Minneapolis Systematic Street Safety Improvements Proposal Narrative

2023 SAFE STREETS FOR ALL IMPLEMENTATION GRANT

CITY OF MINNEAPOLIS

Minneapolis
City of Lakes

VISION ZERO

Table of Contents

OVERVIEW

This proposal includes the highest priority unfunded projects and actions in the 2023-2025 Minneapolis Vision Zero Action Plan[1]:

- Systematic proven safety countermeasures along 25 miles of High Injury Streets, including:
    - Pedestrian safety islands and intersection median islands;
    - Protected bike lanes and protected intersection safety treatments;
    - High visibility marked crosswalks and rectangular rapid flashing beacons (RRFBs);
    - Lane safety conversions (road diets); and
    - Intersection street lighting upgrades.
- Systematic traffic signal proven safety countermeasures at 526 intersections.
- Mobile speed wagon and in-street pedestrian crosswalk sign programs.
- Supplemental road safety planning work:
    - Speed data collection to inform planning and evaluation;
    - Traffic safety camera pilot development;
    - Speed limit change evaluation;
    - Quick-build safety treatment evaluation;
    - Analysis to support state rule development to better support speed management; and
    - Roundabout evaluation.

Note: the traffic safety camera pilot work in the application was not funded.

SS4A funding will allow Minneapolis to deliver safety improvements on nearly all High Injury Streets not already planned for significant safety treatments (see Figure 1 on page 3). Without this funding, it likely will take decades to fund these needed safety improvements.

Addressing increase in fatal and serious crashes since 2020

This proposal will allow Minneapolis to address increasing road safety challenges since 2020. There have been significant safety improvements in the places where we have invested in systematic safety treatments in recent years. However, in places where we have not yet been able to implement safety improvements, serious and fatal crashes have increased in recent years. 2021 and 2022 had 26 fatal crashes each year—the most of any year in Minneapolis with comparable data (since at least 2006) and more than double the number in 2018 and 2019[2]. There were 206 serious crashes in 2022, which is more than any year with comparable data (since 2016). Increased speeding is driving these increases[3].

[1] Minneapolis adopted a Vision Zero policy in 2017. Appendix A includes key Vision Zero timeline notes.

[2] Source: FARS for 2021 and earlier data; FARS data only go back to 2006. Minnesota Department of Transportation Minnesota Crash Mapping Analysis Tool for 2022 data.

Targeting leading crash factors
Treatments in this proposal focus on systematically addressing the three leading factors in serious and fatal crashes in Minneapolis: drivers speeding, drivers turning (especially left turns), and drivers running red lights[4]. The Safety Impact section on page 4 has more details.

Investing in equity
Serious and fatal crashes in Minneapolis disproportionately impact residents in underserved communities, Black and Native American residents, and people walking, biking, and rolling. To address the disproportionate impacts of crashes in these areas, 71% of funding goes to projects or actions in areas identified as disadvantaged in the Climate and Economic Justice Screening Tool (see Figure 1 on page 3).

Prioritizing people walking, rolling, and biking
This proposal prioritizes safety investments for the most vulnerable road users in line with the City's Complete Streets policy.

Location

Minneapolis is a diverse and vibrant city of nearly 430,000 residents and the economic center of the Minneapolis-St. Paul metropolitan region. The 2023-2025 Minneapolis Vision Zero Action Plan identifies 112 miles of High Injury Streets (see Figure 1 on page 3). These streets had 66% of serious and fatal crashes in Minneapolis between 2017 and 2021 despite comprising only 9% of all street mileage. High Injury Streets are more than twice as likely to be in the highest City-identified Transportation Equity Priority Areas.

Selection of proposed projects and actions
The City evaluated all High Injury Streets for potential corridor projects in this proposal.

1. To maximize return on investment, corridors were excluded if they are already programmed or planned for major safety treatments in the next 10 years.
2. All remaining corridors were evaluated for the potential for cost-efficient proven safety countermeasures that address their safety challenges. High Injury Streets where effective safety countermeasures can be added cost-efficiently are included in this proposal.

The City also identified traffic signals without retroreflective backplates or pedestrian countdown timers—two cost-efficient signal safety treatments—that are not already planned to be upgraded in coming years through other funding sources. Figure 1 shows the location of corridor projects and signals included in this proposal. Low-cost systemwide education programs for mobile speed wagons and in-street pedestrian crosswalk (R1-6) signs are also included.

[3] Clear speeding was involved in 65% of fatal crashes in Minneapolis in 2021 and 2022 compared to 39% for 2017-2019. Source: 2022 Vision Zero Crash Study and Public Works staff review of fatal crash reports.

[4] Source: 2022 Minneapolis Vision Zero Crash Study.

