Appendix G. Focus Station Area Action Plan for Milpitas

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.

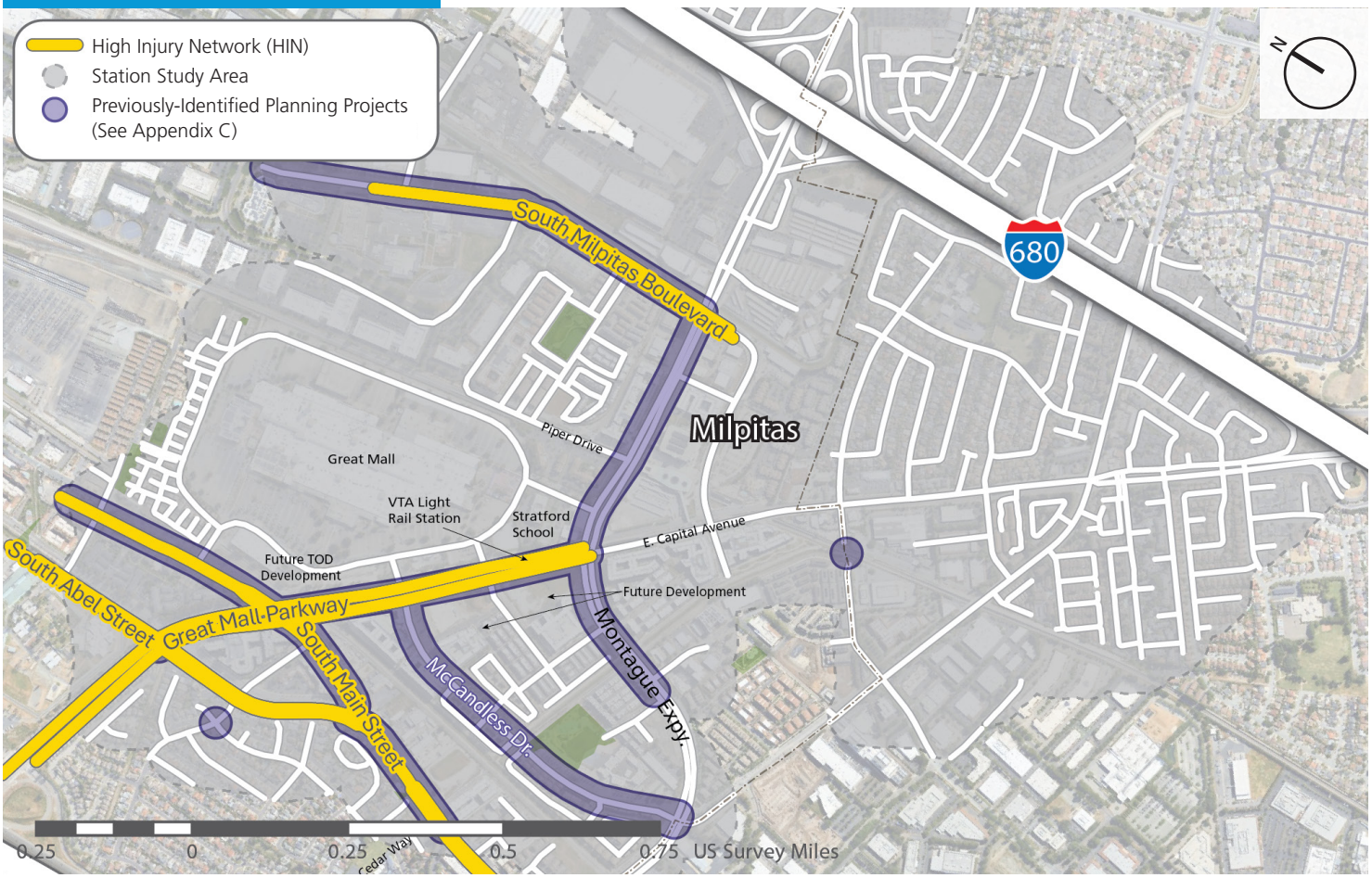
Milpitas

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

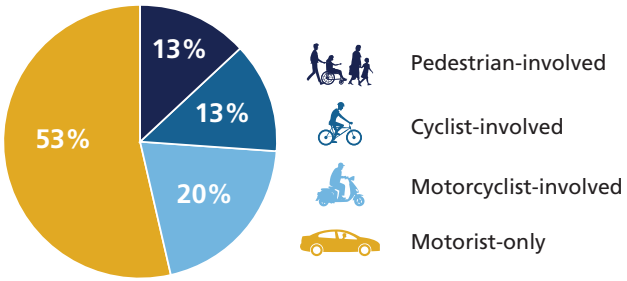
7% Percent of Station study area street miles on the HIN

