Appendix G. Focus Station Area Action Plan for Richmond

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.

Richmond

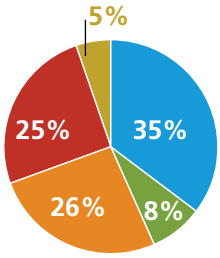
Focus Station Area Action Plan

Station at a Glance

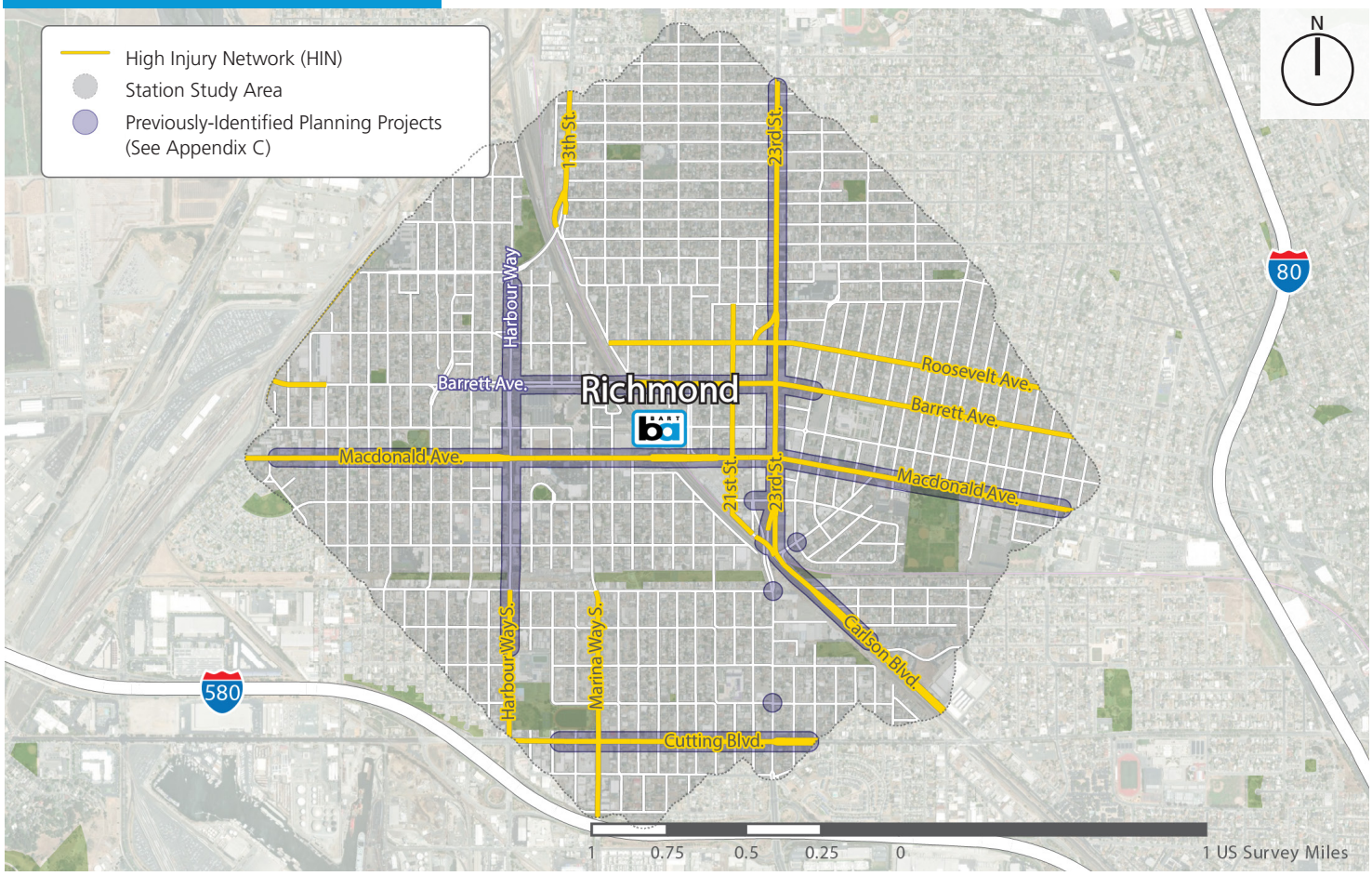
Station Access Type: Balanced Intermodal