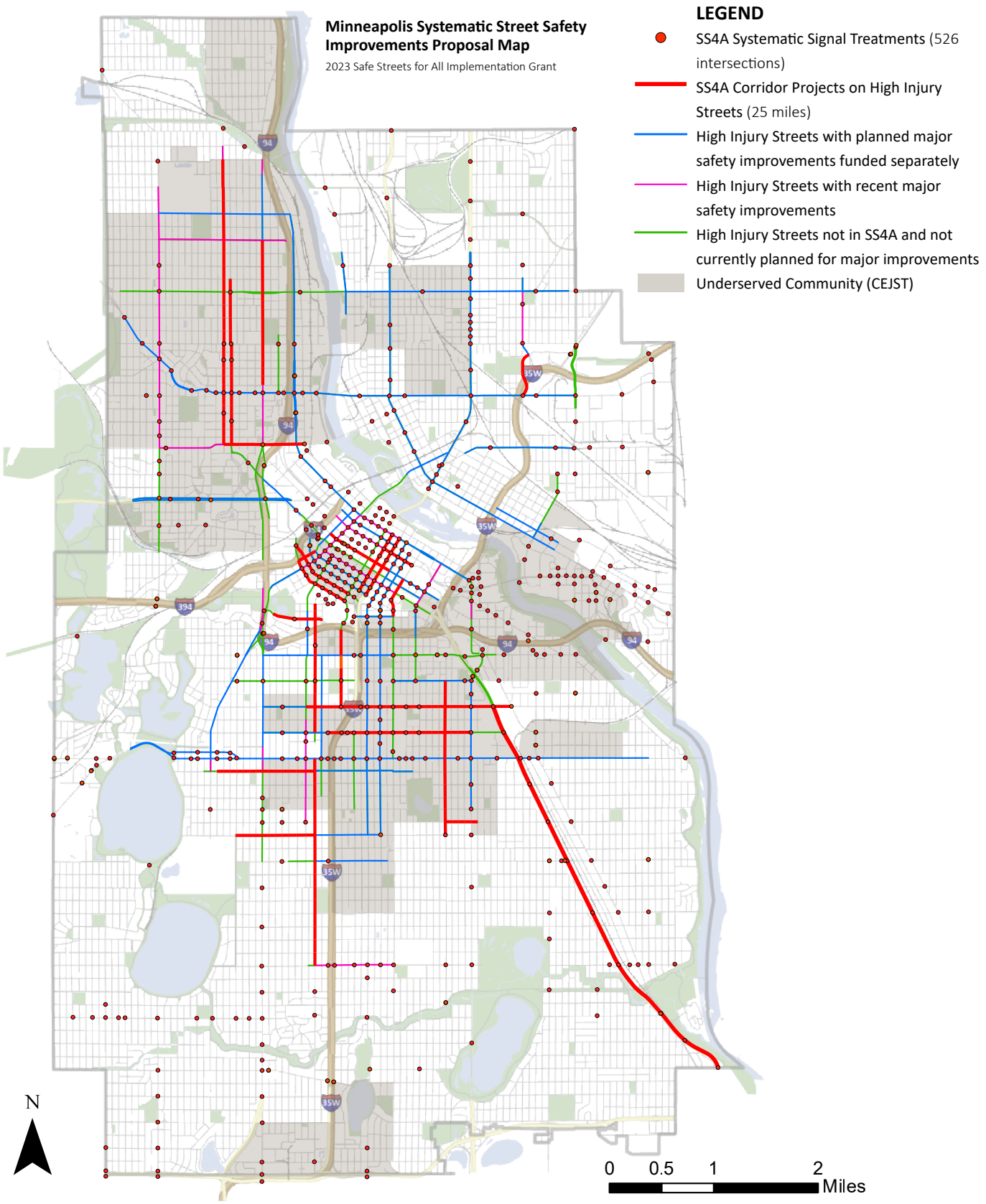


Figure 1: Minneapolis proposal locations and High Injury Streets

RESPONSE TO SELECTION CRITERIA

Safety Impact

Safety problem

In Minneapolis, people experienced 82 fatal traffic crashes (where 89 lives were tragically lost) and 756 serious injury traffic crashes from 2017-2021[5]. The 2022 Vision Zero Crash Study includes detailed analysis of all fatal and serious injury crash reports. That analysis informs the Vision Zero Action Plan and this proposal.

SAFETY PROBLEM	PROPOSAL ADDRESSES BY	
Severe & fatal crashes are concentrated on High Injury Streets (66% on 9% of streets)	Focusing on systematic treatments on High Injury Streets	
Driver speeding is a significant challenge (involved in at least 50% of fatal crashes and 15% of serious crashes) and has gotten much worse since 2020	Focusing on supporting safe speeds	
67% of serious/fatal crashes happen at intersections and 46% happen at signalized intersections	Prioritizing intersection treatments and including systematic signal safety treatments	
People walking and rolling are overrepresented in serious and fatal crashes (31% of serious injuries/deaths vs. 16% of trips) as are people biking (11% vs. 3%)	Prioritizing treatments for walking, rolling, and biking	
Nighttime crashes make up a disproportionate share of serious and fatal crashes (42%)	Upgrading intersection lighting	
Serious and fatal crashes are disproportionately concentrated in underserved communities (28% of residents live in the highest City-identified Transportation Equity Priority areas, but 43% of serious and fatal crashes occurred in these areas)	Prioritizing corridors in underserved communities	

[5] Source: FARS for fatal crashes and Minnesota Crash Mapping Analysis Tool for serious injury crashes.

Proposal corridor projects safety problem and treatments
This proposal includes five types of corridor projects. *See below for more details on each.*

- **2-lane two-way High Injury Streets**
- **Downtown 3-lane one-way High Injury Streets**
- **One-way High Injury Streets outside of downtown**
- **4-lane undivided High Injury Streets**
- **Hiawatha Avenue** *(a High Injury Street that does not bundle with other corridors)*

Corridor projects in this proposal had 13 fatal and 110 serious injury crashes from 2017-2021 that relate to the proposed safety countermeasures (see attached project location crash data). The planned treatments in this proposal reflect safety analysis, initial planning review of each corridor, and high-level engineering feasibility analysis. The proposal focuses on treatments that can be installed cost effectively across many miles of streets. Final detailed treatments and designs will be determined by additional technical analysis, community engagement, and detailed design and engineering. Through that detailed process, some planned treatments may be adjusted while retaining the core safety focus and treatments for each corridor. See Appendix B for list of all corridor projects and planned treatments.

2-LANE TWO-WAY HIGH INJURY STREETS

Twelve proposal corridors are 2-lane two-way High Injury Streets. These are collector or minor arterial streets. All are identified on the City's Pedestrian Priority Network and pedestrians are 30% of serious and fatal crashes. Most have transit routes. Two of these corridors have bike lanes on a majority of their extent. Speeding and failure to yield while turning are the leading factors in serious and fatal crashes on these corridors. Nighttime crashes, intersection crashes, and signalized intersection crashes are a similar share to citywide.

Planned systematic safety countermeasures for these corridors include[6]:

- Intersection medians at signalized intersections;
- Pedestrian safety islands at unsignalized intersections;
- Intersection lighting upgrades where current lighting does not meet safety standards;
- High-visibility continental marked crosswalks and signage at many locations and RRFBs at 2 higher traffic and higher pedestrian locations; and
- Protected bicycle lanes and protected intersection features if a planned near-term low stress bikeway.

