.
- Reductions in turning radii will reduce vehicle speeds around turns where pedestrians may be present.

FHWA Tier 4 Safety Countermeasures to Increase Attentiveness and Awareness:

- High-visibility crosswalks and other crossing enhancements make crossing pedestrians more visible to drivers.

Estimated Capital Cost

$300,000

In US Dollars 2025

Hayward

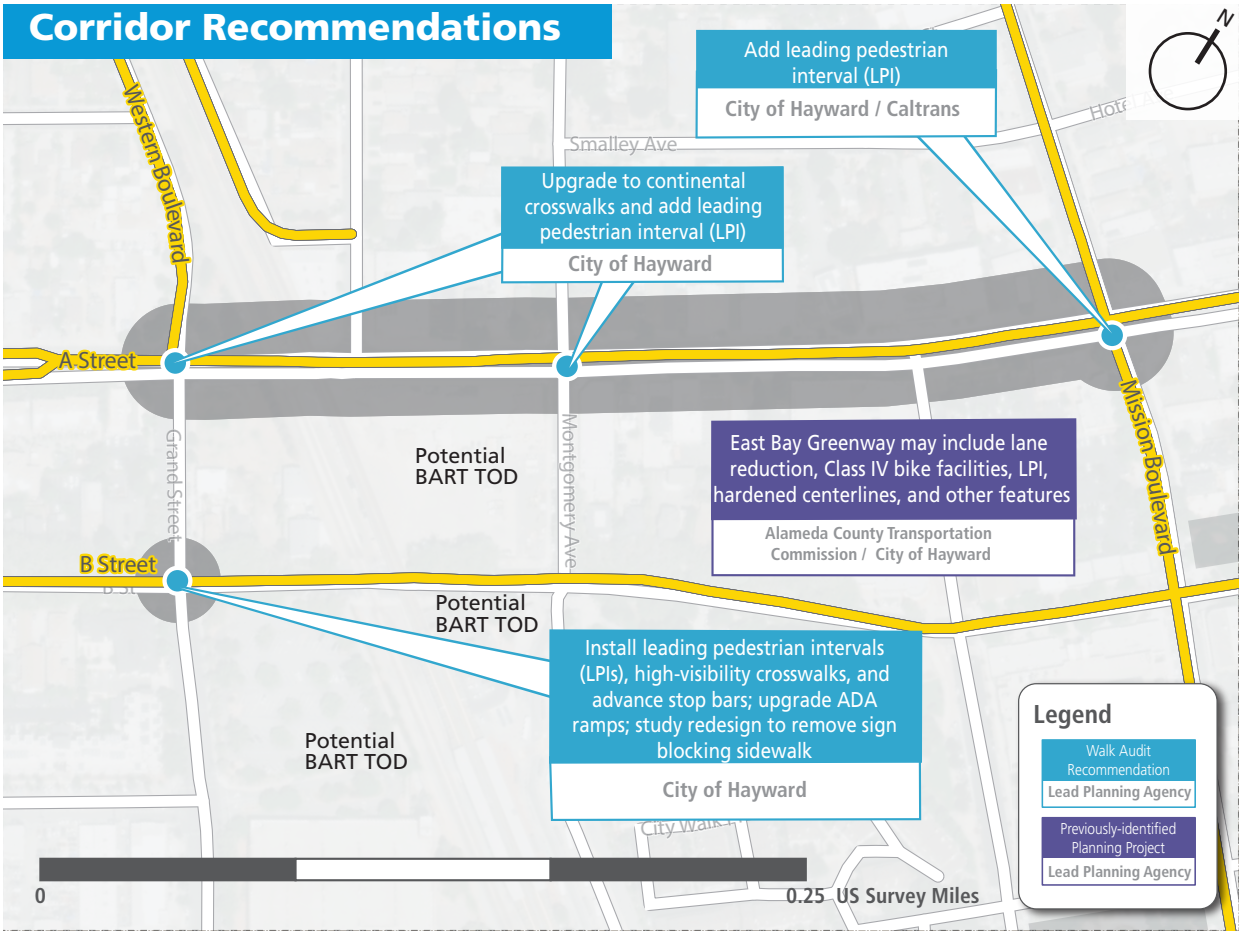
Focus Station Area Action Plan

2 A St from Western Blvd to Mission Blvd; B St and Grand St

Corridor Context

- A Street is an east-west connector on the Safe Trips to BART HIN with significant retail activity. There is one development site nearly completed and another future development along this stretch.
- This corridor segment recorded 18 collisions between 2019-2023, and 8 of these involved a pedestrian.
- High-incident locations include A Street at Western Boulevard, A Street at Mission Boulevard, and near A Street and Montgomery Street.
- The East Bay Greenway proposed conceptual alignment follows Montgomery, B, and Grand Streets.

Corridor Recommendations



Safety Benefits

FHWA Tier 2 Safety Countermeasures to Reduce Vehicle Speeds:

- Coordinated signal timing encourages slower speeds along a corridor.

FHWA Tier 3 Safety Countermeasures to Manage Conflicts in Time:

- Leading Pedestrian Intervals (LPIs) improve pedestrian visibility and extend the length of the pedestrian phase allowing for safer, more comfortable crossings.

FHWA Tier 4 Safety Countermeasures to Increase Attentiveness and Awareness

- High-visibility crosswalks make crossing pedestrians more visible to drivers.

Estimated Capital Cost

$100,000

In US Dollars 2025

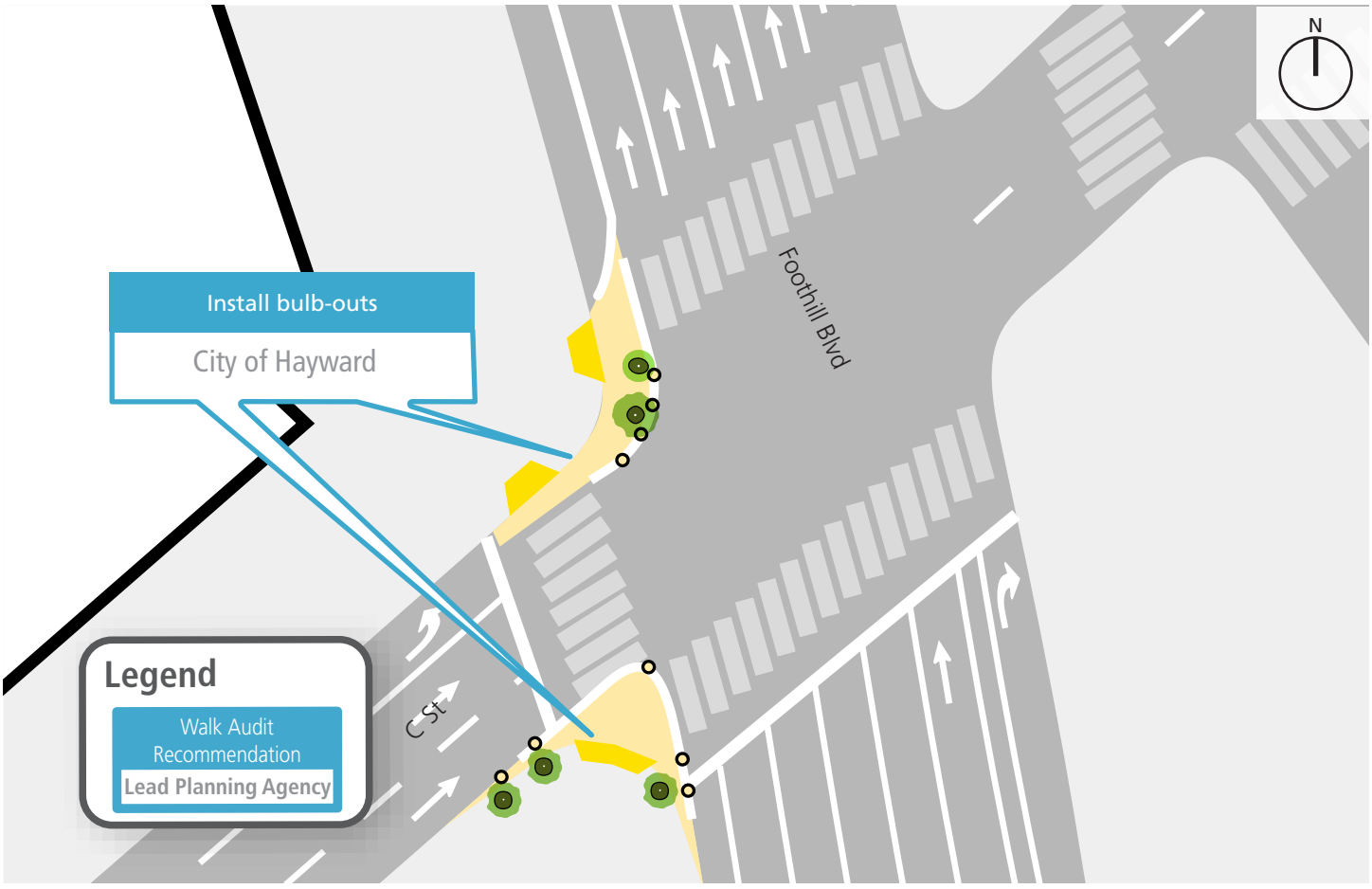
Hayward

Focus Station Area Action Plan

3 C Street & Foothill Boulevard

Corridor Context

- This intersection was selected on the walk audit due to high vehicle volumes and high speeds. Five collisions occurred here between 2019 and 2023.
- The intersection is located along a high-speed, one-way arterial that loops around downtown Hayward. While the City is studying ways to redesign Foothill Boulevard, there are interim measures that can improve safety during the planning and design stage.



Safety Benefits

FHWA Tier 2 Safety Countermeasures to Reduce Vehicle Speeds:

- Installing a quick-build treatment with paint and bollards at the intersection will reduce vehicle speeds around the turn in the short term.
- Bulb-outs reduce the width of the roadway, reduce pedestrian crossing distance, and encourage drivers to reduce speed.