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

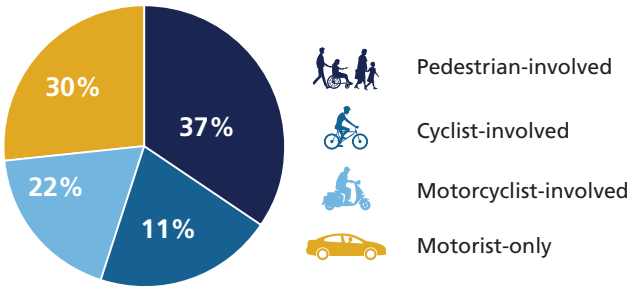
14% Percent of Station study area street miles on the HIN

50 Number of people killed or severely injured (KSI)

9% Percent of crashes that resulted in KSI

Killed/Severe Injury (KSI) Crashes

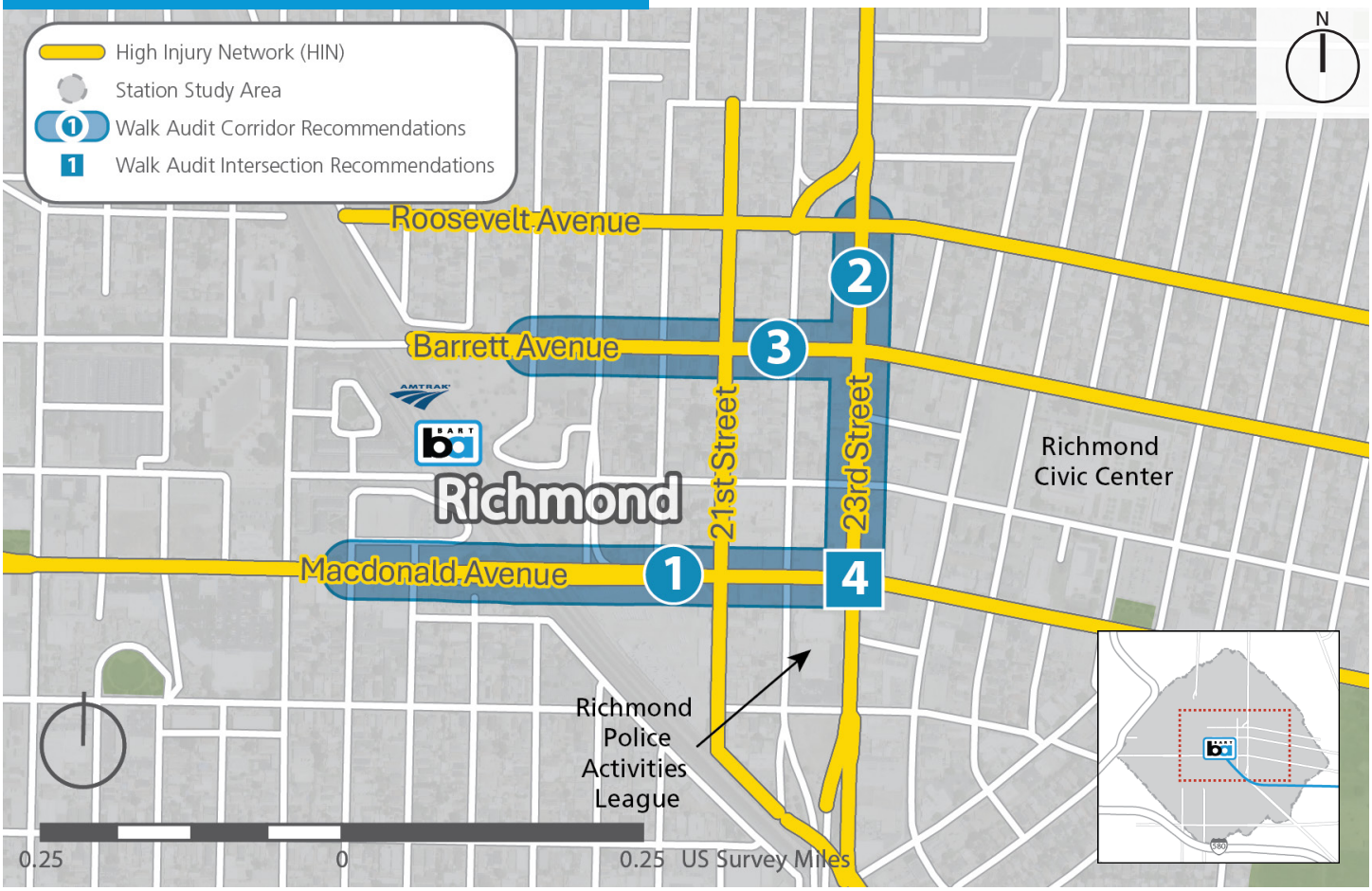
Total KSI: 50