DOWNTOWN 3-LANE ONE-WAY HIGH INJURY STREETS

Six proposal corridors are 3-lane one-way High Injury Streets in downtown. These are minor arterial streets with high pedestrian demand and signals at all intersections. Serious and fatal crashes are even more likely to be at intersections than citywide and include more people biking (29%). Failure to yield while turning is the leading factor in serious and fatal crashes followed by running red lights while speeding. Nighttime crashes are notably lower than citywide, likely in part due to the high-quality existing street lighting.

[6] In this proposal, "systematic treatments" are safety countermeasures applied consistently at similar locations along a corridor to address identified crash history and crash risks.

Planned systematic safety countermeasures for these corridors include:

- Protected bike lanes;
- Bikeway medians at intersections and other protected intersection treatments; and
- General 3-to-2 lane conversion with turn lanes where appropriate[7].

ONE-WAY HIGH INJURY STREETS OUTSIDE OF DOWNTOWN

Four proposal corridors are one-way High Injury Streets outside of downtown. These are minor arterial streets with existing flexible delineator protected bike lanes. They are on the City's Pedestrian Priority Network. Angle crashes, often connected with high-speed red light running, and nighttime crashes are particular road safety challenges.

Planned systematic safety countermeasures for these corridors include:

- Intersection median islands adjacent to the bikeway;
- High-visibility continental marked crosswalks and signage at some locations; and
- Intersection lighting upgrades where current lighting does not meet safety standards

4-LANE UNDIVIDED HIGH INJURY STREETS

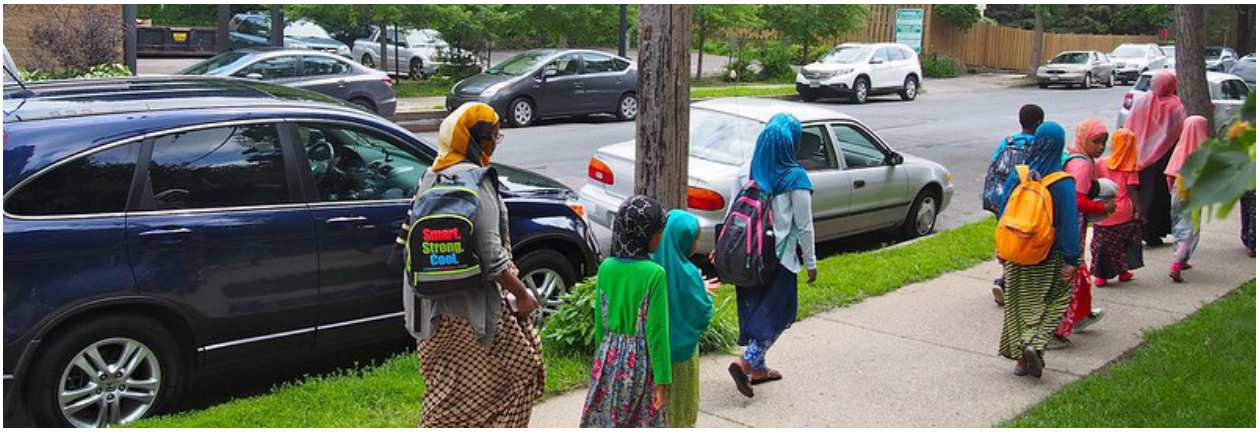
Two short proposal corridors are 4-lane undivided High Injury Streets, which have well documented safety challenges in urban areas generally and in Minneapolis, especially related to left-turn crashes and speeding. One of these corridors has existing unprotected bike lanes while the other is a gap in a planned low-street bikeway.

Planned systematic safety countermeasures for these corridors:

- 4-to-3 lane conversions with dedicated left-turn lanes at intersections;
- Intersection median islands; and
- Protected bike lanes.

HIAWATHA AVENUE

Hiawatha Avenue is High Injury Street and a divided principal arterial street with signalized intersections. Full corridor safety treatments were not cost efficient with this proposal, but this proposal includes safety-focused signal coordination to address challenges with rear-end crashes and red light running.



[7] High-level traffic analysis shows that general 3-to-2 lane conversions are very likely feasible on most or all of each corridor. Final traffic analysis as part of forthcoming transit priorities study will determine detailed configurations and whether transit priority lanes will be included on any corridors (any transit priority lanes would be funded separately)

Total planned corridor project treatments

PROVEN SAFETY COUNTERMEASURE	TARGETING	QUANTITY
Center medians at signalized intersections	Speeding, vehicle turns, red light running, bike & roll safety	**89**
Bikeway medians/protected bikeway intersection treatments at signalized intersections	Vehicle turns, speeding, bicycles	**120**
Pedestrian safety islands or bikeway medians at unsignalized intersections	Speeding, vehicle turns, pedestrian crossings, bicycles	**179**
Protected bike lanes	Bicycles	**4 miles**
Intersection lighting upgrades	Nighttime	**65 intersections**
4-to-3 lane safety conversions	Speeding, vehicle turns, pedestrian crossings	**2/3 mile**
3-to-2 lane one-way street safety conversions	Speeding, pedestrian crossings	**3 miles**
Marked crosswalks	Pedestrian crossings	**36**
Safety-focused signal operations (High Injury Street)	Speeding and red light running	**4 miles**
Rectangular rapid flashing beacons	Pedestrian crossings	**2**

Systemwide projects

This proposal includes 4 low-cost systemwide projects targeting key safety challenges:

PROVEN SAFETY COUNTERMEASURE	TARGETING	QUANTITY	DEPLOYMENT DETAILS
Retroreflective backplates	Red light running, nighttime	**512 intersections**	At all signals citywide that do not currently have them and are not already planned for signal upgrade.
Pedestrian countdown timers	Pedestrian crossings	**49 intersections**	At signals on High Injury Streets or Pedestrian Priority Network streets where they do not currently exist and are not already planned for signal upgrade.
Movable speed trailer program	Speeding	**4 years**	Expand strategic deployment of speed feedback signs focused on High Injury Streets to reinforce speed limits.
In-street pedestrian crosswalk sign (R1-6) program	Pedestrian crossings	**4 years**	Manage in-street “State law: stop for pedestrians in crosswalk” (R1-6) signs to support other pedestrian crossing treatments in this proposal. Deployment will be focused on High Injury Streets.