FHWA Tier 4 Safety Countermeasures to Increase Attentiveness and Awareness:

- This intervention also allows pedestrians to be more visible as they can enter the crosswalk while maintaining a level of protection from vehicles.

Estimated Capital Cost

$10,000 - $100,000

In US Dollars 2025

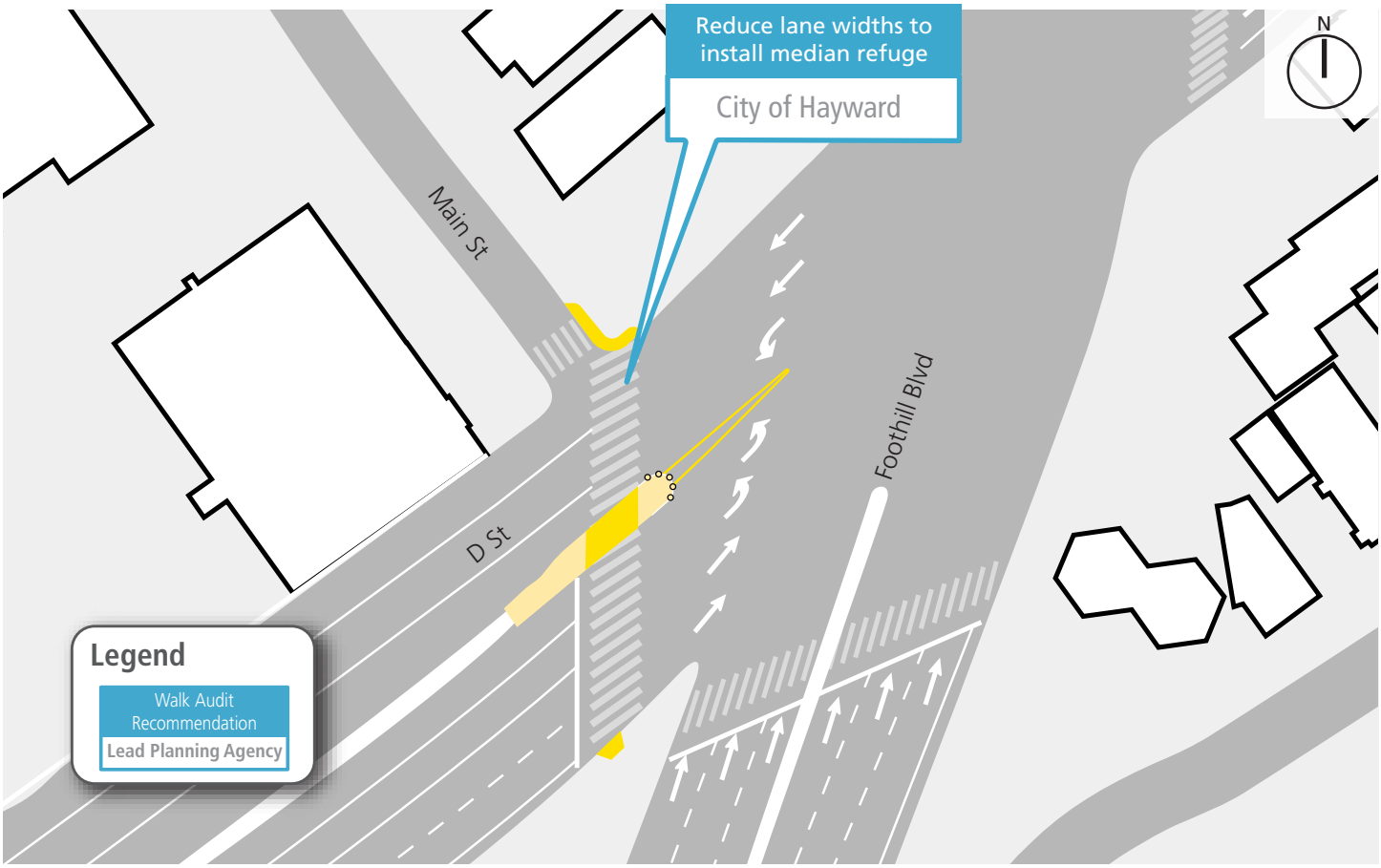
Hayward

Focus Station Area Action Plan

4 D Street & Foothill Boulevard

Corridor Context

- The intersection contains a crossing distance of over 120 feet with no pedestrian refuge. The pedestrian phase may not be long enough to comfortably serve those with mobility challenges who may move slower than the average design pace.
- While only one collision ocurred at this location between 2019-2023, 12 collisions were recorded on D Street at Foothill Boulevard, just 200 feet east of this location. This intersection will be addressed as part of the City's redesign of Foothill Boulevard.



Safety Benefits

FHWA Tier 1 Safety Countermeasures to Remove Severe Conflicts:

- A median refuge offers a designated pedestrian space in the middle of a long crossing and provides separation between modes.

FHWA Tier 2 Safety Countermeasures to Reduce Vehicle Speed:

- Lane widths will need to be reduced by 1-1.5' to provide space for a median refuge. This change will encourage slower speeds as vehicles approach the intersection.

Estimated Capital Cost

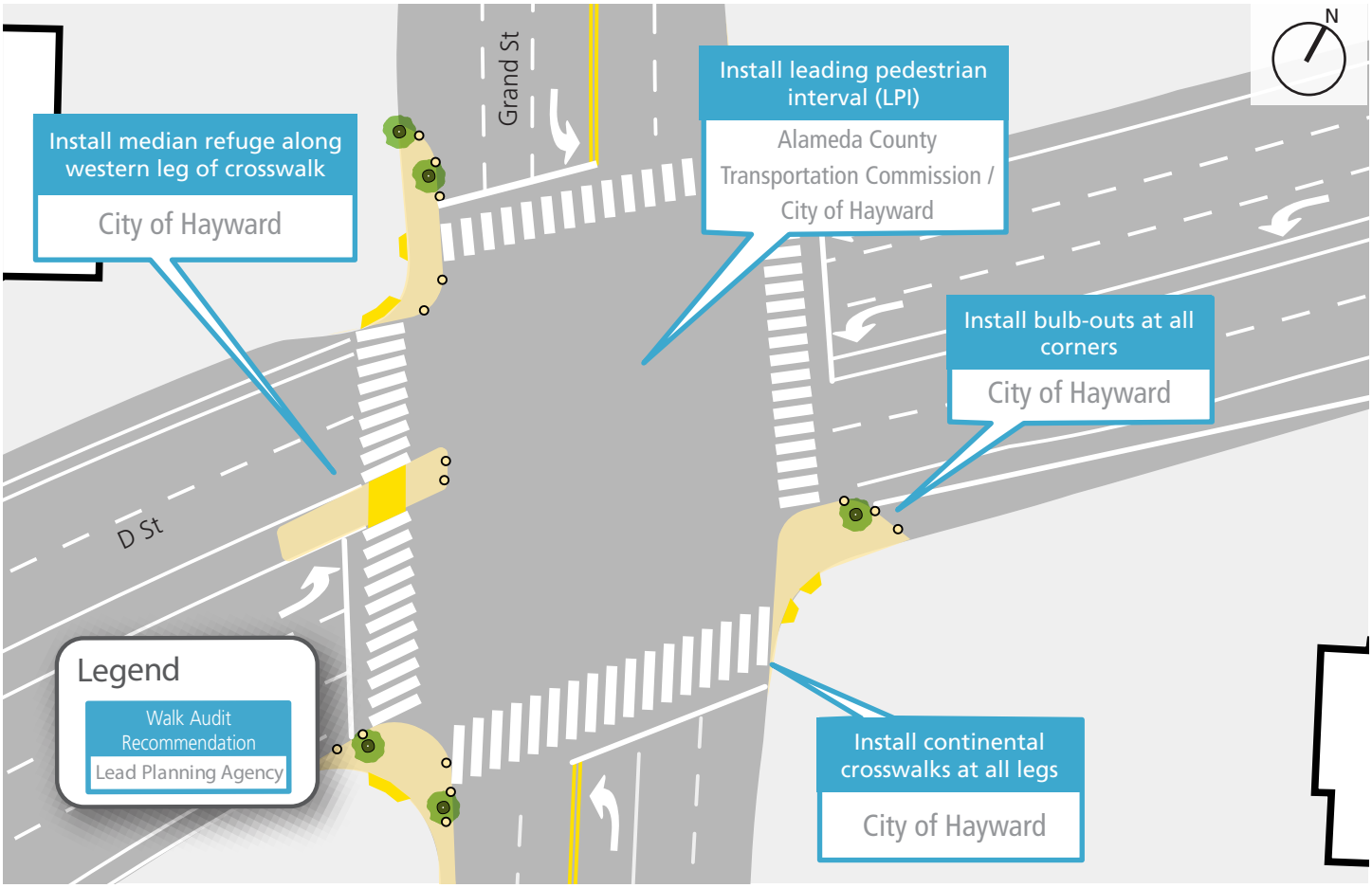
$100,000

In US Dollars 2025

5 D Street & Grand Street

Intersection Context

- D Street meets Grand Street at a 60-degree angle. Ideally, intersections should meet at 90-degrees and at no less than 75-degrees to enable sufficient visibility.
- The East Bay Greenway is planned to continue through Hayward on Grand Street in the future.



Safety Benefits

FHWA Tier 1 Safety Countermeasures to Remove Severe Conflicts:
- Raised medians can also serve as crossing islands, which reduce crossing distance.

FHWA Tier 2 Safety Countermeasures to Reduce Vehicle Speeds:
- Bulb-outs reduce the width of the roadway, reduce pedestrian crossing distance, and encourage drivers to reduce speed.

FHWA Tier 4 Safety Countermeasures to Increase Attentiveness and Awareness:
- The proposed bulb-outs improve the angle of intersection to maximize visibility.
- High-visibility crosswalks increase driver attentiveness to crossing pedestrians.