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

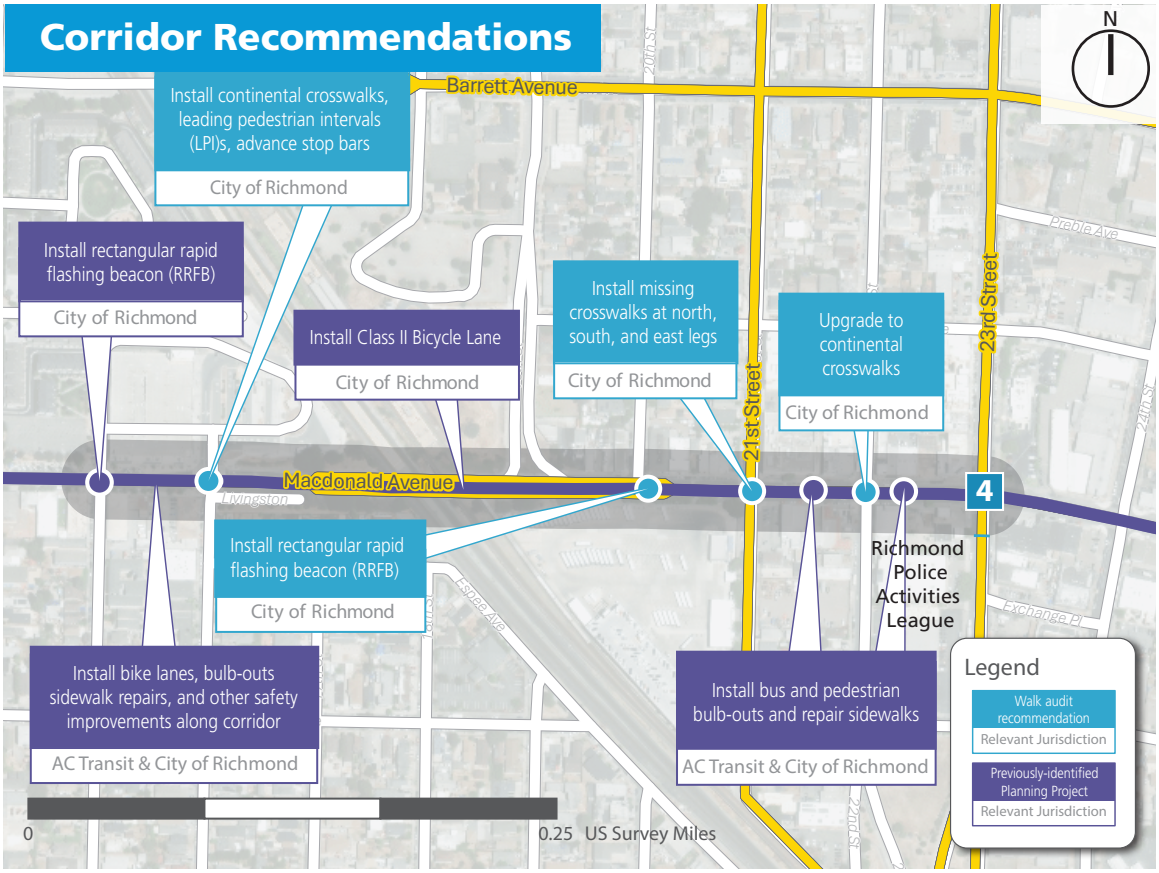
Focus Station Area Action Plan

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

