

Highway Safety Improvement Program (HSIP) (For State Fiscal Years 2022 and 2023)



Photo Credit: Google, September 2017

Applicant: Hennepin County

Project Name: CSAH 3 (Lake Street) and CSAH 42 (42nd Street) Pedestrian Crossing Safety Improvements

Project Locations:

- **CSAH 3 (Lake Street) at CSAH 152 (Cedar Avenue)**
- **CSAH 42 (42nd Street) at CSAH 152 (Cedar Avenue)**
- **CSAH 42 (42nd Street) at 21st Avenue**
- **CSAH 42 (42nd Street) at 26th Avenue**
- **CSAH 42 (42nd Street) at Nokomis Avenue**

HSIP application (Form 1)

Federal HSIP Funding Application (Form 1)

INSTRUCTIONS: Complete and return completed application to Lars Impola, MnDOT, Metro District, 1500 West County Road B2, Roseville, Minnesota 55113. (651) 234-7820. **Applications must be received by 4:30 PM or postmarked on August 31, 2018...*Be sure to complete and attach the Project Information form. (Form 2)**

I. GENERAL INFORMATION

1. APPLICANT: Hennepin County

2. JURISDICTIONAL AGENCY (IF DIFFERENT):

3. MAILING ADDRESS: 1600 Prairie Drive

CITY: Medina

STATE: MN

ZIP CODE: 55340

4. COUNTY: Hennepin

5. CONTACT PERSON: Chad Ellos

TITLE: Transportation Planning Division Manager

PHONE NO. (612)-596-0395

CONTACT E-MAIL ADDRESS: chad.ellos@hennepin.us

II. PROJECT INFORMATION

6. PROJECT NAME: CSAH 3 (Lake Street) and CSAH 42 (42nd Street) Pedestrian Crossing Safety Improvements

7. BRIEF PROJECT DESCRIPTION - Include location, road name, type of improvement, etc... (A complete description can be submitted separately): The following safety improvements are proposed at various intersections along Lake Street and 42nd Street whenever feasible and warranted: curb extensions, raised medians, crossing beacons, ADA accommodations, pavement markings, and signage.

8. HSIP PROJECT CATEGORY – Circle which project grouping in which you wish your project to be scored.

Proactive

Reactive

III. PROJECT FUNDING

9. Are you applying or have you applied for funds from another source(s) to implement this project?
Yes No If yes, please identify the source(s):

10. FEDERAL AMOUNT: \$828,000

13. MATCH % OF PROJECT TOTAL: 10%

11. MATCH AMOUNT: \$92,000

14. SOURCE OF MATCH FUNDS: Hennepin County

12. PROJECT TOTAL: \$920,000

15. REQUESTED PROGRAM YEAR(S) : SEE NOTE BELOW

2022 2023 Either year

16. SIGNATURE: 

17. TITLE: Transportation Planning Division Manager

***NOTE:** If funding should become available in 2019, 2020, or 2021, would this project be able to be advanced to meet this schedule? No

Project information sheet (Form 2)

PROJECT INFORMATION (Form 2)

(To be used to assign State Project Number after project is selected)

Please fill in the following information as it pertains to your proposed project. Items that do not apply to your project, please label N/A. **Do not send this form to the State Aid Office. For project solicitation package only.**

COUNTY, CITY, or LEAD AGENCY: HENNEPIN COUNTY

FUNCTIONAL CLASS OF ROAD: CSAH 3 – A-Minor Arterial (Augmentor)
CSAH 42 – A-Minor Arterial (Augmentor)

ROAD SYSTEM: CSAH (TH, CSAH, MSAS, CO. RD., TWP. RD., CITY STREET)

NAME OF ROAD: Cedar (CSAH 152), Lake Street (CSAH 3, 42nd Street (CSAH 42)

(Example: 1st Street, Main Avenue)

ZIP CODE WHERE MAJORITY OF WORK IS BEING PERFORMED: 55407

APPROXIMATE BEGIN CONSTRUCTION DATE (MO/YR): April/2022

APPROXIMATE END CONSTRUCTION DATE (MO/YR): December/2022

LOCATION: CSAH 3 (Lake Street) at CSAH 152 (Cedar Avenue), CSAH 42 (42nd Street) at CSAH 152 (Cedar Avenue), CSAH 42 (42nd Street) at 21st Avenue, CSAH 42 (42nd Street) at 26th Avenue, CSAH 42 (42nd Street) at Nokomis Avenue in the City of Minneapolis in Hennepin County.

(DO NOT INCLUDE LEGAL DESCRIPTION)

TYPE OF WORK: MEDIANS, CURB EXTENSIONS, PAVEMENT MARKINGS, SIGNALS, SIGNS, LIGHTING, CROSSING AIDES

(Examples: GRADE, AGG BASE, BIT BASE, BIT SURF, SIDEWALK, CURB AND GUTTER, STORM SEWER, SIGNALS, LIGHTING, GUARDRAIL, BIKE PATH, PED RAMPS, BRIDGE, PARK AND RIDE, ETC)

Highway Safety Improvement Program (HSIP)

Project Name

CSAH 3 (Lake Street) and CSAH 42 (42nd Street) Pedestrian Safety Improvements

Project Location

Five intersections throughout South Minneapolis in Hennepin County, MN

- CSAH 3 (Lake Street) and CSAH 152 (Cedar Avenue)
- CSAH 42 (42nd Street) and 21st Avenue
- CSAH 42 (42nd Street) and 26th Avenue
- CSAH 42 (42nd Street) and CSAH 152 (Cedar Avenue)
- CSAH 42 (42nd Street) and Nokomis Avenue

Brief Project Description

Hennepin County is proposing pedestrian-specific safety improvements (e.g. raised medians, curb extensions, crossing beacons, pavement markings, ADA upgrades) at various intersections (whenever feasible and warranted) in the City of Minneapolis as identified above (see Attachment A).

CSAH 3 (Lake Street) is a four-lane undivided roadway that serves approximately 19,400 vehicles daily. This section of roadway was reconstructed in the 2000s which introduced curb extensions at many of the intersections to better define on-street parking areas and reduce the pedestrian crossing distance. However, a curb extension was not installed in the southwest quadrant at the CSAH 3 (Lake Street) and CSAH 152 (Cedar Avenue) for reasons unknown. The land use near the CSAH 3 (Lake Street) and CSAH 152 (Cedar Avenue) intersection is primarily commercial, and thus, generates routine pedestrian crossing activity to access these destinations.

CSAH 42 (42nd Street) is a two-lane undivided roadway that serves approximately 8,500 vehicles daily. This project proposes pedestrian crossing improvements at various intersections along a one-mile segment between CSAH 152 (Cedar Avenue) and Nokomis Avenue that includes two signalized intersections to offer protected pedestrian crossings. Northrop Elementary School and Roosevelt High School are located near the project area which generate routine pedestrian crossing activity (especially children) along CSAH 42 (42nd Street).