Estimated Capital Cost

$100,000 (Quick Build) - $200,000

In US Dollars 2025

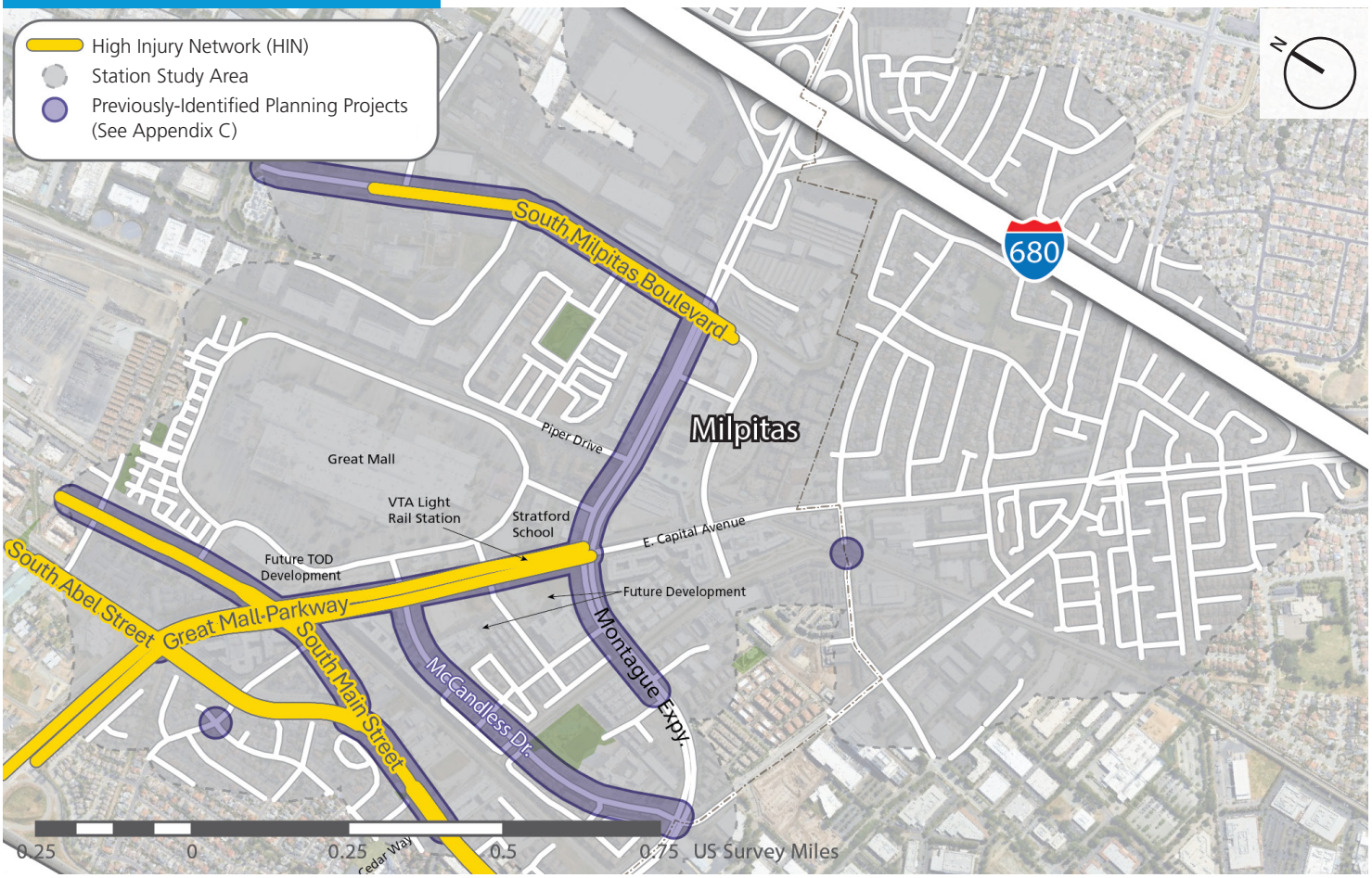
Milpitas

Focus Station Area Action Plan

Station at a Glance

Station Access Type: Balanced Intermodal

Station Area Map



Jurisdiction(s) with roads on HIN: City of Milpitas and Santa Clara County

Safety by the Numbers

5-year Collision Data: 2019-2023

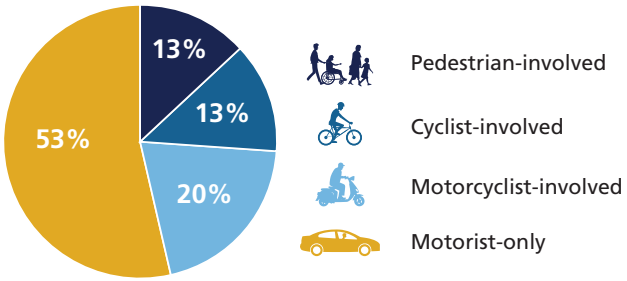
7% Percent of Station study area street miles on the HIN