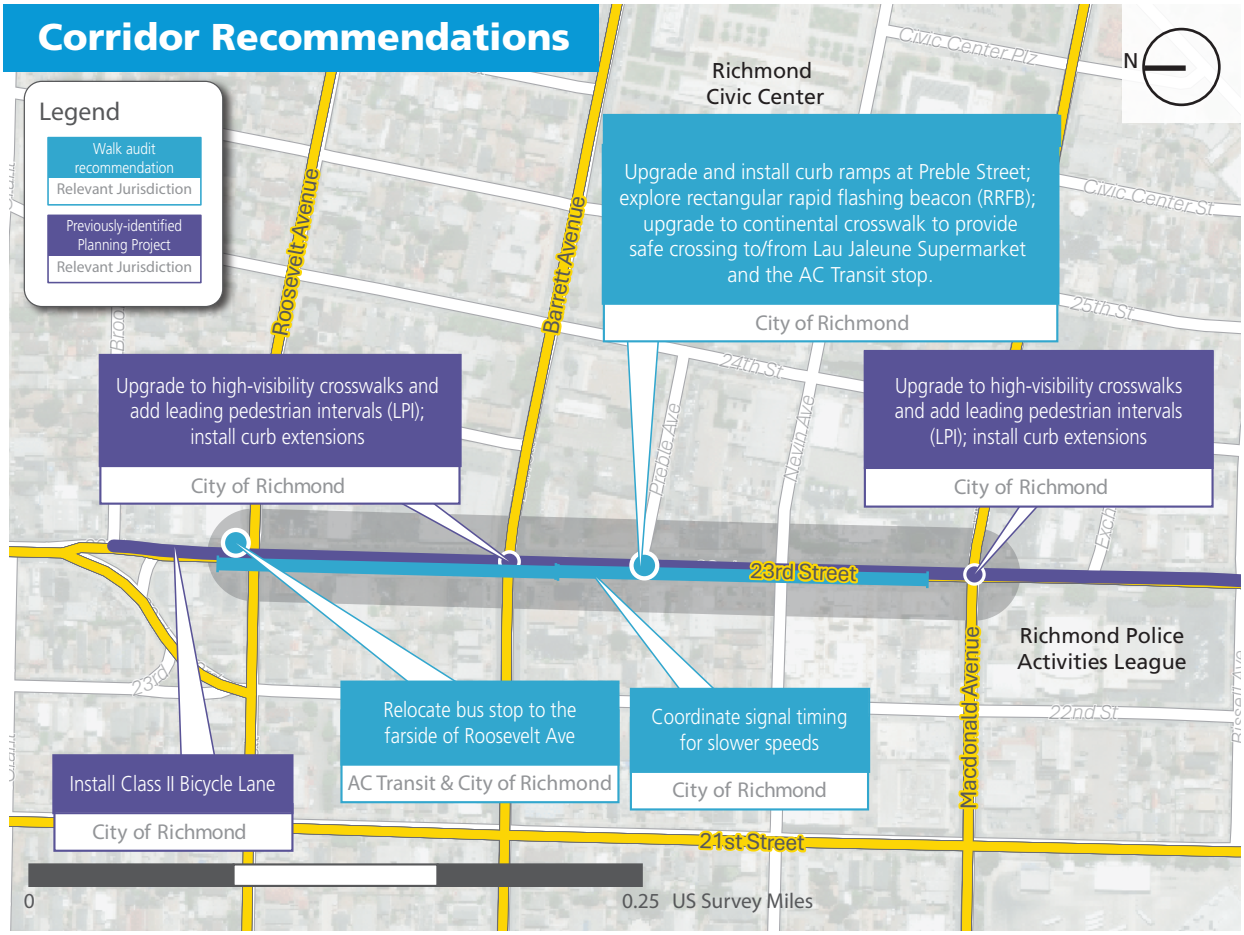
Focus Station Area Action Plan

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

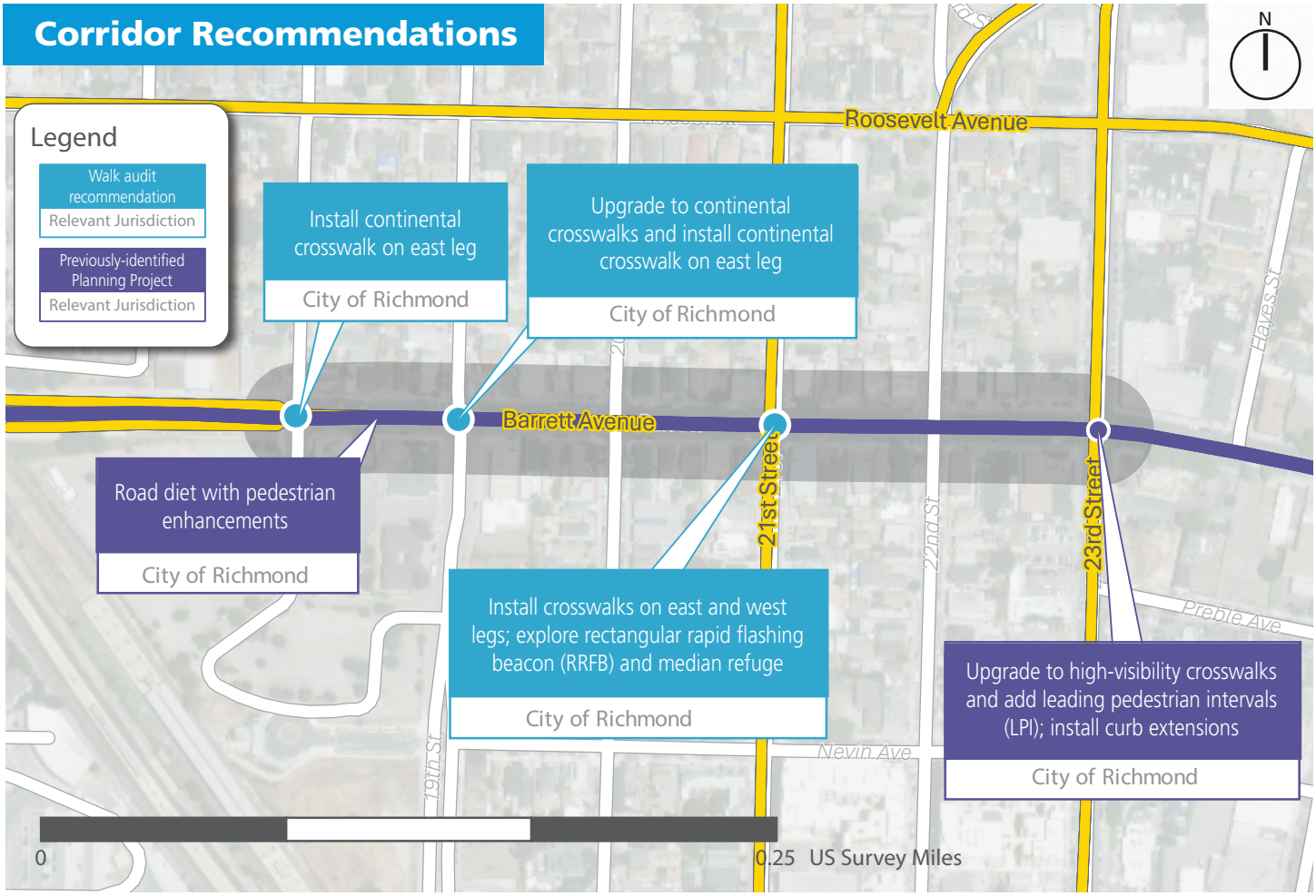
Focus Station Area Action Plan