The following is a summary of the general roadway characteristics associated with the intersections include:

- Urban roadways ranging from two to four lanes of vehicle through traffic lanes
- On-street parking
- On-road bicycle accommodations (bike boulevards, shared lanes, and bike lanes)
- Transit stops
- Diverse traffic control devices (side street stops, all-way stops, and traffic signals)
- Residential and commercial land uses

The following safety improvements (whenever feasible and warranted) are proposed as part of this application at existing signalized intersections (see Attachment B):

- Curb extensions to reduce the pedestrian crossing distance and provide traffic calming
- Lighting upgrades to improve nighttime visibility
- ADA upgrades (including pedestrian ramps and APS) to provide adequate accessibility

The following safety improvements (whenever feasible and warranted) are proposed as part of this application at existing non-signalized intersections: (see Attachment B):

- Raised medians to provide a pedestrian refuge and traffic calming
- Curb extensions to reduce the pedestrian crossing distance and provide traffic calming
- Revised pavement markings to better guide vehicles
- ADA upgrades (including pedestrian ramps) to provide adequate visibility
- Pedestrian crossing beacons to improve visibility

The proposed safety improvements at these intersections are consistent with those identified in the County's Roadway Safety Plan (CRSP) (see Attachment C) and are consistent with the strategies identified in the County's Roadway Safety Plan Big Book of Ideas (see Attachment C). Furthermore, the intersections were identified in the City of Minneapolis Pedestrian Crash Study as "High Pedestrian Crash Intersections" and being located along "Pedestrian Crash Concentration Corridors" (see Attachment C)". This is due to the high volume of traffic that these roadways carry, both for motor vehicles and bicycles/pedestrians. The City of Minneapolis Pedestrian Crash Study also identified the intersection of CSAH 3 (Lake Street) and CSAH 152 (Cedar Avenue) as an intersection where a high volume of pedestrian crashed occurred. The study also identified curb extensions as a potential mitigation measure to improve pedestrian safety at intersections (see Attachment C). The Northrop Elementary Safe Routes to School Study identified CSAH 42 (42nd Street) as a major barrier for students traveling to and from school due the high volumes and speeds along the corridor. This study also identified the intersections of CSAH 42 (42nd Street) and 21st Avenue, CSAH 42 (42nd Street) and 26th Avenue, and CSAH 42 (42nd Street) and Nokomis Avenue as potential opportunities for pedestrian safety improvements (see Attachment C).

Hennepin County will be coordinating with the City of Minneapolis and Metro Transit throughout this project (see Attachment D for letters of Support). This project will comply with state aid design standards and Americans with Disabilities Act (ADA) standards.

Crash Summary

The major safety issues that occur at these intersections involve vehicles colliding with bicyclists and pedestrians after having failed to yield at crosswalks and disregarding traffic signals. Between 2006 and 2015, there were a total of 333 vehicular crashes reported at project location intersections in Minneapolis; 29 of these crashes involved bicycles and pedestrians. This data was provided by MnDOT staff using the Minnesota Department of Public Safety Data Base (see Attachment E). The following is a summary of the crashes reported. Additionally, collision diagrams for the intersections are included in Attachment F.

Severity Type

Key findings from this summary include:

- 32 out of 88 of the vehicular-only crashes at CSAH 42 (42nd Street) and CSAH 152 (Cedar Avenue) were injury type crashes including one incapacitating injury, six non-incapacitating injury and 25 possible injury (see Figure 1).
- 75 out of 222 of the vehicular-only crashes at CSAH 3 (Lake Street) and CSAH 152 (Cedar Avenue) were injury type crashes including four incapacitating injury, 16 non-incapacitating injury and 54 possible injury. **One fatality** was recorded at this intersection (see Figure 2).
- For all of the intersections combined, there were a total of 29 crashes involving bicycles and/or pedestrians. Twenty-seven out of 29 of the crashes were injury type crashes including **one fatality**, four incapacitating injury, nine non-incapacitating injury, and 13 possible injury (see Figure 3).

Figures 1 through 3 provide a summary of two of the five of the intersections' vehicle-only crash data, as well as all bicycle and pedestrian crashes, by severity type.

FIGURE 1: CRASHES BY SEVERITY (CSAH 42 (42ND STREET) AND CSAH 152 (CEDAR AVENUE))

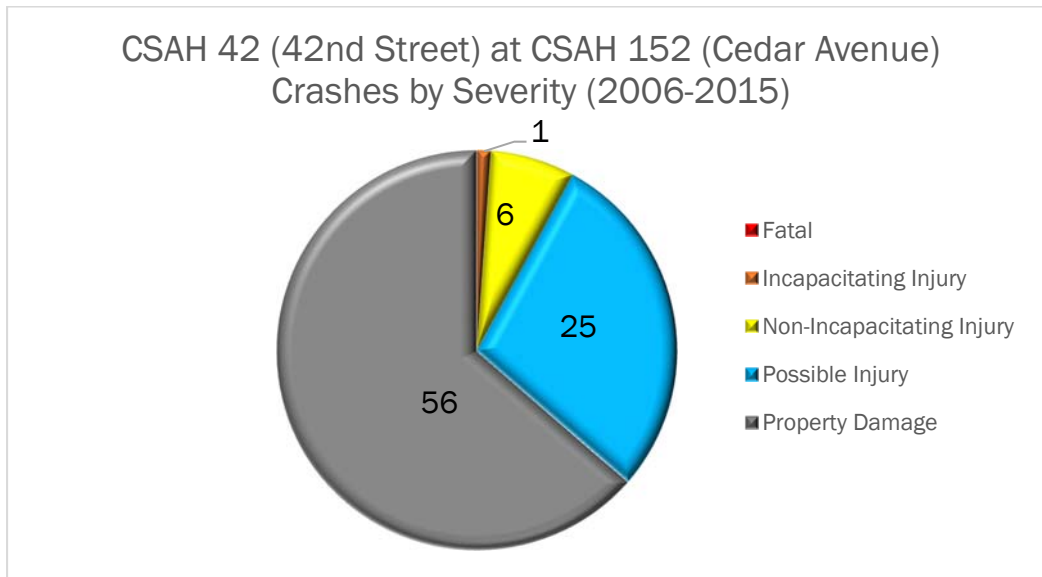


FIGURE 2: CRASHES BY SEVERITY (CSAH 3 (LAKE STREET) AND CSAH 152 (CEDAR AVENUE))