15 Number of people killed or severely injured (KSI)

6% Percent of crashes that resulted in KSI

Killed/Severe Injury (KSI) Crashes

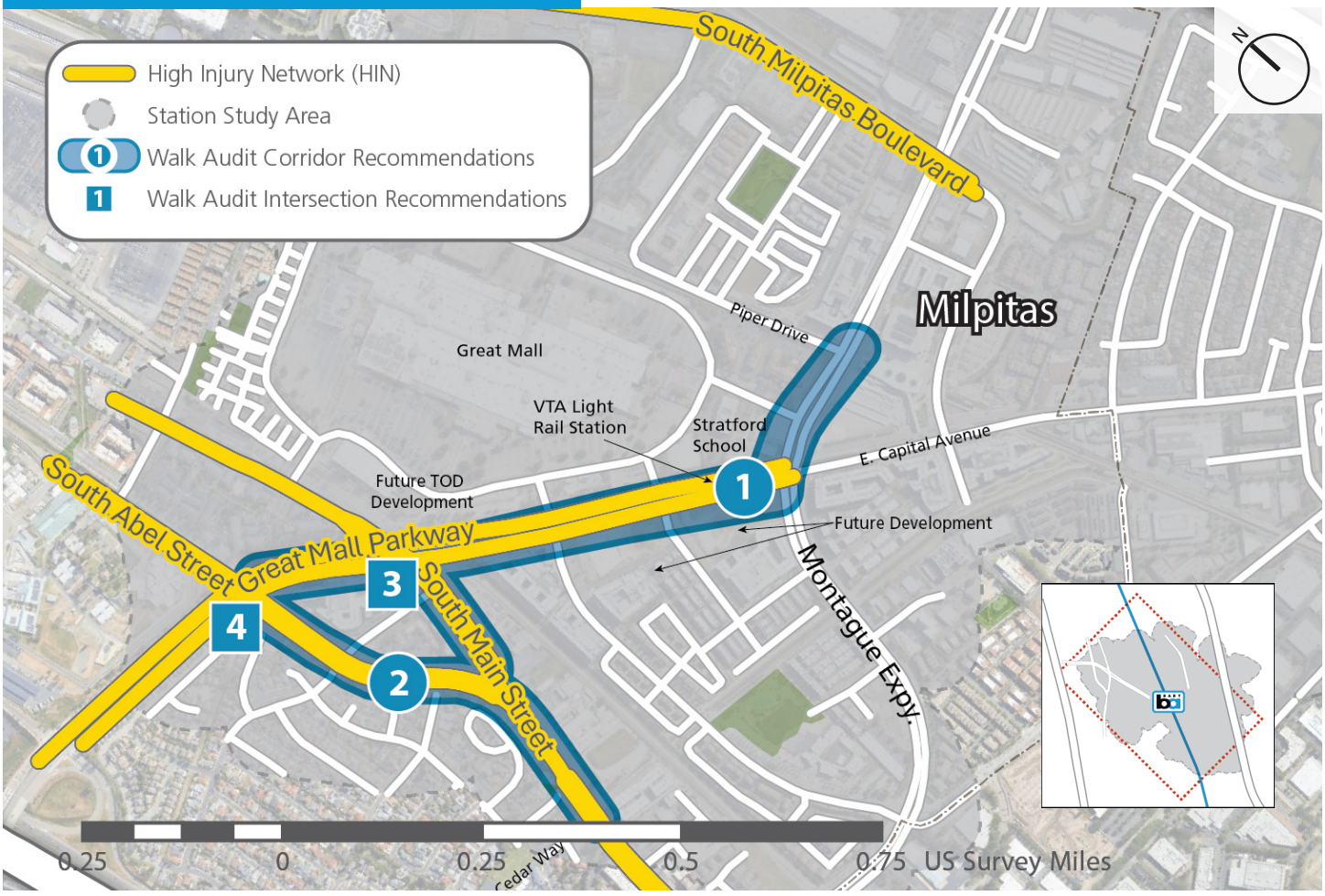
Total KSI: 15



Milpitas

Focus Station Area Action Plan

Key Corridors and Intersections



Jurisdiction(s) with roads on HIN: City of Milpitas and Santa Clara County

1 Montague Expressway & Piper Drive to Great Mall Parkway & Main Street

2 Main Street and Abel Street from Great Mall Parkway to Cedar Way

3 Great Mall Parkway & Main Street

4 Great Mall Parkway & Abel Street

Milpitas

Focus Station Area Action Plan

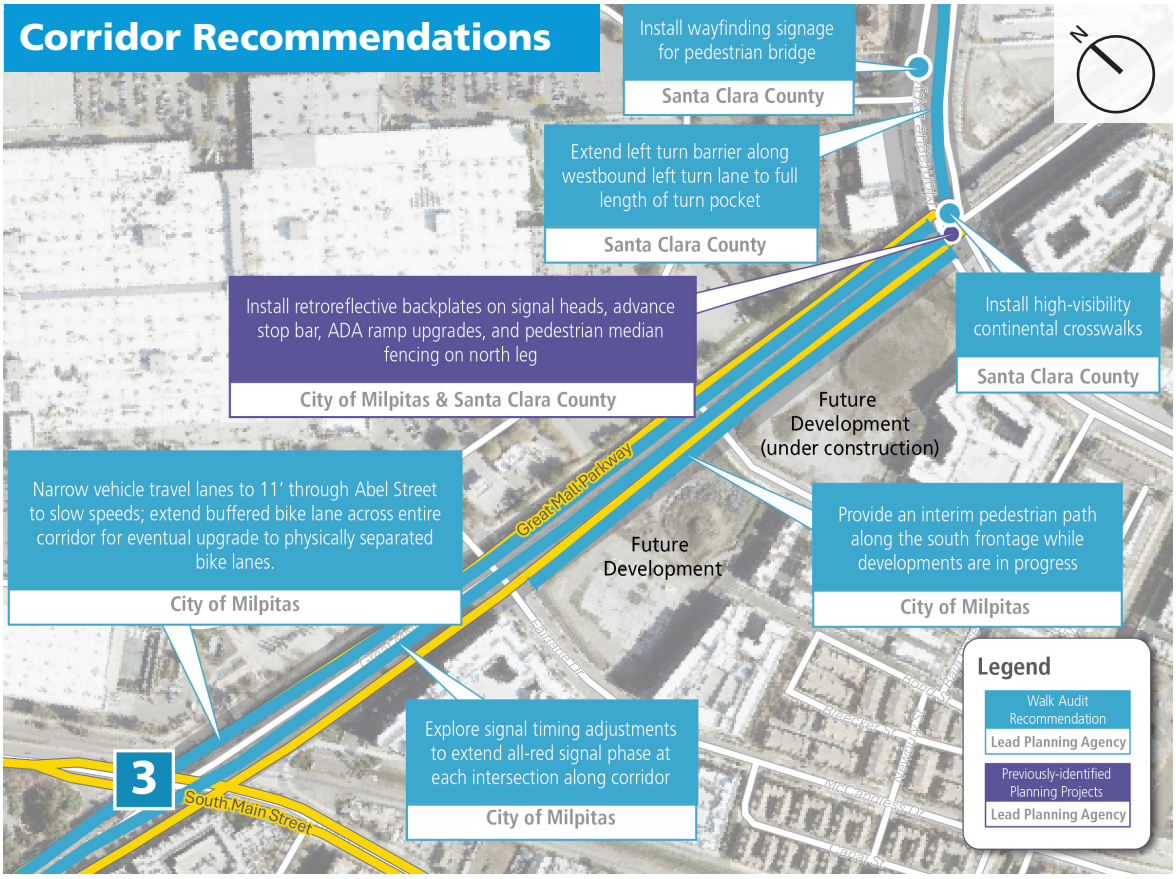
1 Montague Expressway & Piper Drive to Great Mall Parkway & Main Street

Corridor Context

- This study corridor includes Montague Expressway by the BART Station and Great Mall Parkway from Montague Expressway to South Main Street. This is a high-activity corridor along the Great Mall with VTA bus and light rail service.
- Survey respondents reported that drivers tend to ignore traffic signals due to long cycle lengths.
- There have been 67 collisions on this corridor between 2019 and 2023, with nearly half of them being broadside collisions.

  The most common collision causes are unsafe speeds and traffic sign and signal violations. A major risk factor on this corridor is wide, multi-lane roads with minimal crossing opportunities and long cycle lengths.

Corridor Recommendations



*Interim pedestrian path along south frontage is not included in cost estimate.

Safety Benefits

FHWA Tier 1 Safety Countermeasures to Remove Severe Conflicts:

- Extending the raised left turn barrier along Montague Expressway will prevent drivers exiting Falcon Drive from making dangerous maneuvers across several lanes of traffic to enter the left turn lanes and head southbound on Great Mall Parkway.

FHWA Tier 2 Safety Countermeasures to Reduce Vehicle Speeds:

- Reducing travel lane width and coordinating signal timing reduces vehicle speeds.

FHWA Tier 3 Safety Countermeasures to Manage Conflicts in Time:

- Extending the all-red signal phase decreases the likelihood of a broadside collision by allowing more time for vehicles to clear the intersection.

FHWA Tier 4 Safety Countermeasures to Increase Attentiveness and Awareness:

- High-visibility crosswalks make crossing pedestrians more visible to drivers.

Estimated Capital Cost

$500,000

In US Dollars 2025

Milpitas

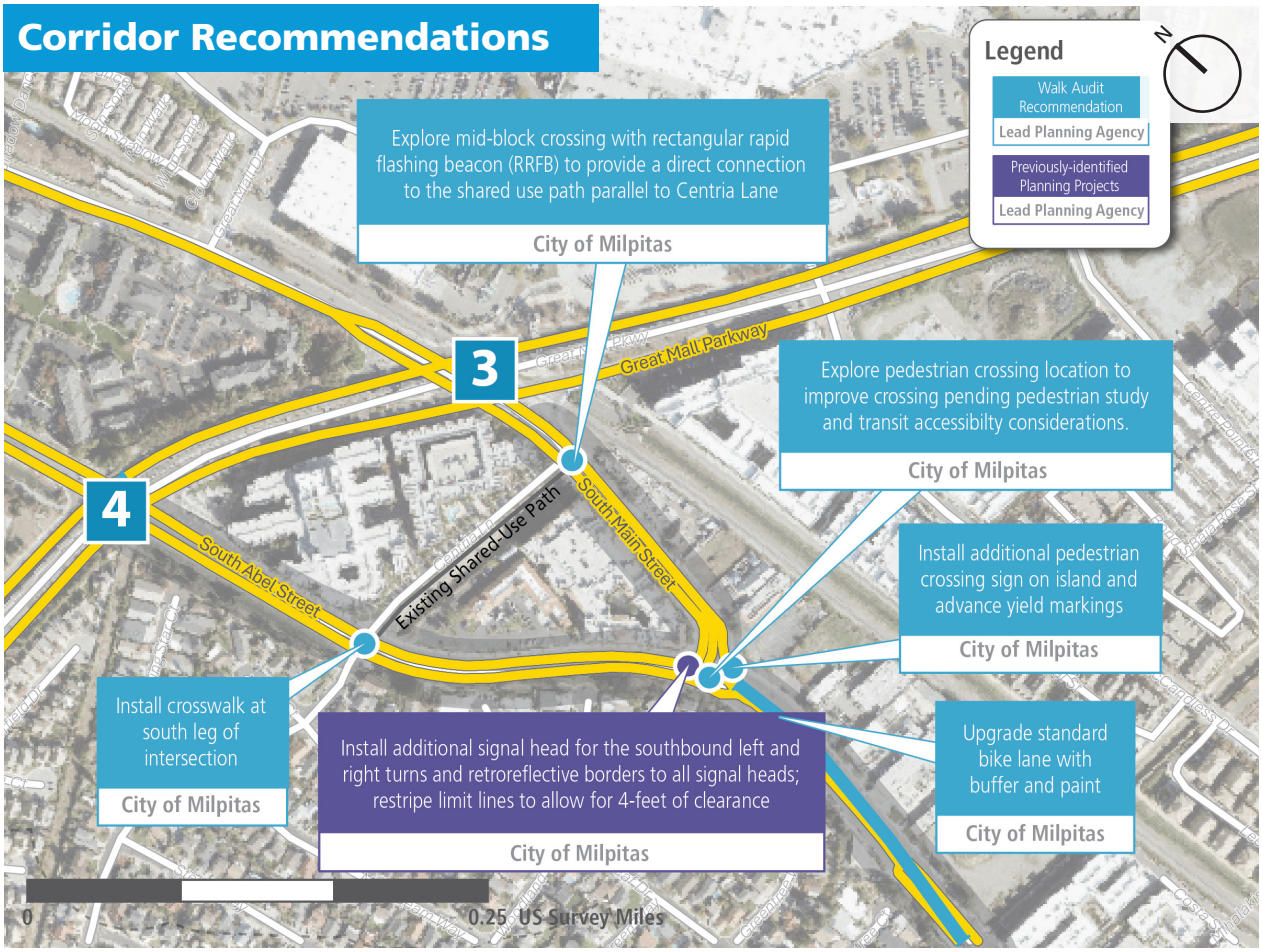
Focus Station Area Action Plan

2 Main Street and Abel Street from Great Mall Parkway to Cedar Way

Corridor Context

- Main Street is a north-south connector between Montague Expressway and Great Mall Parkway in Milpitas. Main Street splits into two parallel roads, Main Street and Abel Street, about a quarter of a mile south of Great Mall Parkway. Main Street provides access to the Great Mall VTA light rail station on Great Mall Parkway.
- The study corridor features long distances between marked or signalized crossings, which may encourage unsafe crossings.
- This corridor segment recorded 15 collisions between 2019-2023. Nearly half of these collisions were the result of unsafe speeds, and the next common violation was improper turning.

Corridor Recommendations



Safety Benefits

FHWA Tier 2 Safety Countermeasures to Reduce Vehicle Speeds:

- Upgrading the existing bike lanes (Class II) to be buffered will provide more physical separation between moving vehicles and bicyclists. It will also require a vehicle lane width reduction, which can help manage vehicle speeds along the corridor.

FHWA Tier 4 Safety Countermeasures to Manage Increase Attentiveness and Awareness:

- Providing additional crossing opportunities at locations with appropriate crossing facilities increases the likelihood that pedestrians will cross where they will be most visible to vehicles.
- Advance stop bars improve visibility to pedestrians by increasing the distance between the yielding motorist and crossing pedestrian.
- Retroreflective backplates enhances visibility of the signal in daytime and nighttime.