15 Number of people killed or severely injured (KSI)

6% Percent of crashes that resulted in KSI

Killed/Severe Injury (KSI) Crashes

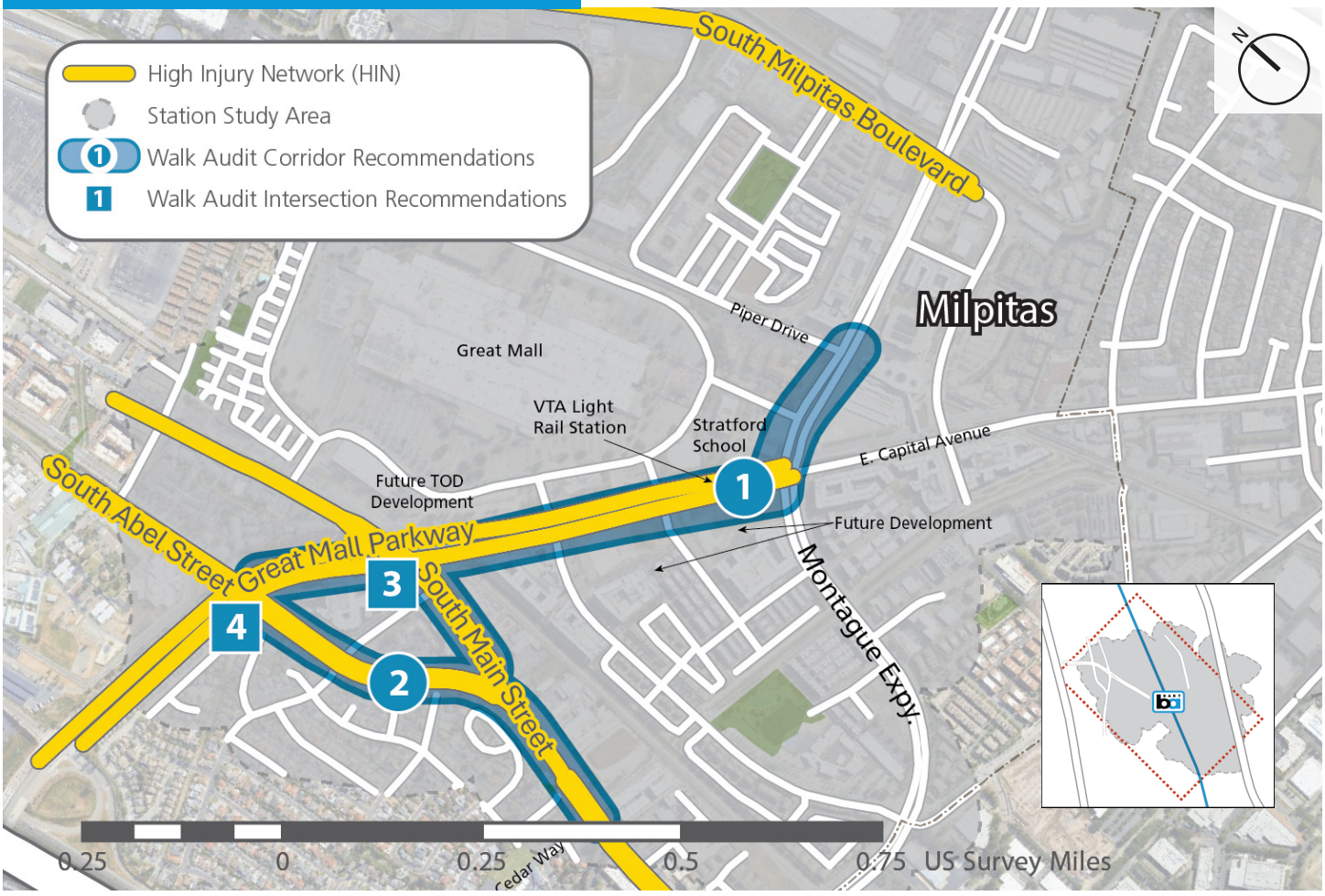