Impact in Minneapolis

Through the Safe Streets for All grant, **low-cost, high-impact systematic safety improvements** will have a dramatic benefit throughout Minneapolis.

Low cost

Low-cost improvements cover more ground- making sure impacts are felt citywide. **690 intersections** will be included in corridor projects or have signal countermeasures

High impact

High-impact proven safety countermeasures mean more lives saved. Corridor projects **address 13 fatal and 110** serious injury crashes from 2017-2021

Systematic improvements

Systematic improvements on High Injury Streets will prevent serious crashes before they occur. **25 miles** of High Injury Streets will be improved

Equity, Engagement, and Collaboration

Equitable investment in underserved communities
Minneapolis has done detailed equity analysis to inform all transportation planning work, including the Vision Zero Action Plan and this proposal.

There are unacceptable transportation-related economic and racial disparities Minneapolis:

- Serious and fatal crashes and High Injury Streets are disproportionately concentrated in underserved communities.
- Native American residents are disproportionately impacted by fatal traffic crashes and Black residents are disproportionately impacted by fatal vehicle crashes.
- Average commute times are longer for Black and Latino residents than white residents.
- Household car access is lower for Black, Indigenous, and People of Color residents than for white residents.
- Air quality is worse on average for lower income residents and Black, Indigenous, and People of Color residents because they are more likely to live near freeways.
- Urban heat island impacts are generally worse in underserved communities.
- Black, Indigenous, and People of Color individuals are more likely to be stopped for a traffic violation when it is light outside and race is potentially visible than when it is dark outside and race of individuals is harder to determine. Black and white individuals are treated differently during traffic stops in a variety of problematic ways, including higher likelihood of searches, citations, lengthy stops, use of force, and arrest.

This proposal:

- Prioritizes addressing disparities in traffic crashes. 71% of funding goes to projects or actions in underserved areas.

- Aligns with the recently adopted Minneapolis Racial Equity Framework for Transportation. This plan helps guide our work to achieve fair and just opportunities and outcomes for all people, reverse racial disparities, eliminate institutional racism, and ensure that outcomes and opportunities are no longer predictable by race.
- Improves safety and access for people who rely on walking, biking, and transit in areas of Minneapolis where car access is the lowest.
- Adds greening (in intersection islands) in areas that have the worst heat island effects.
- Improves road safety while reducing the need for traffic enforcement.

Equitable engagement
This proposal is informed by robust previous planning engagement and includes additional equitable engagement on corridor projects and some of the supplemental planning efforts.

Engagement that informs this proposal
The Vision Zero Action Plan, which guides this proposal, was informed by significant community engagement that included focused engagement with traditionally underrepresented community groups, including youth, young adults, seniors, people with disabilities, Native American residents, Black residents, Latino residents, Southeast Asian residents, East African residents, residents living in public housing, and people using High Injury Streets in areas with lower incomes. This engagement included a variety of strategies, including focus groups and street intercept surveys in multiple languages, and contracts with community-based organizations to support culturally relevant engagement with trusted community partners. A common theme was a desire to improve roadway safety, especially for pedestrians. Other themes included requests for improved street lighting and addressing speeding and running red lights.

Engagement planned with this proposal
This proposal includes specific engagement funding to support engagement strategies focused on traditionally underrepresented community groups. This engagement will include multi-year contracts with community-based organizations and likely partnerships with City cultural community engagement staff and the Health Department. A variety of engagement tactics will be used to ensure that residents, businesses, and other community members are informed and consulted. Extra engagement is planned with the traffic safety camera pilot program development.

Effective Practices and Strategies

This proposal includes effective systematic Safer Roads, Safer Speeds, and Safer People strategies. The City will use a range of effective practices and strategies that are embedded in the way Public Works delivers transportation projects. Additional details include:

- Policies, guidelines, and standards: Minneapolis created the Street Design Guide to build the Safe System approach and FHWA Proven Safety Countermeasures into all capital projects. The City regularly updates the Guide with new details to reflect leading Safe System guidance. The City also uses other guidance and standards, including the MUTCD and the NACTO Urban Street Design Guide.
- Efficiency: This proposal focuses on maximizing cost efficiency of safety treatments. Our treatments generally do not impact curbs or drainage structures. Installation of corridor

projects will align with any upcoming street projects. Treatments are consistently applied along corridor project, which creates efficiency in all stages of project delivery.

- Complete Streets, land use, and multimodal networks: This proposal focuses on treatments that will make walking, biking, and taking transit safer, easier, and more comfortable in line with the City's Complete Streets policy. This contributes to our mode shift goal of having 3 of every 5 trips taken by walking, biking or transit by 2030 and aligns with the Minneapolis 2040 comprehensive plan.

Other USDOT Strategic Goals

By increasing safety, this proposal supports City mode shift goals to increase walking, biking, and transit to 60% of all trips by 2030. This will reduce pollution and greenhouse gas emissions, support affordable transportation options, support multimodal options, and enhance quality of life in our vibrant and growing city. Many High Injury Streets traverse commercial districts that will benefit economically from safer, more inviting streets.

Greening and green stormwater infrastructure will be included in corridor projects when feasible and cost effective. Examples include in pedestrian safety islands and intersection medians. This is in line with City green infrastructure policies and stormwater regulations that protect our water quality and mitigate flooding concerns. This also helps address urban heat island impacts, which are considerable in many areas in this proposal according to regional analysis.

Most City and Public Works employees are union members and the City is committed to providing good-paying jobs with good benefits. The City and Public Works in particular also have a number of programs to support workforce pathways, including programs specifically focused on connecting with historically underrepresented groups.

Supplemental Planning and Demonstration Activities

This proposal builds on the recently updated Minneapolis Vision Zero Action Plan with six supplemental planning activities identified in that plan:

1. SPEED DATA COLLECTION TO INFORM PLANNING AND EVALUATION

Speeding is the number one factor in serious and fatal crashes in Minneapolis and speed management is the most important focus of our Vision Zero Action Plan. The City will get access to robust GPS speed data and augment that with speed data collection across the city to inform speed management-related planning and evaluation work.