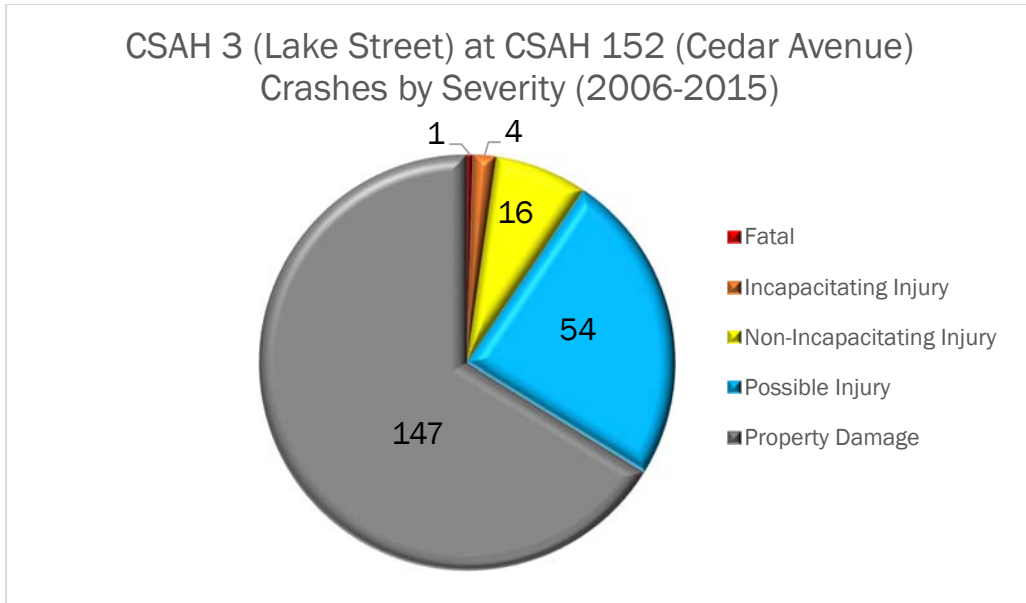
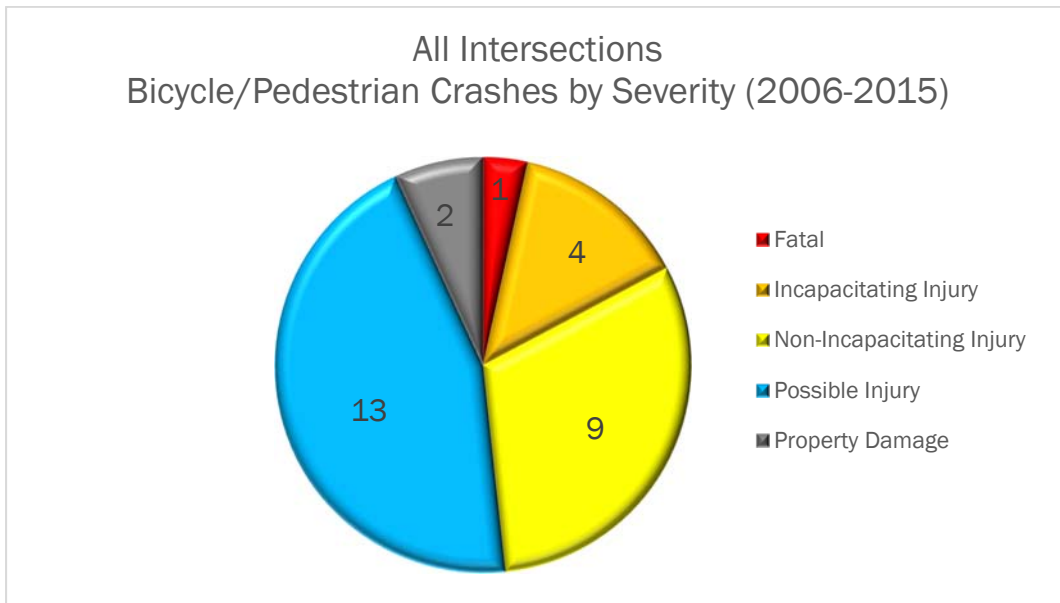


FIGURE 3: BICYCLE/PEDESTRIAN CRASHES BY SEVERITY (ALL INTERSECTIONS)



Crash Type

Figure 4 provides a summary of two of the five intersections' crash data by type. Key findings from this summary include:

- Right angle and rear end crashes represented over 50 percent of crashes at CSAH 42 (42nd Street) and CSAH 152 (Cedar Avenue) as well as at CSAH 42 (42nd Street) and CSAH 3 (Lake Street) (see Figures 4 and 5).

- For bicycle and pedestrian related crashes, many of the 29 crashes were caused by vehicles failing to yield at crosswalks, vehicles disregarding traffic devices, and bicycle collisions with pedestrians.

FIGURE 4: CRASHES BY TYPE (CSAH 42 (42ND STREET) AND CSAH 152 (CEDAR AVENUE))

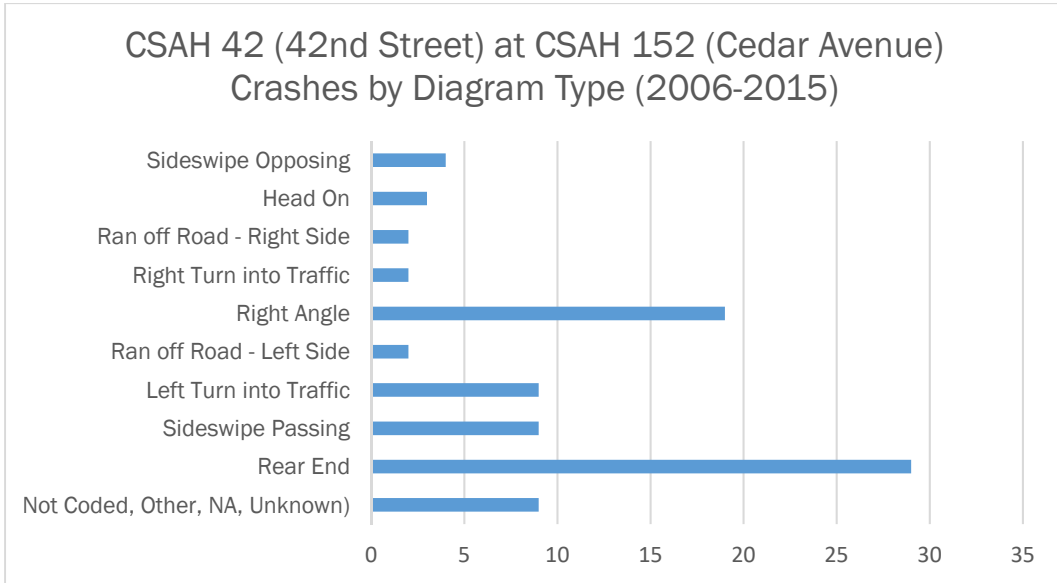
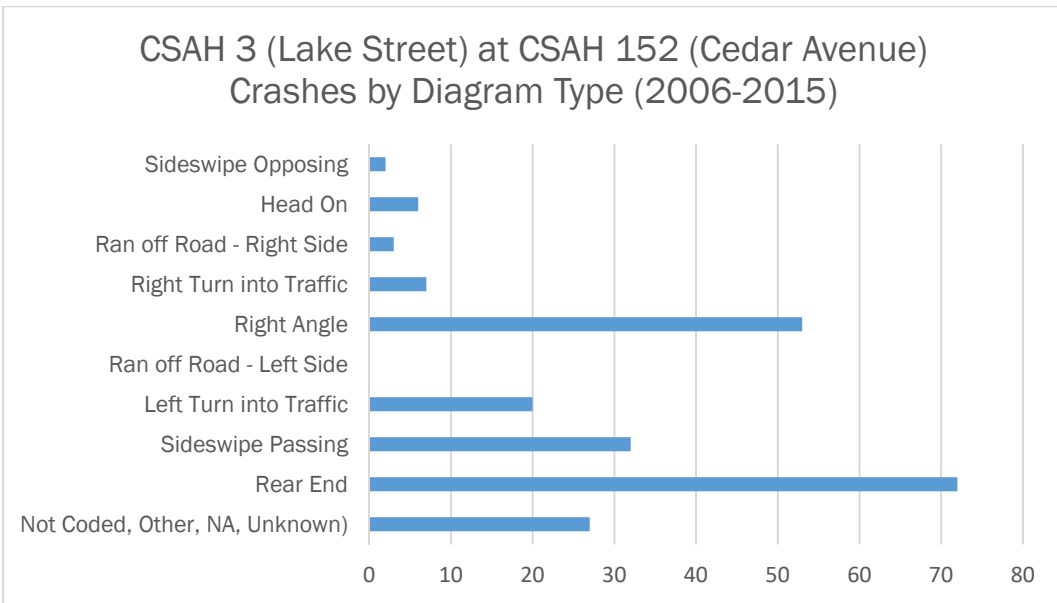