Total KSI: 15



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

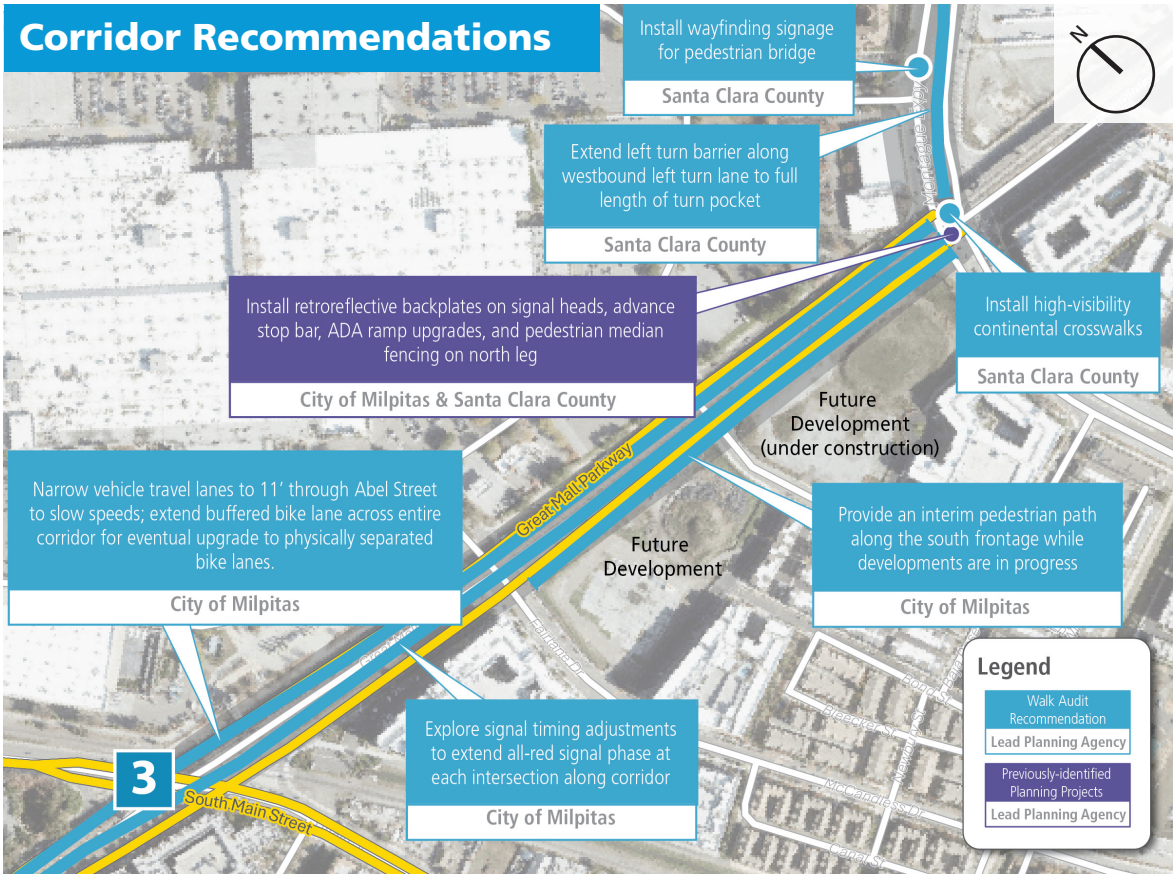
1 Montague Expressway & Piper Drive to Great Mall Parkway & Main Street