2. TRAFFIC SAFETY CAMERA PILOT DEVELOPMENT

Note: the traffic safety camera pilot work in the application was not funded.

Implementing a traffic safety camera pilot for speeding and/or red light running is a key strategy in our Vision Zero Action Plan. Minnesota state law currently does not support traffic safety cameras. The City is actively working to get legislative authority for traffic safety cameras and is hopeful that a policy will pass during the 2024 legislative session after positive discussions in recent years (House File 2098/Senate File 2026 are active bills on this topic). In addition to gaining legislative authority, the City needs to develop the details of a local pilot for traffic safety

cameras. This proposal would fund that work, including community engagement and analysis of legal details, camera technology options to inform contracts, camera locations, budgeting and staffing, and communications needs.

3. SPEED LIMIT CHANGE EVALUATION

The City lowered speed limits on all City-owned streets in 2020. This report will include evaluation of before and after speeds and crashes.

4. QUICK BUILD SAFETY TREATMENT EVALUATION

Minneapolis started a dedicated quick-build safety treatment program in 2020. Since then, quick build safety treatments have been installed at nearly 200 intersections. This evaluation will include before and after crash analysis and speed data analysis.

5. ANALYSIS TO SUPPORT STATE RULE DEVELOPMENT TO BETTER SUPPORT SPEED MANAGEMENT

Existing Minnesota rules limit the ability of cities to install arterial traffic calming measures that include vertical deflection. The City is working to adjust the rules to give all Minnesota communities flexibility to implement more speed management treatments, such as speed cushions or raised crosswalks. This analysis would look at examples from other states to help inform our work to adjust these rules and more effectively support safe speeds.

6. ROUNDABOUT EVALUATION

46% of serious and fatal crashes in Minneapolis happen at signalized intersections. This study will evaluate the potential to include roundabouts at more collector and arterial street intersections to address this challenge. It will include analysis of local considerations, review of best practices and examples that can inform our urban context, and initial technical geometric analysis of potential intersections.

Project readiness

TECHNICAL CAPACITY

Minneapolis is ready to deliver this scope of work within five years of an executed grant agreement and ideally more quickly. Public Works delivered a $185 million 2022 capital program and delivered 12 federal-aid transportation projects totaling more than $33 million in federal funding over the last 4 years. Our Vision Zero Capital Program delivered quick-build safety treatments at 141 intersections in 2022. The City has experienced staff and a robust consulting pool across all aspects of project delivery, including planning, engagement, design, environmental, permitting, approvals, construction, and evaluation.

DESIGN STANDARDS

All planned treatments adhere to state and federal design standards.

SYSTEMWIDE PROJECTS AND SUPPLEMENTAL PLANNING ACTIVITIES

The proposed systemwide projects and supplemental planning activities will start in late 2024 or 2025 pending the final grant contract timing and details. These projects do not require extensive federal approval processes.

CORRIDOR PROJECT DETAILED ACTIVITY SCHEDULE

The City anticipates delivering corridor projects in bundles over 4 years. If awarded the grant, the City would like to discuss with USDOT how they would like projects packaged for the NEPA and approvals process given that this project covers treatments on many different roadways implemented over multiple years. Those details may impact final project timelines.

STEPS FOR CORRIDOR PROJECTS INCLUDE

1) Community engagement, 2) finalizing scope and layout, 3) NEPA and other federal approvals, 4) state and local planning approvals, 4) final design, 5) acquiring temporary construction easements (if needed), 6) contractor procurement, and 7) construction.

The City will program and deliver this project to meet all necessary local, State, and Federal requirements, including: 1) local approvals through required City and County processes as applicable; 2) multi-party agreements with all relevant agencies, including MnDOT, Hennepin County, Metro Transit, and the Minneapolis Park and Recreation Board; 3) any state approvals as identified by the federal aid section of MnDOT Metro State Aid; and 4) environmental documentation that satisfies all National Environmental Policy Act (NEPA) requirements.

If successful, it is anticipated that this project will be entered into the FHWA Transportation Improvement Program (TIP) and the MnDOT State Transportation Improvement Program (STIP). This project may include improvements where historic/archaeological properties are included in the project area, though a determination of no historic properties affected is anticipated. No railroad involvement or right-of-way agreement is anticipated. Most or all work will take place entirely within the public right-of-way. Any permanent or temporary easement needs will be identified in the design phase of the project. Any required or desired utility relocation will be coordinated during the project preliminary design phase. Plan set certification, environmental documentation, project letting, and construction will commence on a timeline consistent with all applicable local, state, and Federal requirements.

The City will provide the required quarterly Performance Progress Report and Federal Financial Report as well as any other required reporting. The City will support any required USDOT evaluation or data collection work and follow all related procedures.

Minneapolis Vision Zero timeline

Key actions related to Vision Zero work in Minneapolis include:

2017	Adopted Vision Zero policy
2017	Expanded safety as a key factor for prioritizing capital street projects
2017	Pedestrian Crash Study
2018	Vision Zero Crash Study
2019	Adopted 2020-2022 Vision Zero Action Plan
2020	Created and funded quick-build safety program focused on High Injury Streets that has installed safety treatments at nearly 200 intersections.
2020	Lowered speed limits citywide to 20 mph on all local streets and 25 mph on most collector and arterial streets
2021	Created a Safe System-focused Street Design Guide to build safety best practices into all our capital projects
2022	Updated and expanded Vision Zero Crash Study
2023	Adopted 2023-2025 Vision Zero Action Plan