FIGURE 5: CRASHES BY TYPE (CSAH 3 (LAKE STREET) AND CSAH 152 (CEDAR AVENUE))



Crash Reduction Factor (CRF)

The Desktop Reference for Crash Reduction Factors (Federal Highway Administration Report No. FHWA-SA-08-011) and the Federal Highway's Crash Modification Factors (CMF) Clearinghouse were used to identify appropriate CRFs for the intersection safety improvements (see Attachment G).

The following safety improvements (whenever feasible and warranted) are being proposed as part of this application at existing signalized intersections: (see Attachment B):

- Installation of accessible pedestrian signals (APS).
- Installation of curb extensions, accompanied with updated pedestrian crossing markings, to reduce crossing distances and provide a physical barrier from vehicles making turns.
- Upgrading of existing lighting (to LEDs)
- Upgrading of pedestrian ramps to meet current ADA design standards

The following CRFs were used to determine the project's benefits at the intersections of (see Attachment G):

- CSAH 3 (Lake Street) and CSAH 152 (Cedar Avenue)
- CSAH 42 (42nd Street) and CSAH 152 (Cedar Avenue)

CRF1 = Curb Extensions = 0.37 for all crash types

Findings: There were 310 crashes at both of these intersections, 26 of these were a bike or ped crash. As shown above, there is a 37 percent reduction (**approximately 115 crashes**) benefit in all crash types for installing curb extensions at these intersections.

The following safety improvements (whenever feasible and warranted) are being proposed as part of this application at existing non-signalized intersections (see Attachment B):

- Raised medians to provide a pedestrian refuge and traffic calming
- Revised pavement markings to better guide vehicles
- ADA upgrades (including pedestrian ramps) to provide adequate visibility
- Pedestrian crossing beacons to improve visibility

The following CRFs were used to determine the project's benefits at the intersections of (see Attachment G):

- CSAH 42 (42nd Street) and 21st Avenue
- CSAH 42 (42nd Street) and 26th Avenue
- CSAH 42 (42nd Street) and Nokomis Avenue

CRF1 = Install refuge islands = 0.56 for pedestrian crashes

Findings: 3 of the crashes at the intersections were "pedestrian" type crashes. As shown above, there is a 56 percent reduction (**approximately 2 crashes**) benefit for installing refuge islands at the intersections.

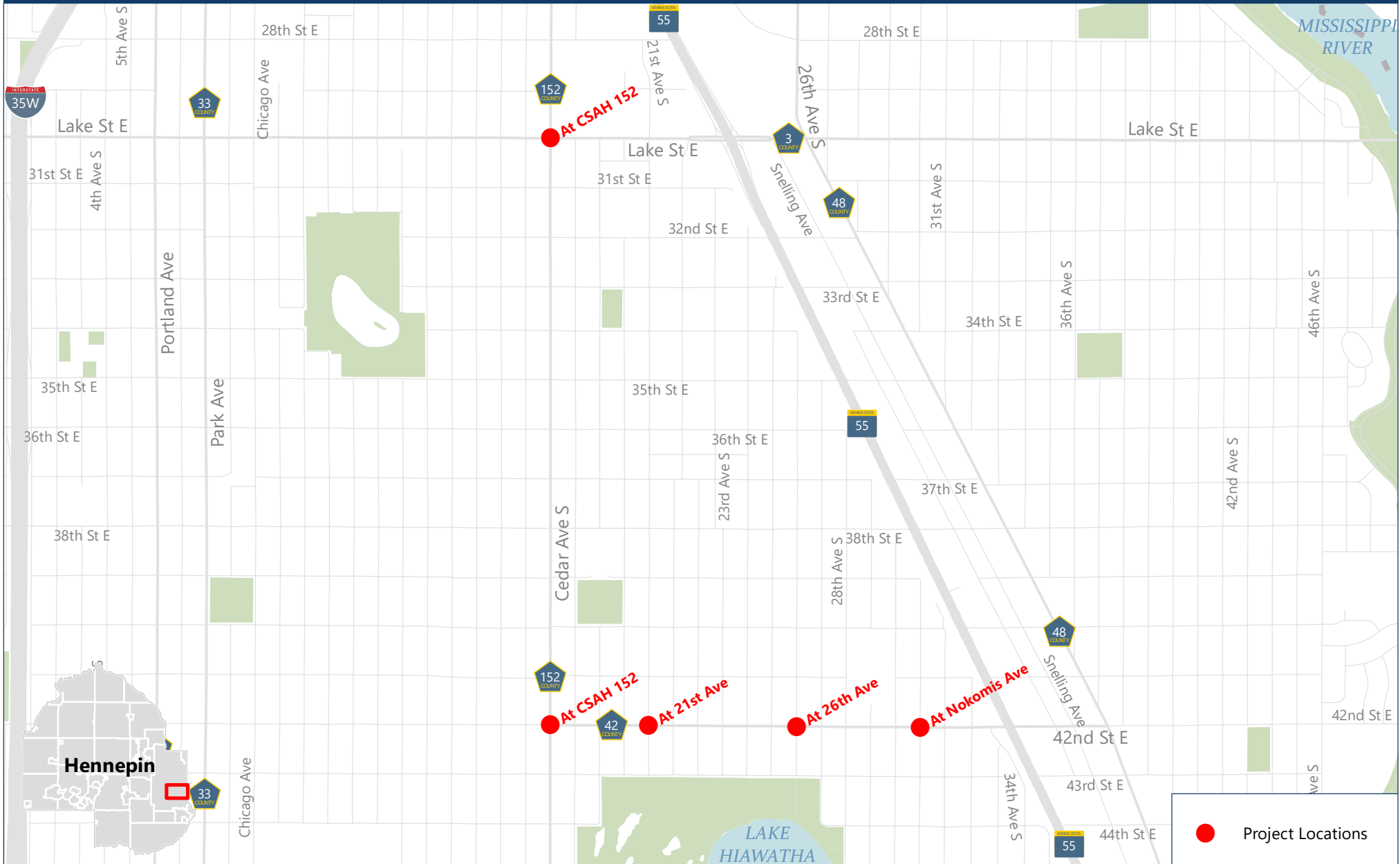
Overall the safety improvements being proposed have the potential to mitigate 117 crashes, including 11 bike or pedestrian related crashes.