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

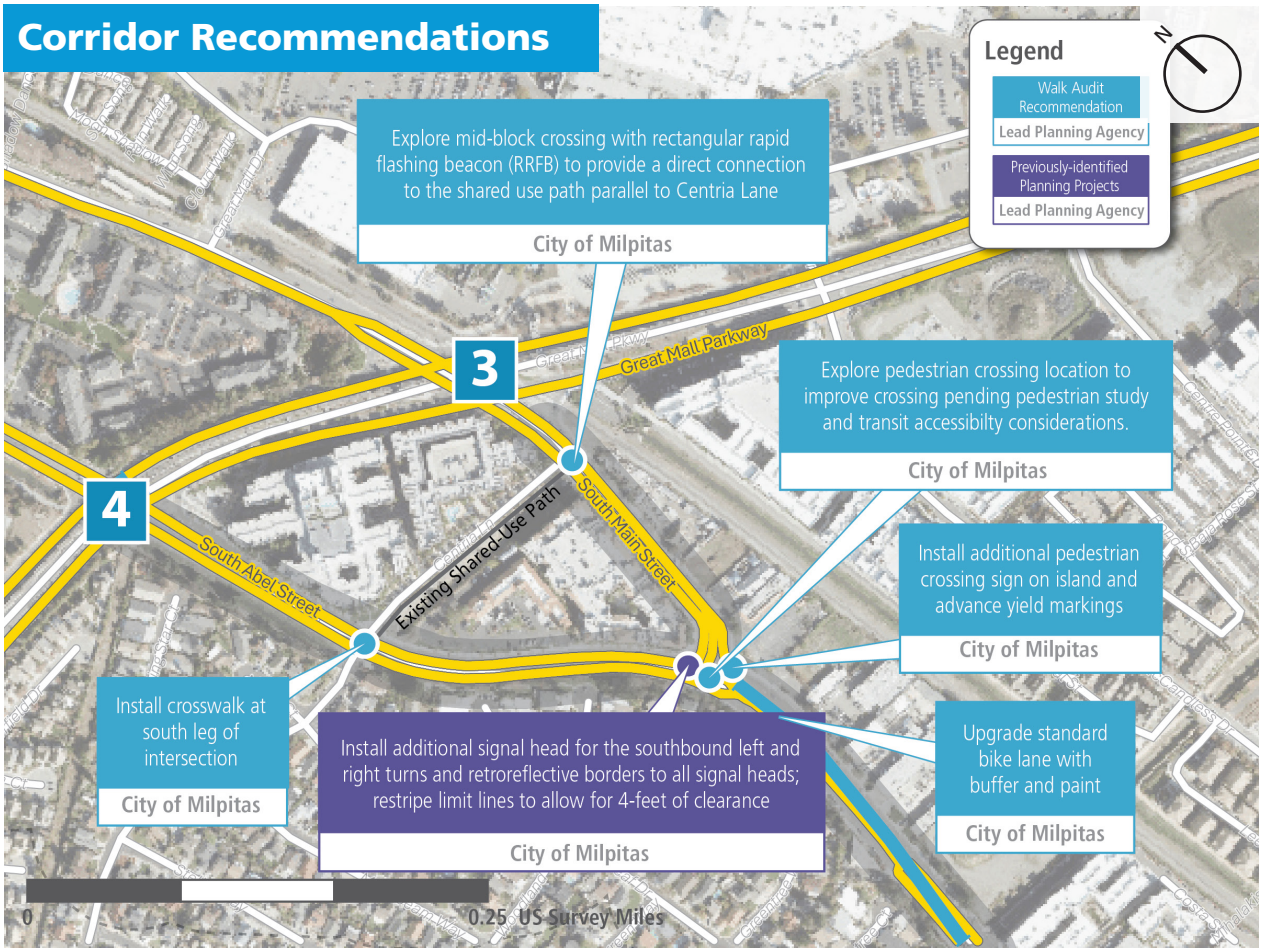
Focus Station Area Action Plan