Corridor project locations and planned treatments

Corridor project locations

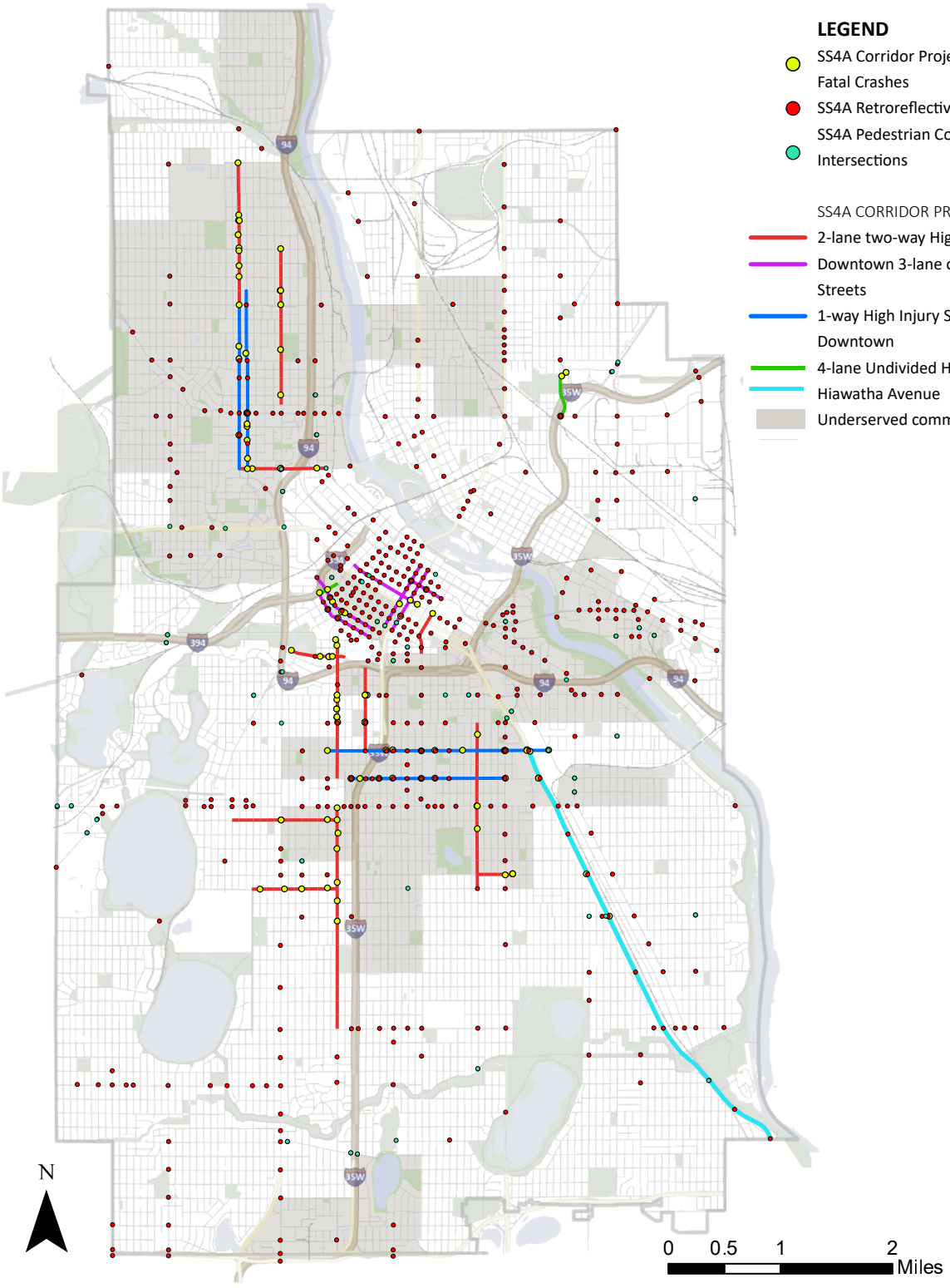


Figure 2: Minneapolis proposal locations by corridor type

Corridor project locations and planned treatments

Planned treatments

This proposal includes five types of corridor projects. This appendix includes details on each corridor included in this proposal.

- 2-lane two-way High Injury Streets
- Downtown 3-lane one-way High Injury Streets
- One-way High Injury Streets outside of downtown
- 4-lane undivided High Injury Streets
- Hiawatha Ave (a High Injury Street that does not bundle with other corridors)

2-LANE TWO-WAY HIGH INJURY STREETS

PROJECT LOCATION	IN UNDERSERVED COMMUNITY (CEJST)	PLANNED TREATMENTS
Lyndale Ave N, 21st Ave N to 36th Ave N	Yes	19 intersection medians or pedestrian safety islands (with ADA ramp upgrades where needed) and street lighting upgrades at 5 intersections
Fremont Ave N, Lowry Ave N to 42nd Ave N	Yes	16 intersection medians or pedestrian safety islands (with ADA ramp upgrades where needed) and street lighting upgrades at 6 intersections
Plymouth Ave N, Fremont Ave N to West River Pkwy	Yes	1 intersection with comprehensive safety rebuild (Plymouth and Lyndale, which has 3 serious injury crashes in last 5 years), protected bike lanes, and 14 protected bikeway medians/ protected bikeway intersection treatments
15th St W, Oak Grove Ave to 1st Ave S	No	Either 6 pedestrian safety islands/ intersection medians or protected bike lanes. Final details informed by future engagement and analysis.
3rd Ave S, 17th St to 25th St	Partially	8 intersection medians or pedestrian safety islands (with ADA ramp upgrades where needed)
Nicollet Ave, Grant St to 28th St	Mostly	13 intersection medians or pedestrian safety islands (with ADA ramp upgrades where needed)
Nicollet Ave, Lake St to 46th St	Partially	33 intersection medians or pedestrian safety islands (with ADA ramp upgrades where needed) and 2 RRFBs
Bloomington Ave, 24th St to 36th St	Yes	20 intersection medians or pedestrian safety islands (with ADA ramp upgrades where needed) and street lighting upgrades at 4 intersections

Corridor project locations and planned treatments

31st St W, Girard Ave to Pleasant Ave	Mostly	13 intersection medians or pedestrian safety islands (with ADA ramp upgrades where needed) and street lighting upgrades at 5 intersections
36th St W, Dupont Ave to Nicollet Ave	No	11 intersection medians or pedestrian safety islands (with ADA ramp upgrades where needed) and street lighting upgrades at 5 intersections and 2 blocks protected bike lanes with 3 protected bikeway medians/ protected bikeway intersection treatments
Chicago Ave at 6th St and 15th St	Yes	1 intersection median and 1 pedestrian safety island
35th St E at Longfellow Ave	Yes	3 pedestrian safety islands and street lighting upgrades at 2 intersections