Estimated Capital Cost

$100,000

In US Dollars 2025

Milpitas

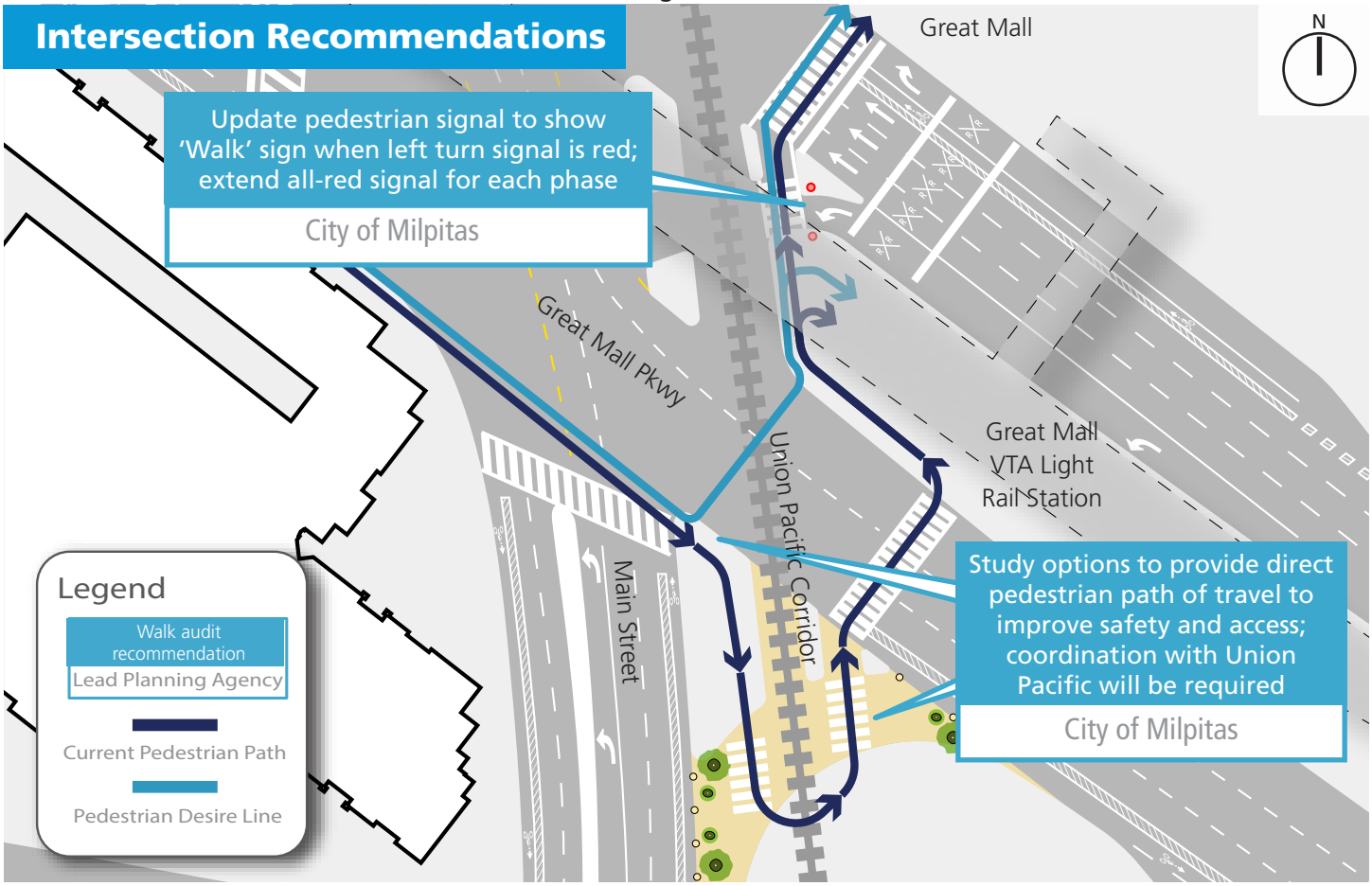
Focus Station Area Action Plan

3 Great Mall Parkway & Main Street

Intersection Context

- Great Mall Parkway is a six-lane arterial that intersects Main Street, a five-lane collector, near the Great Mall and the Great Mall VTA light rail station. The intersection has high volumes of vehicle traffic accessing Great Mall, I-880, and nearby businesses and residences.
- This intersection is complicated by a Union Pacific Rail line that runs parallel to Main Street, creating additional crossings for pedestrians trying to access the Great Mall or the light rail station. Pedestrians on the southwest corner have to cross traffic four times to access the light rail station located above the center median.

Intersection Recommendations



Safety Benefits

FHWA Tier 1 Safety Countermeasures to Remove Severe Conflicts:

- Closing the slip lane requires vehicles to stop at red lights.
- Simplifying the pedestrian crossing options increases the likelihood that pedestrians will cross where they are most visible to drivers and may reduce overall crossing distance.

FHWA Tier 2 Safety Countermeasures to Reduce Vehicle Speeds:

- Closing the slip lane reduces the turn radius and encourages vehicles to make slower turns.

FHWA Tier 3 Safety Countermeasures to Manage Conflicts in Time:

- Allowing pedestrians to cross when the left turn signal is red will increase the likelihood that pedestrians wait to cross at a safe opportunity.
- Increasing the all-red signal phase, as recommended along Great Mall Parkway, can reduce collision likelihood by allowing more time for vehicles to clear the intersection.

Estimated Capital Cost

$10,000

In US Dollars 2025

Milpitas

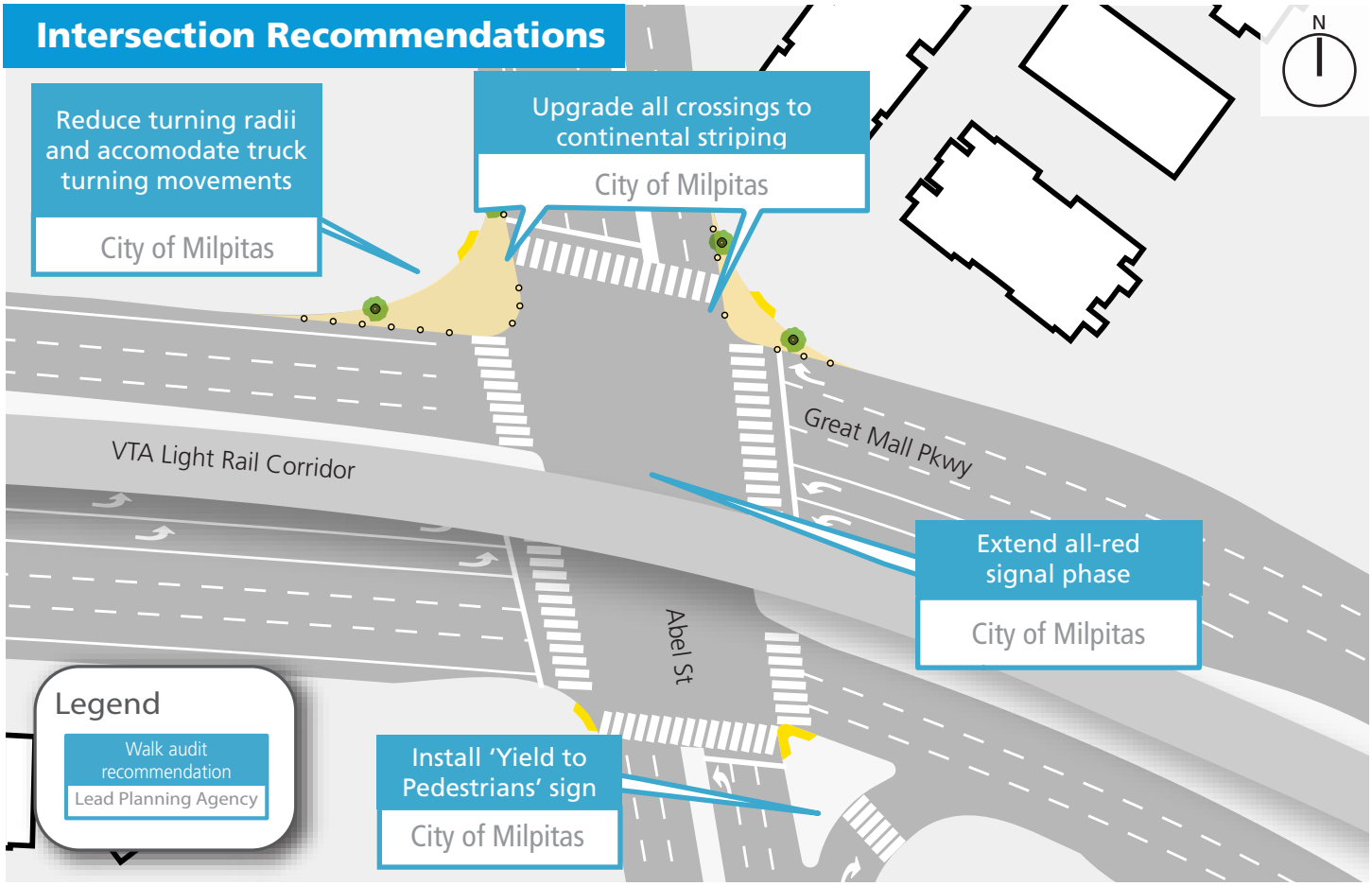
Focus Station Area Action Plan

4 Great Mall Parkway & Abel Street

Corridor Context

- Great Mall Parkway intersects with Abel Street just west of the Great Mall VTA light rail station and the Great Mall.
- Pedestrian crossings are approximately 185 feet long, exposing pedestrians to traffic for long periods of time.
- 13 collisions were recorded at this intersection between 2019-2023. A traffic signal or sign violation contributed to over half of these.

Intersection Recommendations



Safety Benefits

FHWA Tier 1 Safety Countermeasures to Remove Severe Conflicts:

- Bulb-outs reduce the crossing distance and exposure time for crossing pedestrians.

FHWA Tier 2 Safety Countermeasures to Reduce Vehicle Speeds:

- Bulb-outs reduce the turning radius and encourage drivers to reduce speed around turns.

FHWA Tier 3 Safety Countermeasures to Manage Conflicts in Time:

- Increasing the all-red signal phase, as recommended along Great Mall Parkway, can reduce collision likelihood by allowing more time for vehicles to clear the intersection.