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

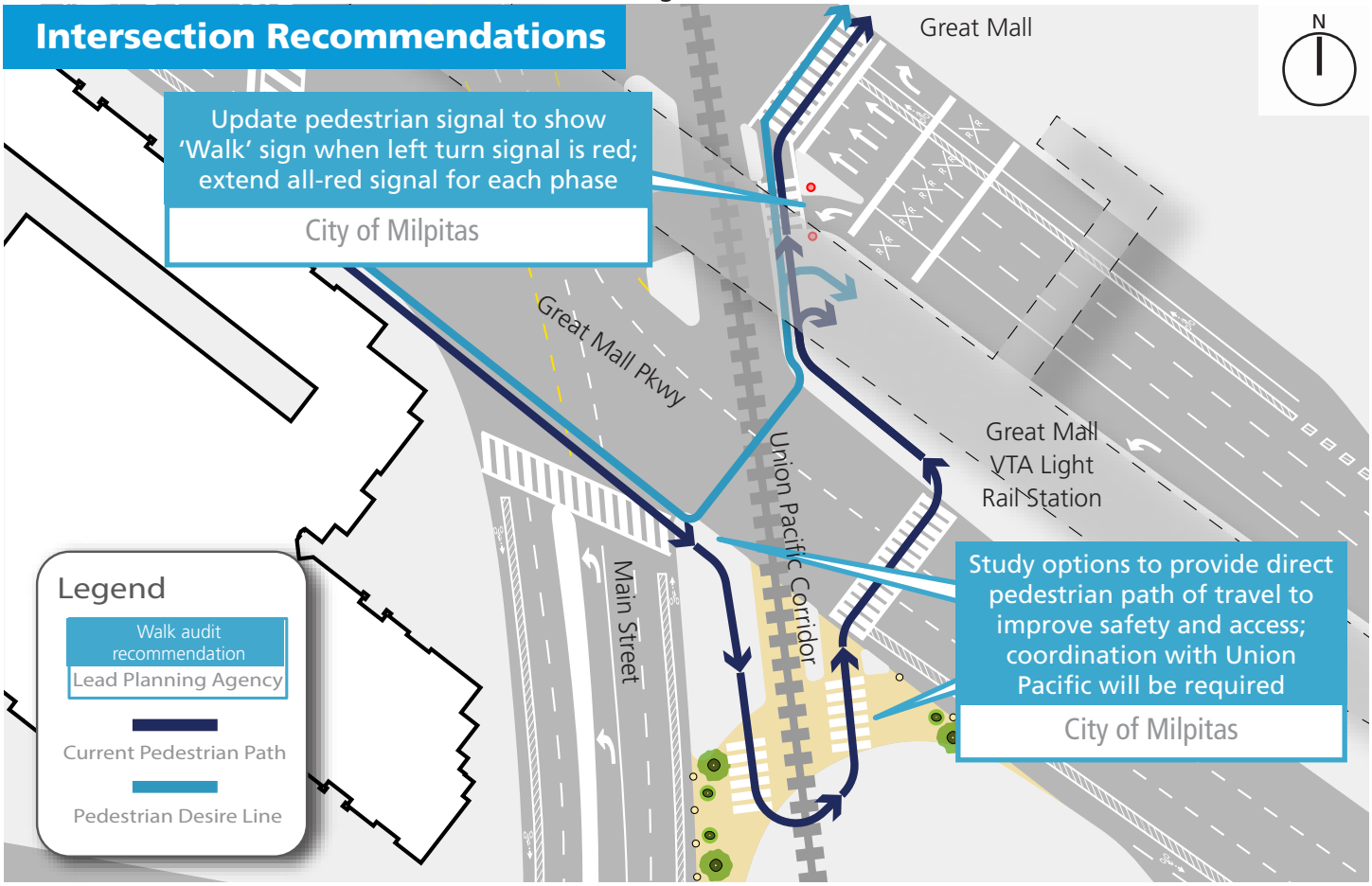
Focus Station Area Action Plan

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