DOWNTOWN 3-LANE ONE-WAY HIGH INJURY STREETS

PROJECT LOCATION	IN UNDERSERVED COMMUNITY (CEJST)	PLANNED TREATMENTS
1st Ave N to Portland Ave	No	Protected bike lane with 13 intersection bikeway medians/protected bikeway intersection treatments
4th St S, 4th Ave S to Chicago Ave	No	Protected bike lane with 9 intersection bikeway medians/protected bikeway intersection treatments and general 3-to- 2 lane conversion with turn lanes where appropriate[8].
11th St N/S, 3rd Ave S to 12th St	Yes	Protected bike lane with 16 intersection bikeway medians/protected bikeway intersection treatments and general 3-to- 2 lane conversion with turn lanes where appropriate.
12th St N/S, Linden Ave to 3rd Ave S	Yes	Protected bike lane with 16 intersection bikeway medians/protected bikeway intersection treatments and general 3-to- 2 lane conversion with turn lanes where appropriate.
4th Ave S, Washington Ave to 10th St	Partially	Protected bike lane with 16 intersection bikeway medians/protected bikeway intersection treatments and general 3-to- 2 lane conversion with turn lanes where appropriate.
5th Ave S, Washington Ave to 10th St	Partially	Protected bike lane with 16 intersection bikeway medians/protected bikeway intersection treatments and general 3-to- 2 lane conversion with turn lanes where appropriate.

[8] High-level traffic analysis shows that general 3-to-2 lane conversions are very likely feasible on most or all of each corridor. Final traffic analysis as part of forthcoming transit priorities study will determine detailed configurations and whether transit priority lanes will be included on any corridors (any transit priority lanes would be funded separately)

Corridor project locations and planned treatments

DOWNTOWN 3-LANE ONE-WAY HIGH INJURY STREETS (CONT)

Figure 3 shows an example of before/after graphic for Downtown one-way street planned treatments.

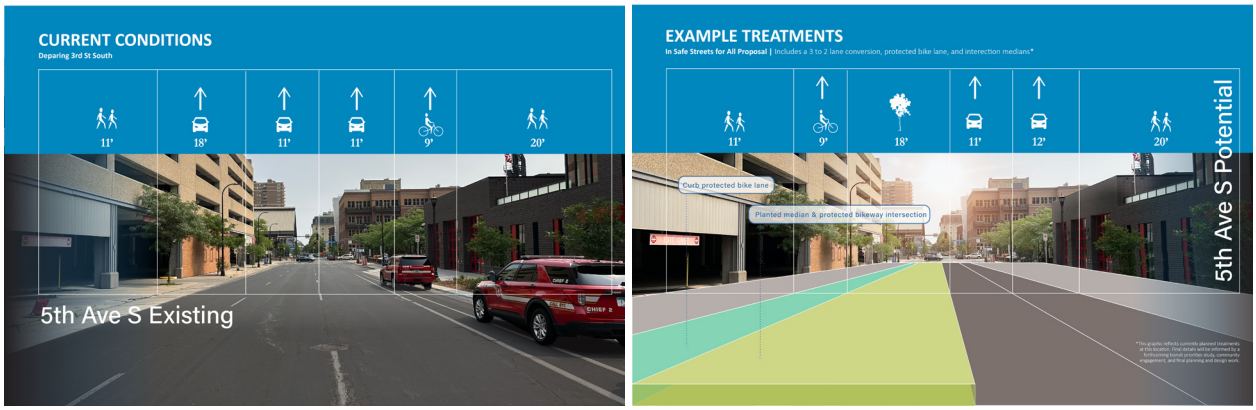


Figure 3: Example of 3 to 2 lane conversion with protected bike lane and bikeway medians

ONE-WAY HIGH INJURY STREETS OUTSIDE OF DOWNTOWN

PROJECT LOCATION	IN UNDERSERVED COMMUNITY (CEJST)	PLANNED TREATMENTS
Fremont Ave N, Plymouth Ave N to Lowry Ave N	Yes	31 pedestrian safety islands adjacent to protected bikeway (with ADA ramp upgrades where needed) and street lighting upgrades at 12 intersections
Emerson Ave N, Plymouth Ave N to 33rd Ave N	Yes	33 pedestrian safety islands adjacent to protected bikeway (with ADA ramp upgrades where needed) and street lighting upgrades at 12 intersections
26th St W/E, Blaisdell Ave to Minnehaha Ave	Yes	1 intersection with comprehensive safety rebuild (26th St and Minnehaha Ave, which has 3 serious injury crashes in last 5 years), 43 protected bikeway medians/ protected bikeway intersection treatments and street lighting upgrades at 10 intersections
28th St E, Stevens Ave to 18th Ave	Yes	E35 protected bikeway medians/ protected bikeway intersection treatments and street lighting upgrades at 11 intersections

Corridor project locations and planned treatments

ONE-WAY HIGH INJURY STREETS OUTSIDE OF DOWNTOWN (CONT)

Figure 4 and Figure 5 show an example of a bikeway/pedestrian safety island with and without greening

Figure 4: Example of a bikeway median/pedestrian safety island with greening

Figure 5: Example of bikeway median/pedestrian safety island without greening

4-LANE UNDIVIDED HIGH INJURY STREETS

PROJECT LOCATION	IN UNDERSERVED COMMUNITY (CEJST)	PLANNED TREATMENTS
Hawthorne Ave N, 9th St to 12th St	Yes	3Lane safety conversion away from 4-lane undivided to include dedicated left-turn lanes. Medians and/or protected bikeway intersection elements added at 7 locations.
Johnson St NE, Broadway Ave to I-35W entrance	No	4-to-3 lane safety conversion with protected bike lanes and 3 bikeway medians/ intersection medians

Corridor project locations and planned treatments

HIAWATHA AVENUE

PROJECT LOCATION	IN UNDERSERVED COMMUNITY (CEJST)	PLANNED TREATMENTS
Hiawatha Ave, 26th St to 54th St	Partially	Safety-focused coordinated signal timing