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

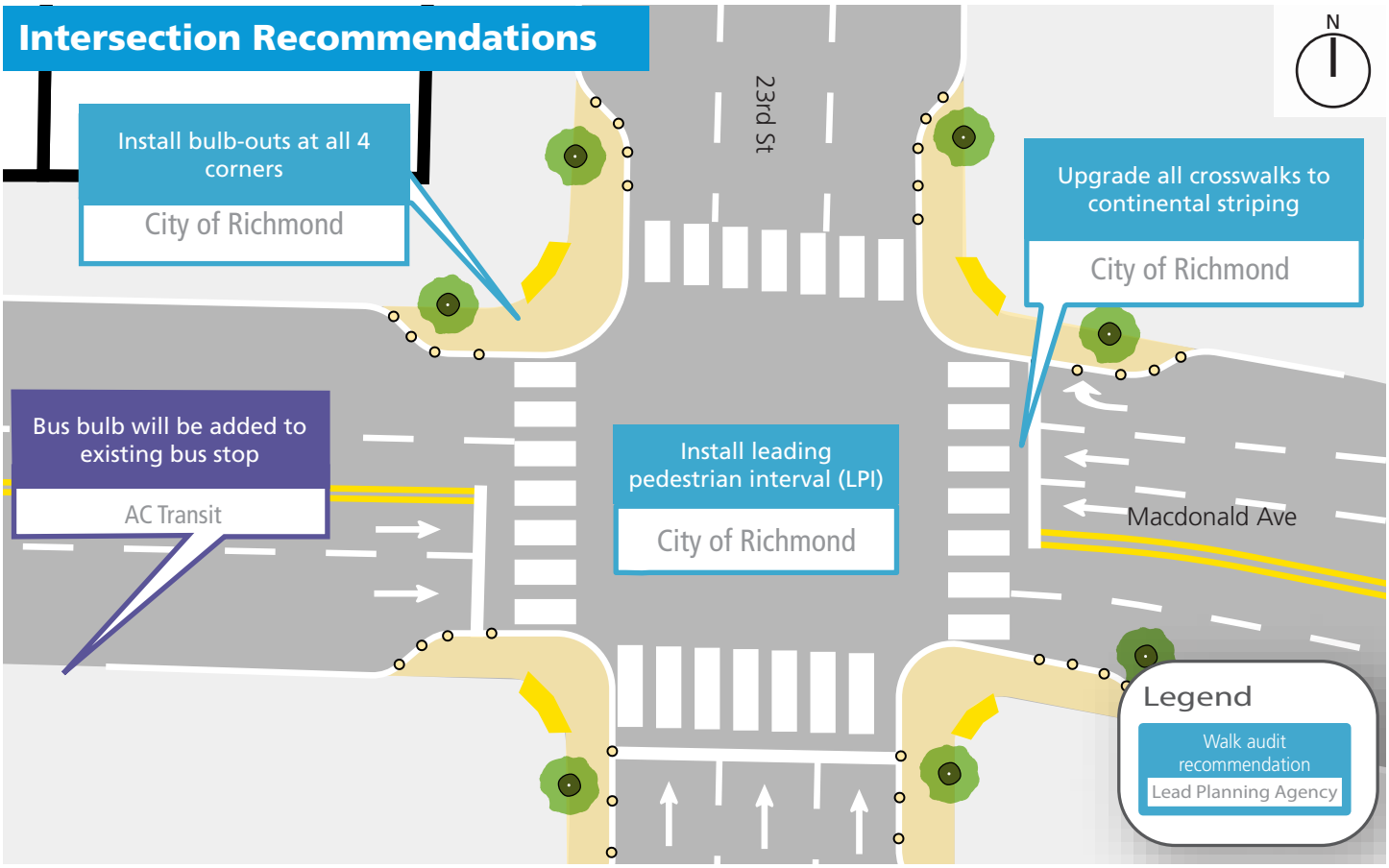
Focus Station Area Action Plan

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