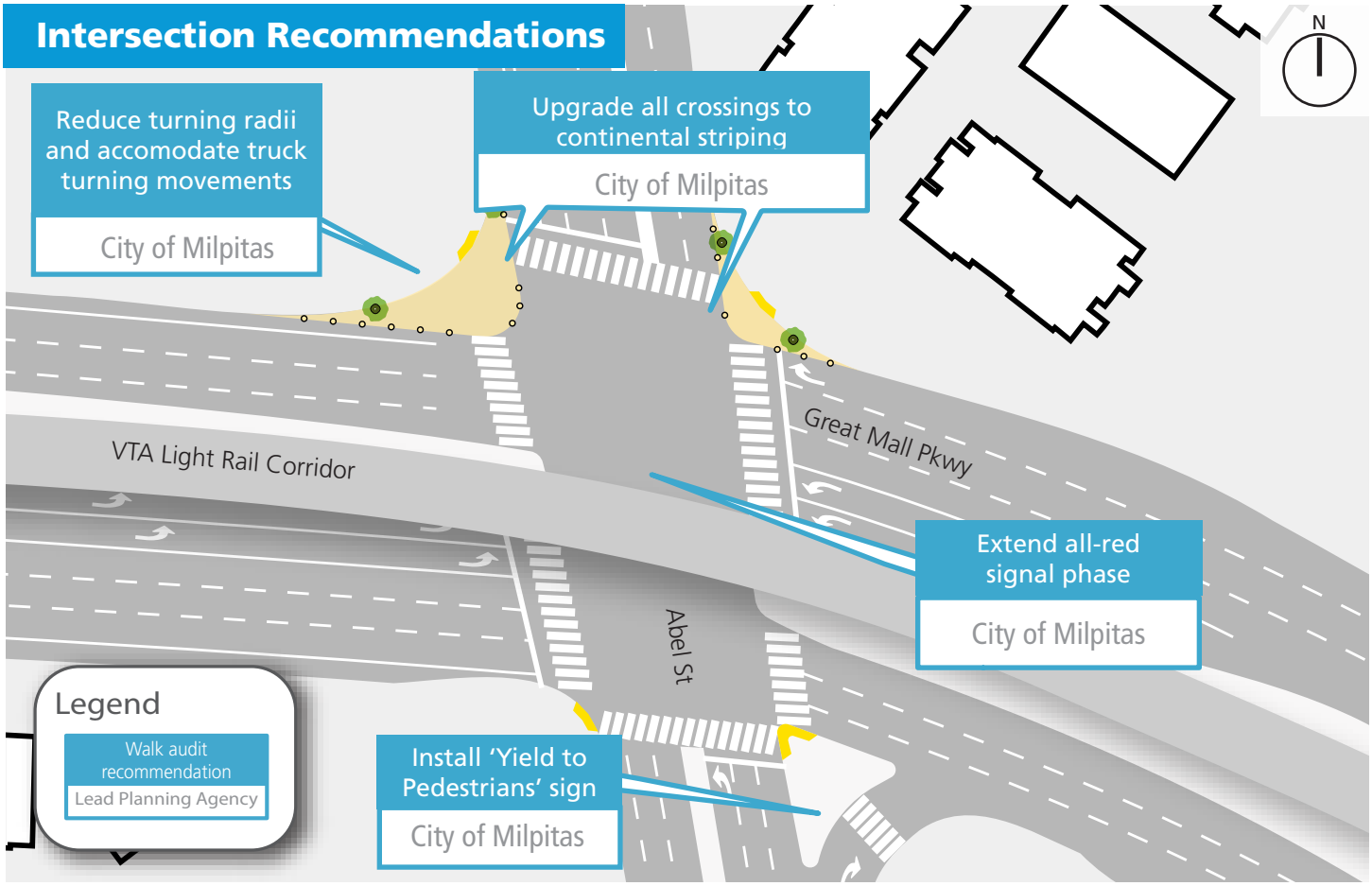
Focus Station Area Action Plan

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