Background information on planned treatments

Crash reduction information, cost estimates, and local notes on the planned treatments in this proposal

This appendix includes crash reduction information, cost estimates, and local notes on the planned treatments in this proposal:

- Intersection medians/islands
- Protected bike lanes
- Intersection lighting upgrades
- Lane safety conversions (road diets)
- High visibility marked crosswalks
- Rectangular rapid flashing beacons (RRFBs)
- Safety-focused signal operations for a complex High Injury Street
- Retroreflective backplates
- Pedestrian countdown timers
- Mobile speed trailer program
- In-street pedestrian crosswalk sign program

INTERSECTION MEDIANS/ISLANDS

- These include pedestrian safety islands at unsignalized intersections, center medians at signalized intersections, and bikeway median islands adjacent to protected bike lanes at intersections.
- **Expected safety benefit:** 46%-56% reduction in pedestrian crashes (FHWA), 15% reduction in vehicle crashes (FHWA), and reduced vehicle speeds (FHWA)
- **Total cost estimate:** $16k-$44k per side of an intersection (plus $28k-$57k if ADA ramp upgrades are needed)
- Local notes: Given their cost effectiveness, intersection medians/islands are central to this proposal. In case where there is a protected bike lane, the island will also help protect the bike lane and support protected bicycle intersection design elements. Cost estimates reflect a lower cost installation method that Minneapolis began using recently. Highly deficient ADA curb ramps will be upgraded at locations where these are installed.

PROTECTED BIKE LANES

- **Expected safety benefit:** 59% reduction in vehicle-bike crashes (CMF Clearinghouse)
- **Total cost estimate:** $440k-$490k per mile
- Local notes: This proposal includes curb protected bike lanes (versus lower-cost flexible delineators) at locations where a curb is important for safety and access due to regular vehicle obstructions. The City uses a cost-efficient form-in-place installation method.

INTERSECTION STREET LIGHTING UPGRADES

- **Expected safety benefit:** 33%-38% reduction in nighttime intersection crashes (FHWA)
- **Total cost estimate:** $37k-$68k per intersection
- Local notes: Some intersections along High Injury Streets have older lighting that is less uniformly bright than current City street lighting policies. This proposal includes upgrading lighting when needed along project corridors.

Background information on planned treatments

LANE SAFETY CONVERSIONS (ROAD DIETS)

- These include 4-to-3 lane conversions and 3-to-2 lane one-way street conversions.
- **Expected safety benefit:** 19%-47% reduction in total crashes (FHWA)
- **Total cost estimate:** $80k-$150k per mile
- Local notes: Most 4-lane undivided streets in Minneapolis have been converted to safer configurations in recent years or are planned to be in the next two years. There are two 4-lane undivided streets in this proposal, which will be converted to 3-lane sections with dedicated left-turn lanes. 3-lane streets included in this proposal will generally be converted to 2 lanes with turn lanes where appropriate pending final traffic analysis as part of forthcoming transit priorities study.

HIGH VISIBILITY MARKED CROSSWALKS

- **Expected safety benefit:** Up to 40% reduction in pedestrian injury crashes (FHWA)
- **Total cost estimate:** $2k-$3.5k per intersection leg
- Local notes: The City is finalizing updated procedures for marked crosswalks to support Vision Zero and Complete Streets policies. High visibility durable marked crosswalks will be included at all corridor project locations in this proposal that align with these procedures. The City uses high-visibility Zebra crosswalks and already have marked crosswalks at all signalized intersections.

RECTANGULAR RAPID FLASHING BEACONS (RRFB'S)

- **Expected safety benefit:** 47% reduction in pedestrian crashes (FHWA)
- **Total cost estimate:** $120k-$160k per location
- Local notes: RRFBS are higher cost compared to most other treatments in this proposal, so they are planned only for higher pedestrian crossing demand locations on 2-lane two-way streets with more than 9,000 ADT.

SAFETY-FOCUSED SIGNAL OPERATIONS CHANGES FOR A COMPLEX HIGH INJURY STREET

- **Expected safety benefit:** 21% reduction in crashes (CMF Clearinghouse)
- **Total cost estimate:** $120k total
- Local notes: This proposal includes safety-focused coordinated signal timing for a complex High Injury Street (Hiawatha Avenue/Highway 55).

RETROREFLECTIVE BACKPLATES

- **Expected safety benefit:** 15% reduction in total crashes (FHWA)
- **Total cost estimate:** $1k-$3k per signal
- Local notes: This proposal includes installing retroreflective backplates at all 512 signals citywide that do not currently have them and are not already planned for signal upgrade. The City uses reflective tape as an effective low-cost installation method.

Background information on planned treatments

PEDESTRIAN COUNTDOWN TIMERS

- **Expected safety benefit:** 55% reduction in pedestrian crashes (CMF Clearinghouse)
- **Total cost estimate:** $1k-$1.5k per signal head
- Local notes: Most signals on High Injury Street already have pedestrian countdown timers. This proposal adds pedestrian countdown timers at 49 signalized High Injury Street or Pedestrian Priority Network intersections that do not currently have them and are not already planned for a signal upgrade.

MOBILE SPEED TRAILER PROGRAM

- **Expected safety benefit:** Speed reduction from feedback signs (FHWA)
- **Total cost estimate:** $25k per year for 4 years
- Local notes: This proposal expands strategic deployment of speed feedback signs to reinforce newer speed limits and new speed control measures. It will focus on High Injury Streets.

IN-STREET PEDESTRIAN CROSSWALK SIGN PROGRAM

- **Expected safety benefit:** up to 25% reduction in pedestrian crashes (FHWA)
- **Total cost estimate:** $40k per year for 4 years
- Local notes: A recent study by the University of Minnesota (not yet published) found that Minneapolis drivers generally do not understand that it is state law to stop for pedestrians in crosswalks, which contributes to low rates of stopping for pedestrians in crosswalks. This proposal includes a program to buy and manage in-street “State law: stop for pedestrians in crosswalk” (R1-6) signs to support other pedestrian crossing treatments in this proposal.