Attachment A – Project Location Map

2018 HSIP | Project Location Map

CSAH 3 (Lake St) and CSAH 42 (42nd St) Pedestrian Crossing Safety Improvements

HENNEPIN COUNTY
MINNESOTA



● Project Locations

Disclaimer: This map (i) is furnished "AS IS" with no representation as to completeness or accuracy; (ii) is furnished with no warranty of any kind; and (iii) is not suitable for legal, engineering or surveying purposes. Hennepin County shall not be liable for any damage, injury or loss resulting from this map.

Publication date: 8/23/2018

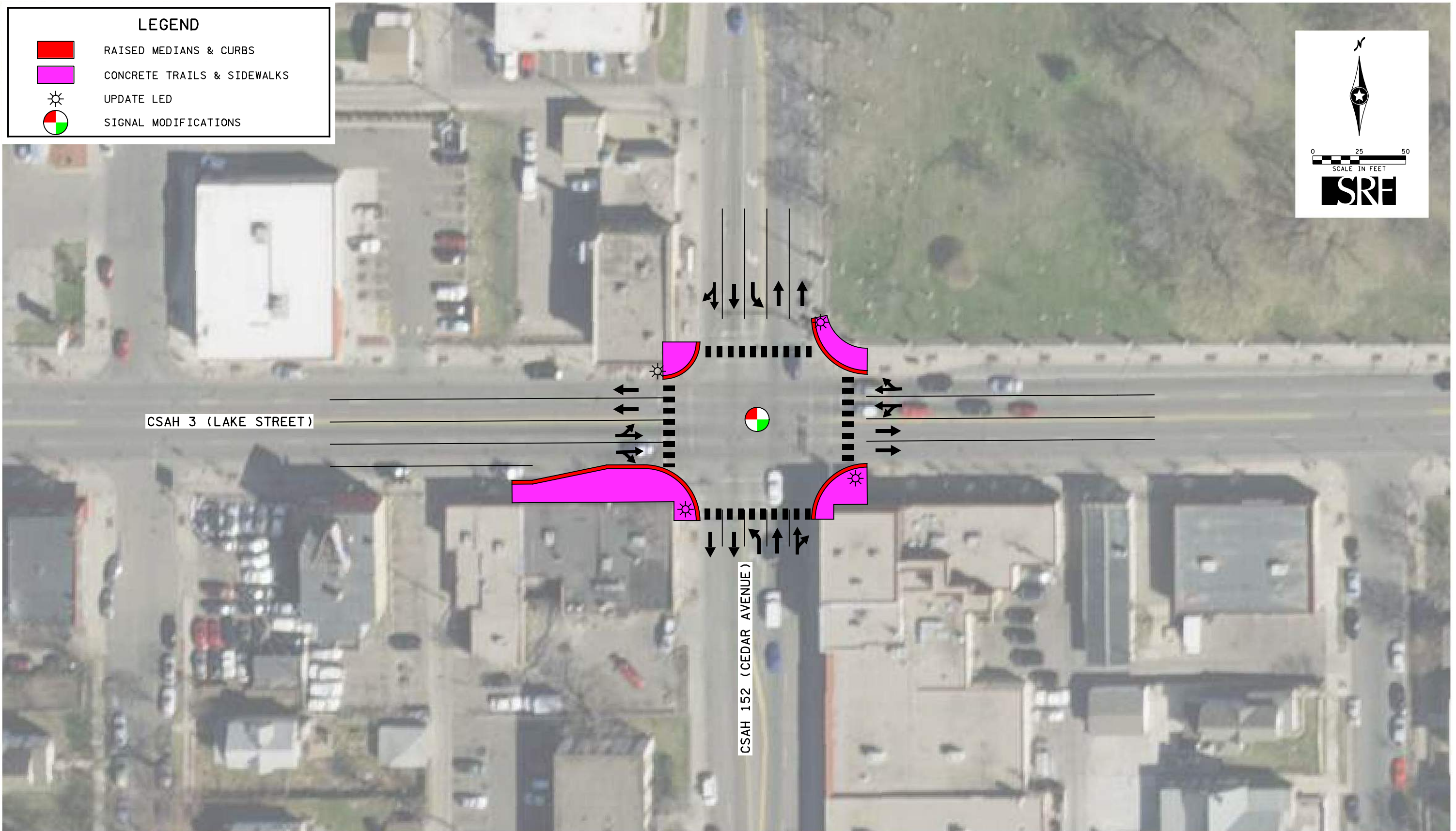


Attachment B – Project Layout and Estimate of Project Costs

LEGEND

- RAISED MEDIANS & CURBS
- CONCRETE TRAILS & SIDEWALKS
- ☀ UPDATE LED
- SIGNAL MODIFICATIONS

SCALE IN FEET
SRE



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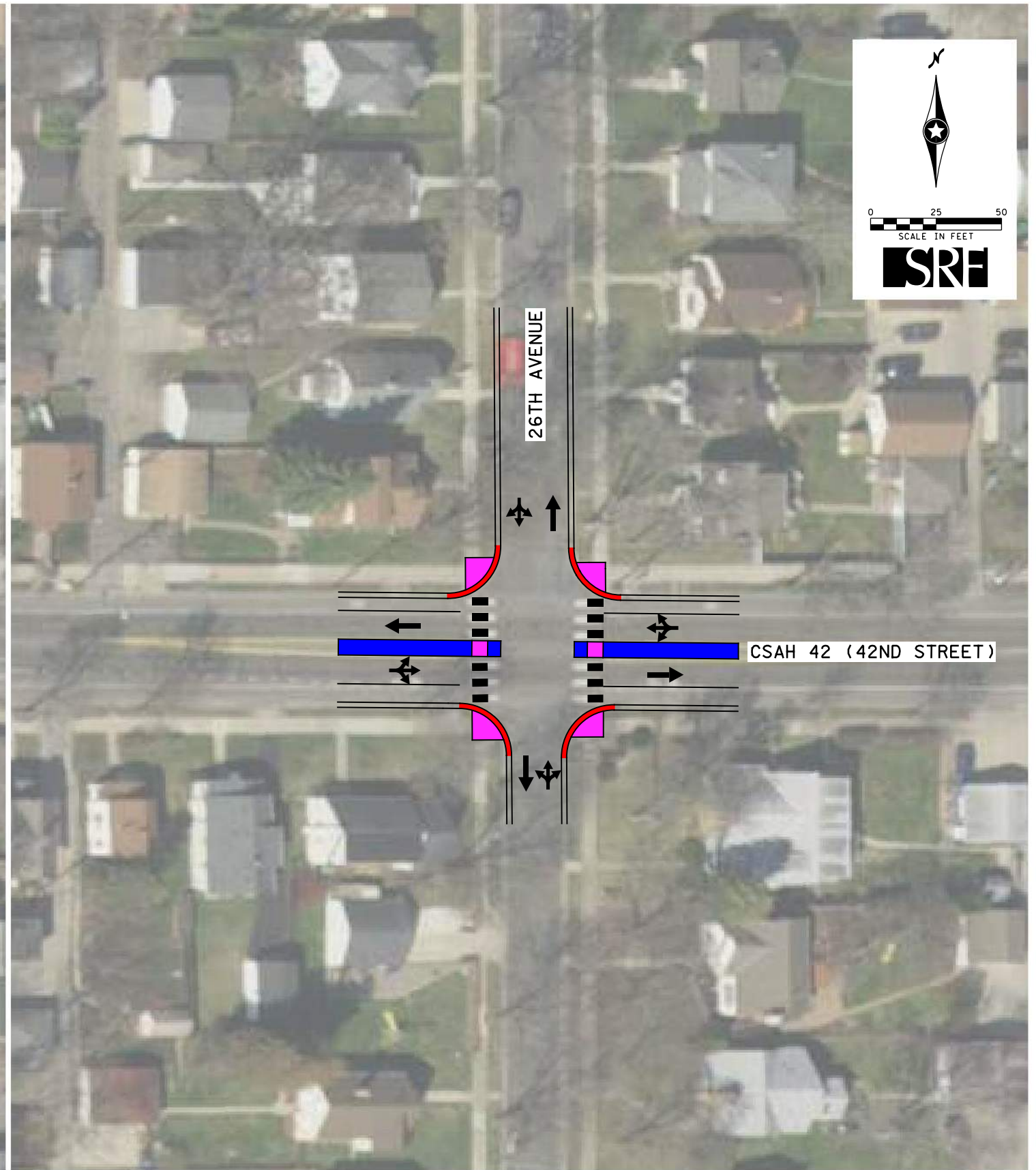
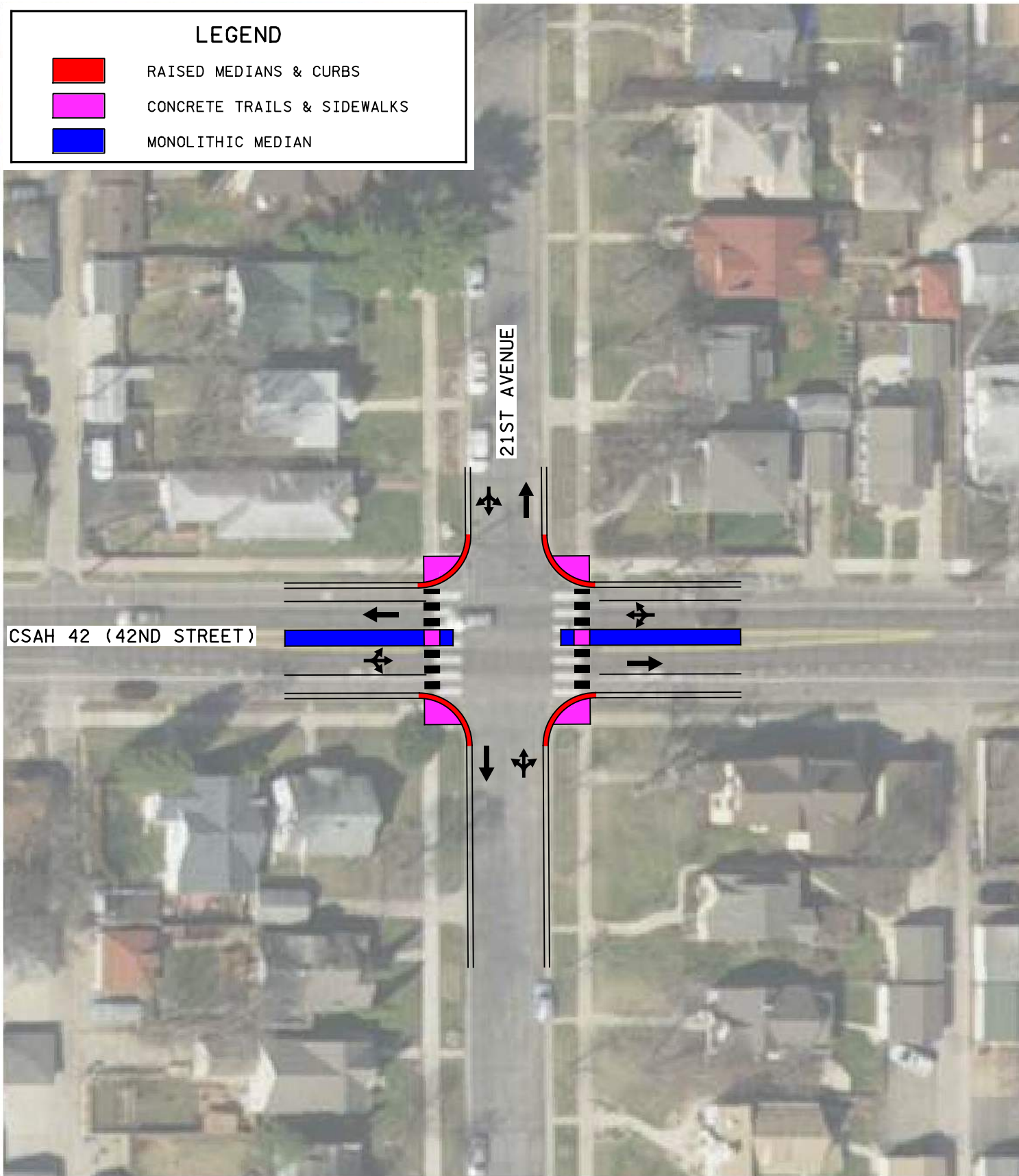
Hennepin County 2018 HSIP

CSAH 3 (Lake Street) & CSAH 152 (Cedar Avenue) Intersection Safety Improvements
Minneapolis, MN