FHWA Tier 4 Safety Countermeasures to Increase Attentiveness and Awareness:

- High-visibility continental crosswalks make crossing pedestrians more visible to drivers, and additional signage can alert drivers to pedestrian activity.

Estimated Capital Cost

$200,000

In US Dollars 2025

Richmond

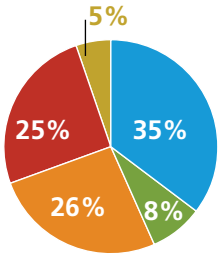
Focus Station Area Action Plan

Station at a Glance

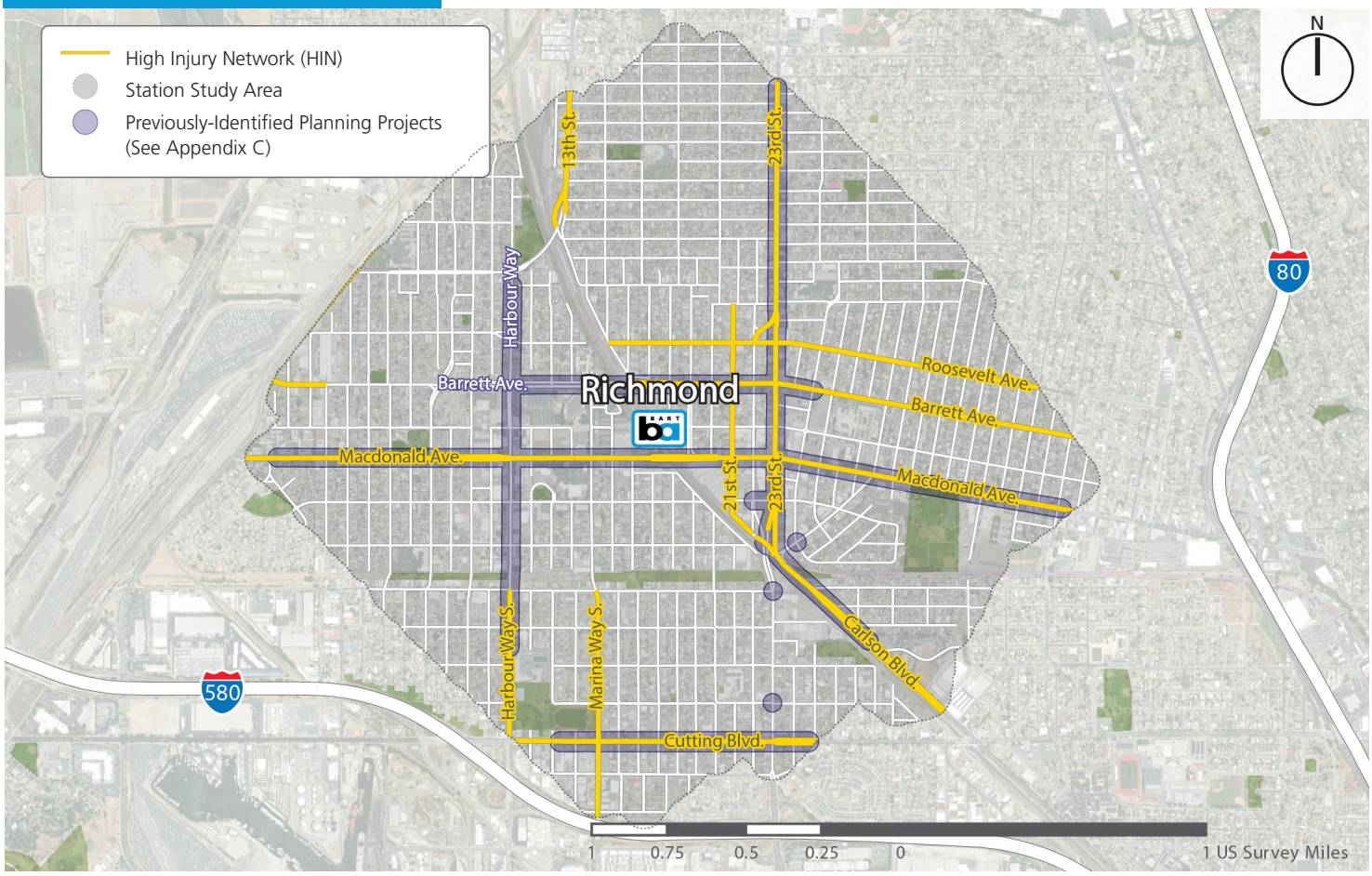
Station Access Type: Balanced Intermodal

Access Mode Share

- Walk
- Transit
- Bicycle
- Drive Alone / Carpool
- Drop Off / Taxi / Other



Station Area Map



Jurisdiction(s) with roads on HIN: City of Richmond and Contra Costa County

Safety by the Numbers

5-year Collision Data: 2019-2023

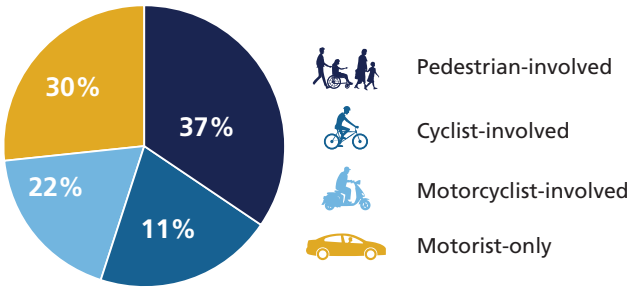
14% Percent of Station study area street miles on the HIN