Figure 1

LEGEND

- RAISED MEDIANS & CURBS
- CONCRETE TRAILS & SIDEWALKS
- MONOLITHIC MEDIAN



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Hennepin County 2018 HSIP

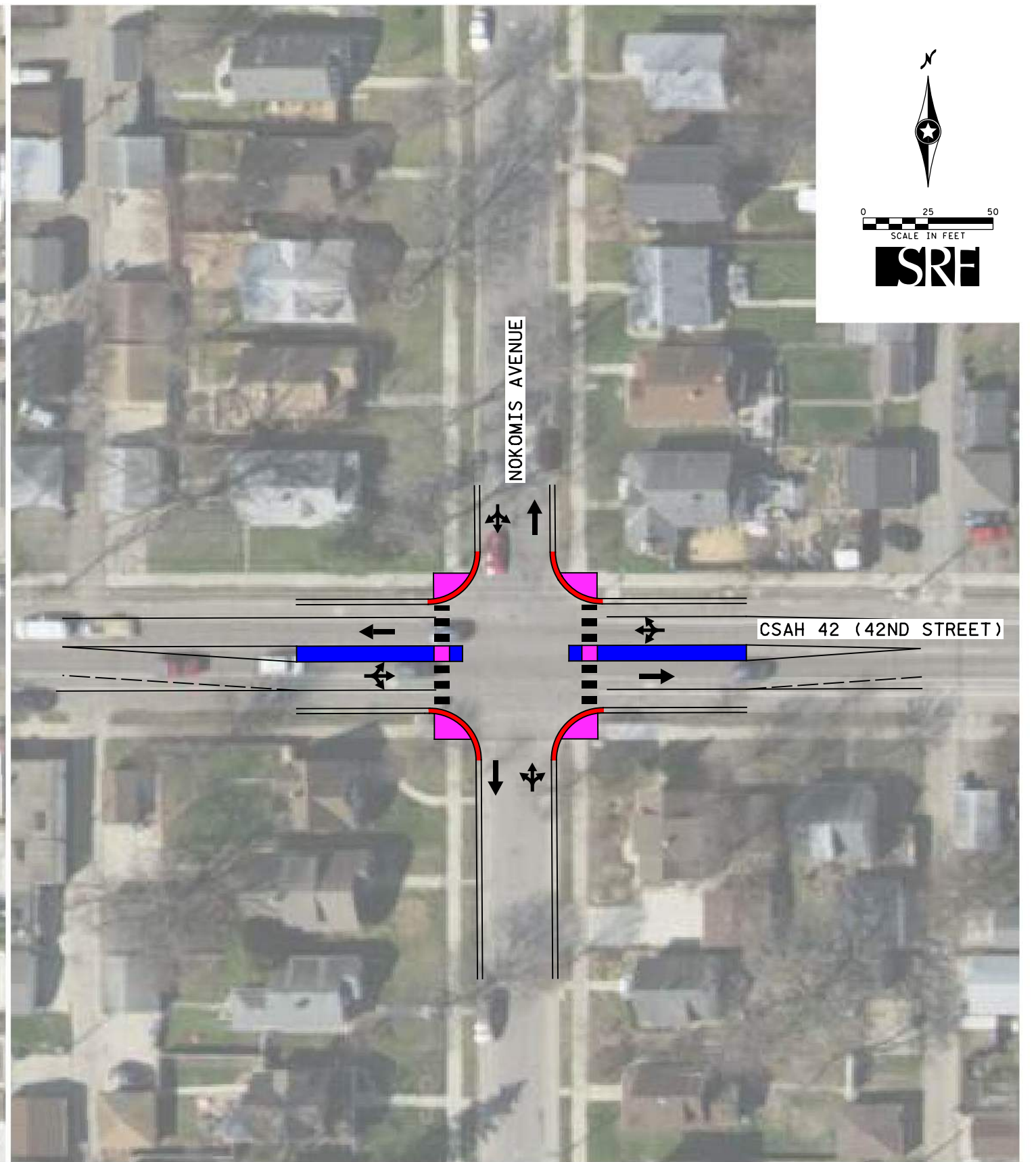
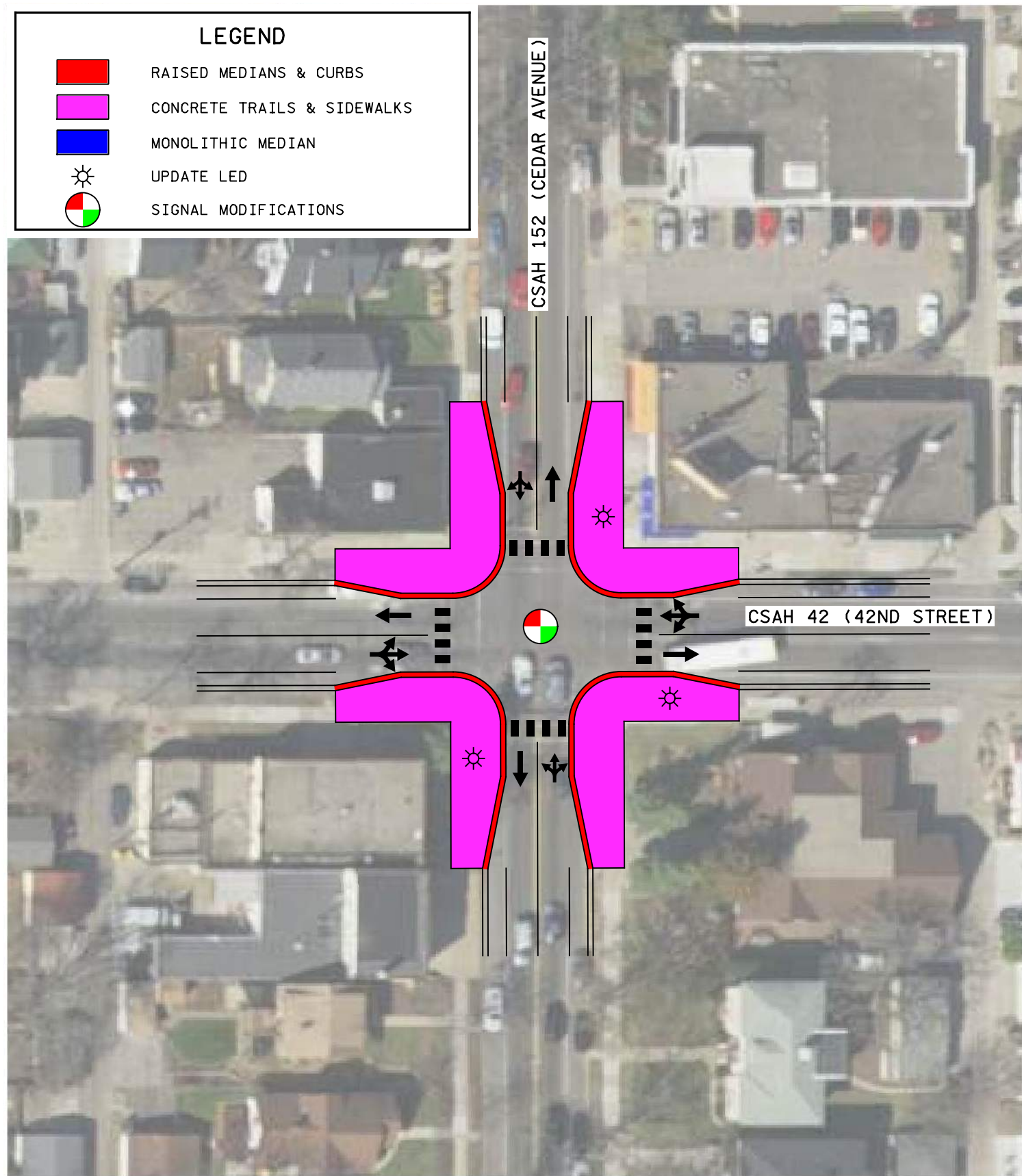
CSAH 42 (42nd Street) & 21st Avenue and CSAH 42 (42nd Street) & 26th Avenue Intersection Safety Improvements
Minneapolis, MN

Figure 2

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LEGEND

- RAISED MEDIANS & CURBS
- CONCRETE TRAILS & SIDEWALKS
- MONOLITHIC MEDIAN
- ☀ UPDATE LED
- 🚦 SIGNAL MODIFICATIONS



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SCALE IN FEET

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Hennepin County 2018 HSIP

CSAH 42 (42nd Street) & CSAH 152 (Cedar Avenue) and CSAH 42 (42nd Street) & Nokomis Avenue Intersection Safety Improvements
Minneapolis, MN