50 Number of people killed or severely injured (KSI)

9% Percent of crashes that resulted in KSI

Killed/Severe Injury (KSI) Crashes

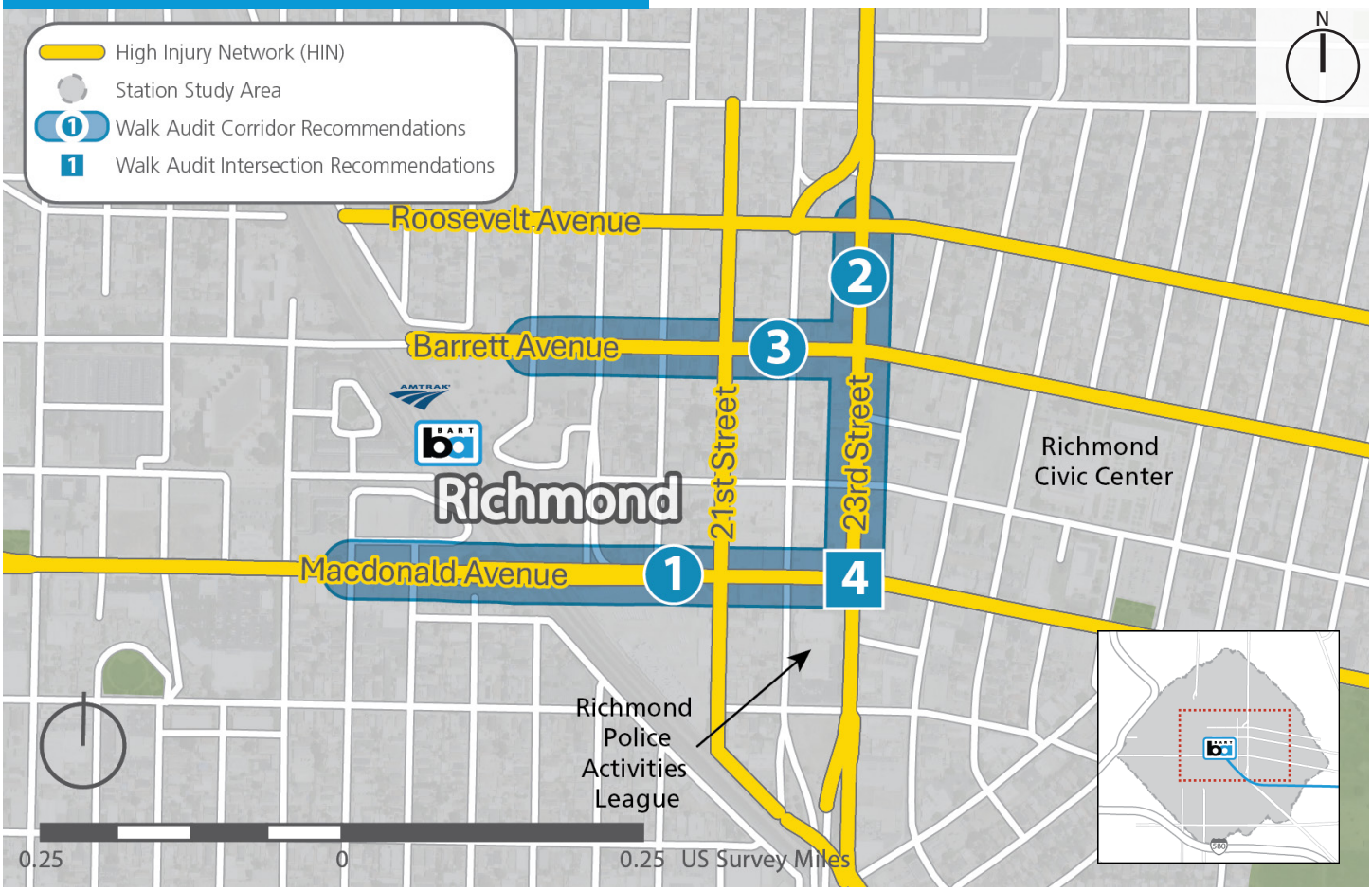
Total KSI: 50



Richmond

Focus Station Area Action Plan

Key Corridors and Intersections



Jurisdiction(s) with roads on HIN: City of Richmond and Contra Costa County

1 **Macdonald Avenue from 15th Street to 23rd Street**

2 **23rd Street from Macdonald Avenue to Roosevelt Avenue**

3 **Barrett Avenue from 23rd Street to 18th Street**

4 **Macdonald Avenue & 23rd Street**

Richmond

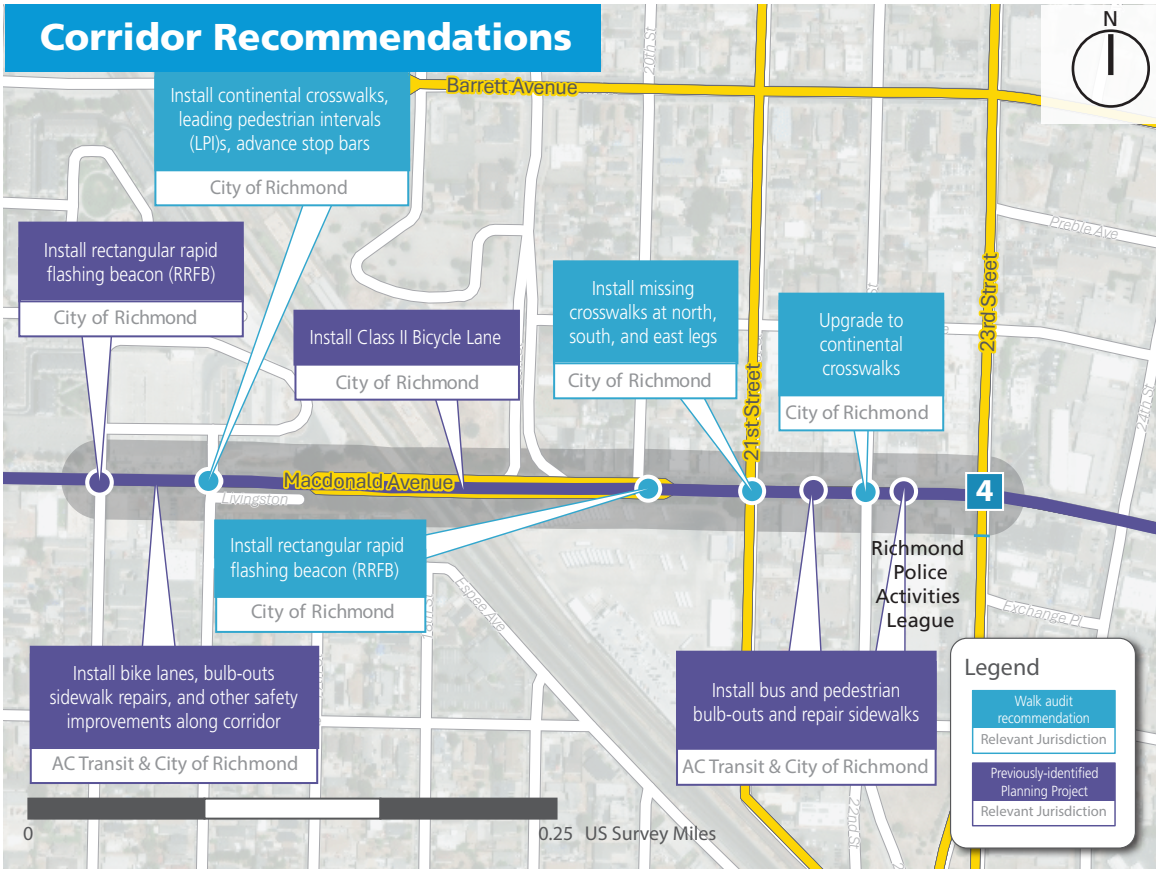
Focus Station Area Action Plan

1 Macdonald Avenue from 15th Street to 23rd Street

Corridor Context

- This corridor provides direct access to the BART and Amtrak stations and AC Transit Lines 71, 72M, and 74.
- The Richmond Community Based Transportation plan identified bicycle and pedestrian accessibility barriers on this street and identified the Macdonald Avenue undercrossing as an unsafe rail crossing/rail barrier.
- There were 43 collisions recorded on this corridor from with one resulting in a fatality between 2019-2023. Bus drivers who rest in between shifts at the relief point on Macdonald and 21st Street have also reported unsafe crossings at this intersection due to lack of crosswalks and high speed vehicles.

Corridor Recommendations



Safety Benefits

FHWA Tier 2 Safety Countermeasures to Reduce Vehicle Speeds:

- Bulbouts reduce the width of the roadway and encourage drivers to reduce speed.

FHWA Tier 3 Safety Countermeasures to Manage Conflicts in Time:

- Upgraded signals with leading pedestrian intervals provide pedestrians a head start before motorists are allowed to proceed through the intersection.
- Coordinated signals encourage slower speeds by timing signals to allow vehicles moving a a certain speed to pass through a corridor without stopping.

FHWA Tier 4 Safety Countermeasures to Increase Attentiveness and Awareness:

- Advance stop bars increase distance between pedestrians and stopped vehicles.
- High-visibility crosswalks and rectangular rapid flashing beacons (RRFBs) make crossing pedestrians more visible to drivers and increase driver yielding compliance.

Estimated Capital Cost

$100,000

In US Dollars 2025

Richmond

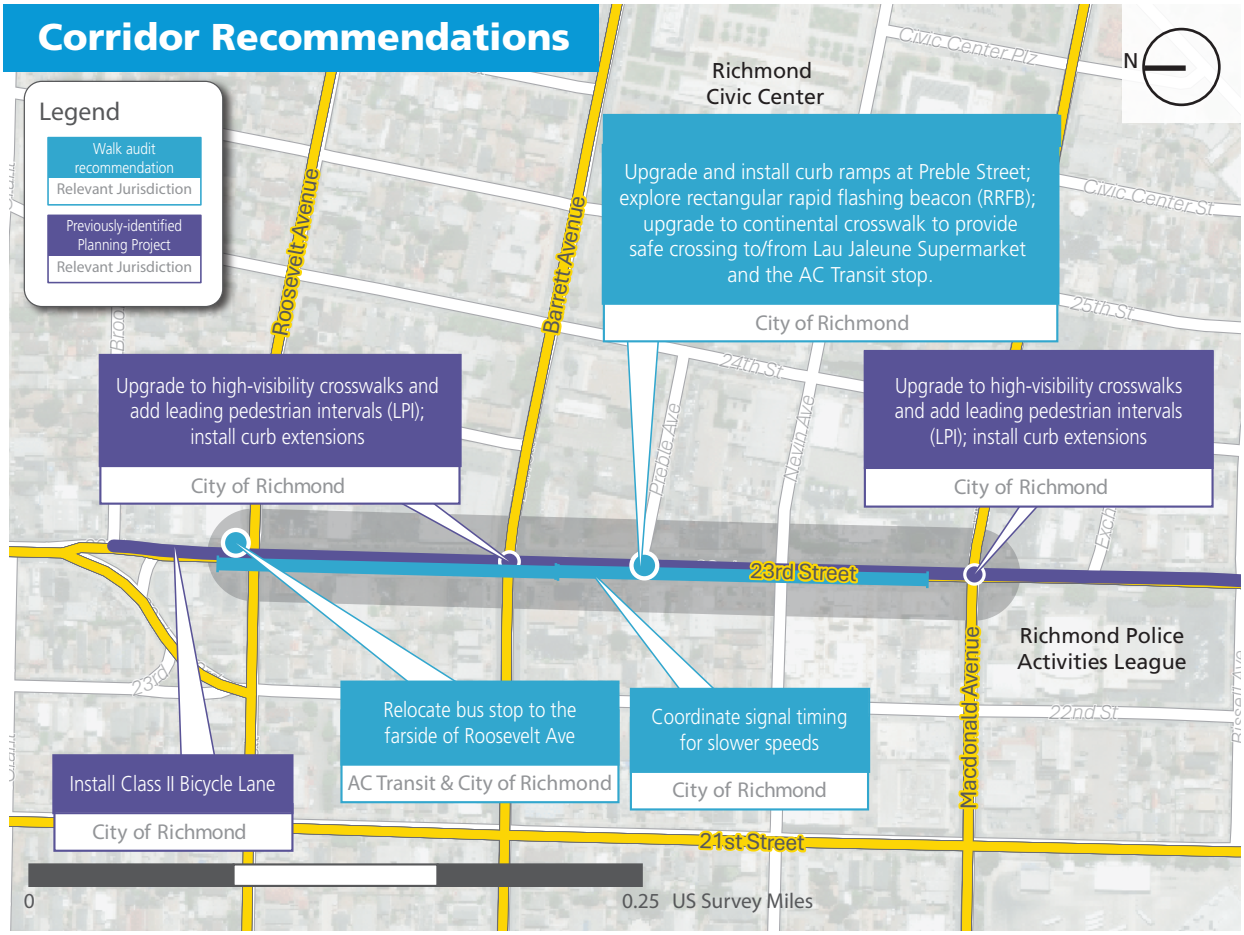
Focus Station Area Action Plan

2 23rd Street from Macdonald Avenue to Roosevelt Avenue

Corridor Context

- 23rd Street is a one-way northbound arterial through Richmond, east of the Richmond BART Station. AC Transit Line 74 runs along 22nd and 23rd street providing access to Richmond BART.
- Survey respondents reported reckless driving on 23rd Street and a lack of marked crosswalks for people to walk across the street safely.
- This corridor segment recorded 28 collisions from 2019-2023; traffic signal and sign violations contributed to some of these. Nearly half of collisions were broadside vehicle-to-vehicle crashes.

Corridor Recommendations



Safety Benefits

FHWA Tier 2 Safety Countermeasures to Reduce Vehicle Speeds:

- Bulbouts reduce the width of the roadway and encourage drivers to reduce speed while turning.

FHWA Tier 3 Safety Countermeasures to Manage Conflicts in Time:

- Upgraded signals with leading pedestrian intervals provide pedestrians a head start before motorist are allowed to proceed through the intersection.
- Coordinated signals encourage slower speeds by timing signals to allow vehicles moving a a certain speed to pass through a corridor without stopping.

FHWA Tier 4 Safety Countermeasures to Increase Attentiveness and Awareness:

- High-visibility crosswalks and rectangular rapid flashing beacons (RRFBs) make crossing pedestrians more visible to drivers and increase driver yielding compliance.

Estimated Capital Cost

$40,000

In US Dollars 2025

Richmond

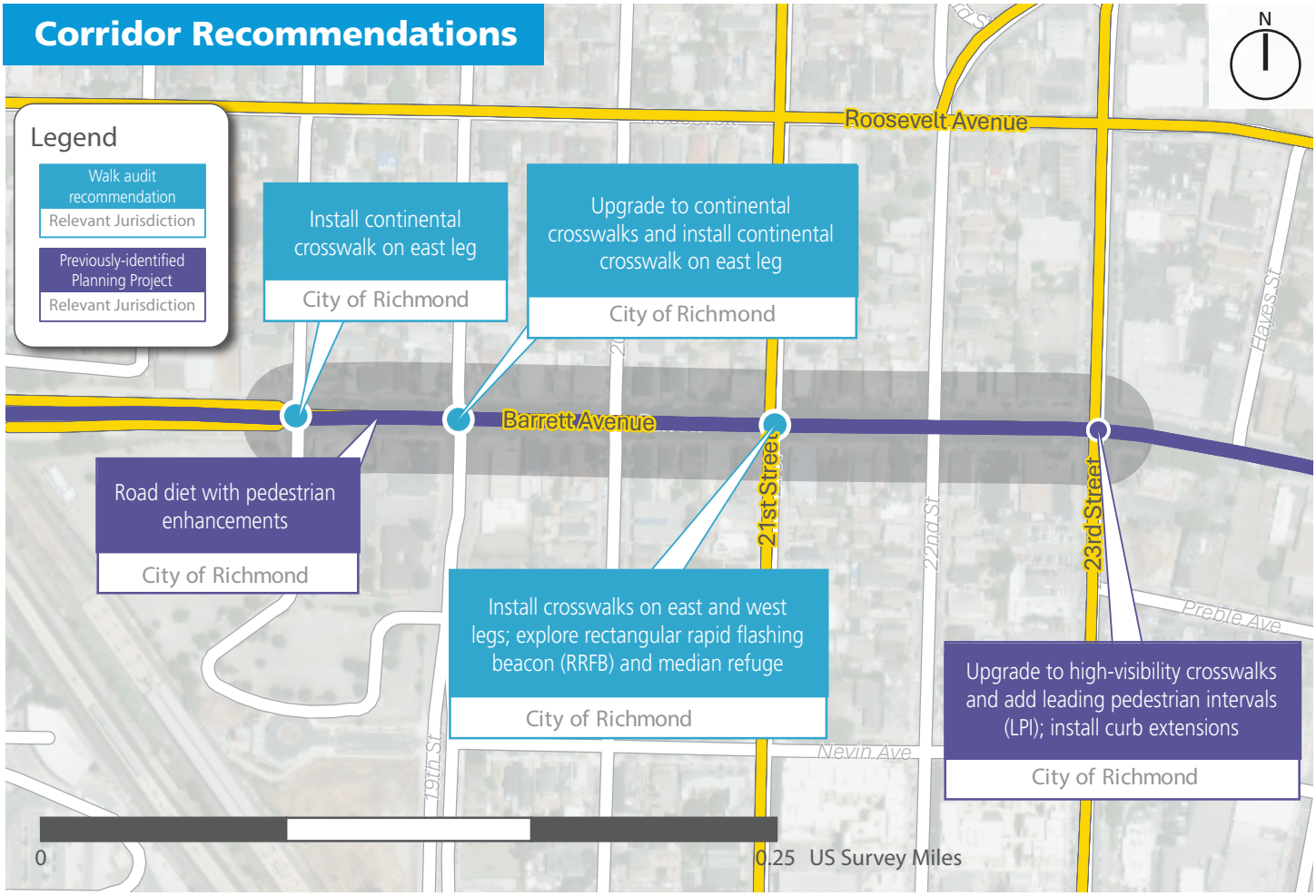
Focus Station Area Action Plan

3 Barrett Avenue from 18th Street to 23rd Street

Corridor Context

- Barrett Avenue is an east-west arterial with four lanes that runs through a residential neighborhood. The corridor has standard bike lanes between 2nd Street and 23rd Street and west of 24th Street to San Pablo Avenue.
- Survey respondents reported near misses on Barrett Avenue and observed vehicles not stopping for red lights.
- There were 38 collisions recorded on this corridor with one resulting in a fatality. Most of the collisions were related to violations of traffic signals and signs or automobile right-of-way.

Corridor Recommendations



Safety Benefits

FHWA Tier 1 Safety Countermeasures to Remove Severe Conflicts:

- Medians can help reduce speeds for vehicles turning left.

FHWA Tier 2 Safety Countermeasures to Reduce Vehicle Speeds:

- Roadway reallocation reduces the number of lanes and the distance pedestrians have to cross.

FHWA Tier 4 Safety Countermeasures to Increase Attentiveness and Awareness:

- High visibility crosswalks make crossing pedestrians more visible to drivers.
- Rectangular rapid flashing beacons increase driver awareness and yielding compliance.

Estimated Capital Cost

$20,000

In US Dollars 2025

Richmond

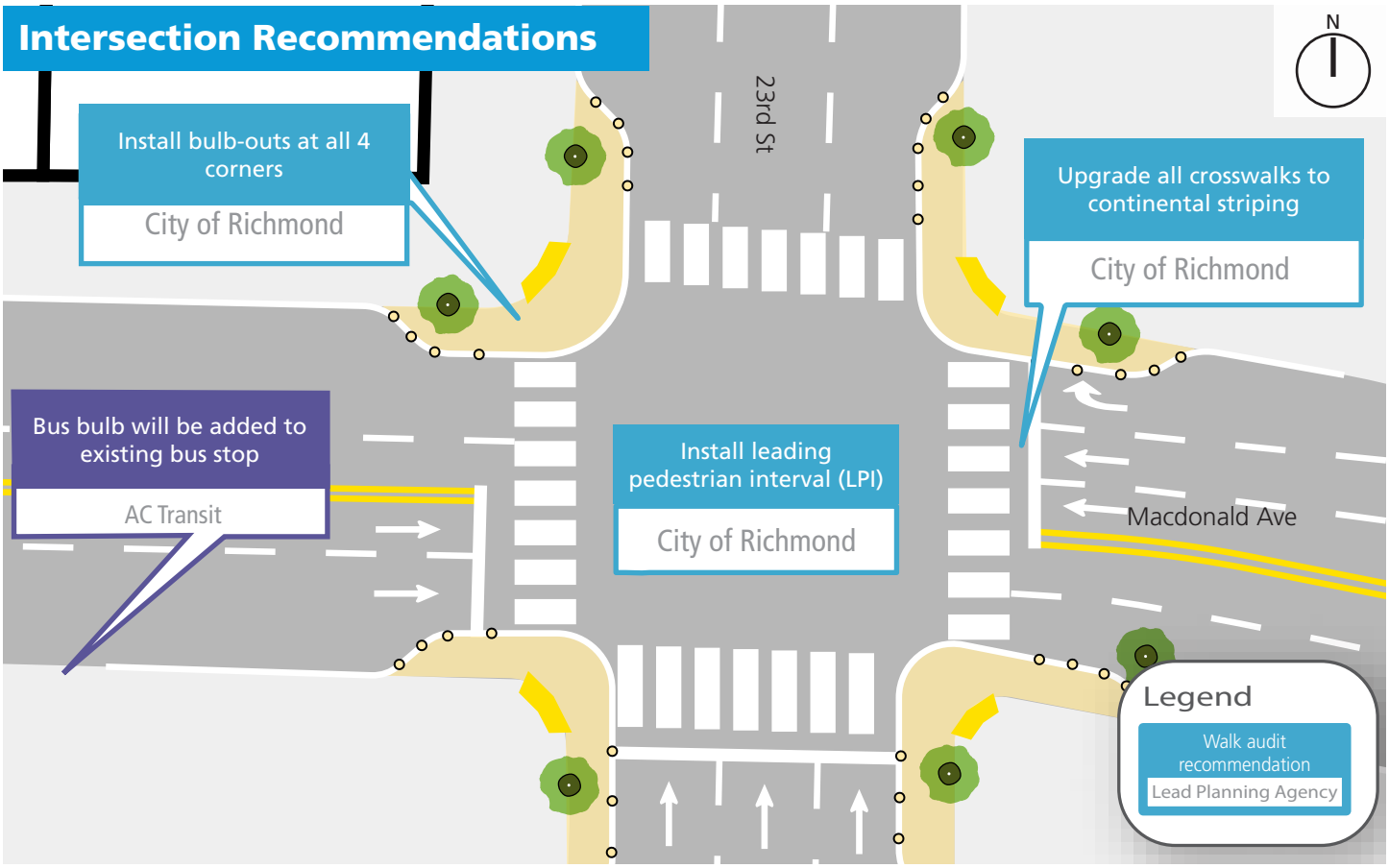
Focus Station Area Action Plan

4 Macdonald Avenue & 23rd Street

Intersection Context

- Macdonald Avenue and 23rd Street is the intersection of an east-west two-way arterial and a northbound one-way arterial. It is located near the Richmond Police Activities League which provides youth after school programs. Many students and families were observed in this area during the walk audit.
- Survey respondents reported frequent commercial loading activity at this intersection.
- Eight vehicle-to-vehicle crashes were recorded near this intersection from 2019 to 2023, and half of them were related to traffic signal or sign violations.

Intersection Recommendations



Safety Benefits

FHWA Tier 2 Safety Countermeasures to Reduce Vehicle Speeds:

- Bulbouts reduce the width of the roadway, reduce pedestrian crossing distance, and encourage drivers to reduce speed.

FHWA Tier 3 Safety Countermeasures to Manage Conflicts in Time:

- Upgraded signals with leading pedestrian intervals to provide pedestrians a head start before motorists are allowed to proceed through the intersection.

FHWA Tier 4 Safety Countermeasures to Increase Attentiveness and Awareness:

- High-visibility crosswalks make crossing pedestrians more visible to drivers.

Estimated Capital Cost

$30,000 (Quick Build) - $200,000

In US Dollars 2025