Figure 3



**HENNEPIN COUNTY 2018 HSIP APPLICATION
Minneapolis Pedestrian Crossing Improvements**

Concept Cost Estimate (based upon 2017 bid price information)

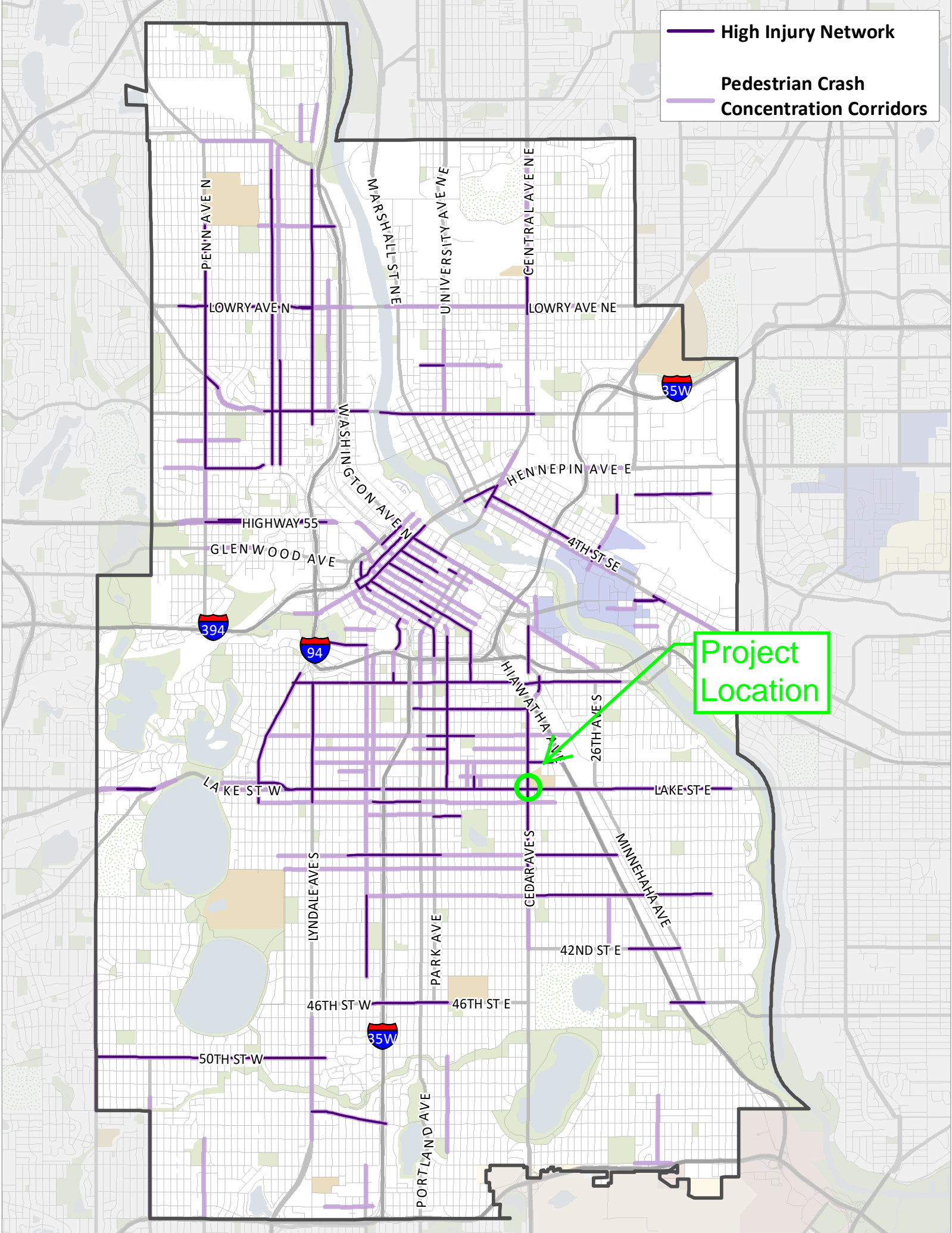
Prepared By: SRF Consulting Group, Inc., 08/14/2018

					CSAH 3 & CSAH 152 CSAH 42 & CSAH 152 CSAH 42 & 21st Avenue CSAH 42 & 26th Avenue CSAH 42 & Nokomis Avenue	
ITEM DESCRIPTION			UNIT	UNIT PRICE	EST. QUANTITY	EST. AMOUNT
PAVING AND GRADING COSTS						
1	Monolithic Median	(1)	sq. vd.	\$65.00	240	\$15,600
2	Concrete Walk / Trail / Median	(1)	sq. vd.	\$50.00	1,275	\$63,750
3	ADA Pedestrian Curb Ramp		each	\$1500.00	40	\$60,000
4	Concrete Curb and Gutter		lin. ft.	\$25.00	1,115	\$27,875
5	Removals - Pavement		sq. vd.	\$10.00	420	\$4,200
SUBTOTAL PAVING AND GRADING COSTS:						\$171,425
DRAINAGE, UTILITIES AND EROSION CONTROL						
1	Drainage - urban		30%			\$52,000
SUBTOTAL DRAINAGE, UTILITIES AND EROSION CONTROL						\$52,000
SIGNAL AND LIGHTING COSTS						
1	Signal Modifications	(2)	each	\$150,000	2	\$300,000
2	Intersection Lighting (LED)		each	\$1,500	7	\$10,500
SUBTOTAL SIGNAL AND LIGHTING COSTS:						\$310,500
SIGNING & STRIPING COSTS						
1	Signing and Striping		Lump Sum	\$8,000	1	\$8,000
SUBTOTAL SIGNING & STRIPING COSTS:						\$8,000
SUBTOTAL CONSTRUCTION COSTS:						\$541,925
MISCELLANEOUS COSTS						
1	Mobilization		10%			\$55,000
2	Non Quantified Minor Items		10%			\$55,000
3	Traffic Control		10%			\$55,000
SUBTOTAL MISCELLANEOUS COSTS:						\$165,000
ESTIMATED TOTAL CONSTRUCTION COSTS without Contingency:						\$706,925
1	Contingency or "risk"		30%			\$213,000
ESTIMATED TOTAL CONSTRUCTION COSTS PLUS CONTINGENCY:						\$919,925
TOTAL PROJECT COST (OPENING YEAR DOLLARS)						\$920,000

(1) Includes aggregate base class 5.
(2) Modifications to existing signal systems at CSAH 3/CSAH 152 and CSAH 42/CSAH 152

Attachment C – Relevant Planning Documents

High Injury Network
Pedestrian Crash Concentration Corridors



Crashes at County Road Intersections

Hennepin County owns and maintains a number of arterials through the City of Minneapolis, such as Lake Street (County Road 3) and Penn Avenue (County Road 2). These streets connect destinations within and outside the City of Minneapolis, and as such are some of the highest volume arterial streets in the City of Minneapolis for both pedestrians and other modes. The intersections on county roads with the most pedestrian crashes are shown in **Table C-5** and intersections with the highest crash rates are shown in **Table C-6**.

Table C-5. County Intersections with Highest Pedestrian Crash Totals

Rank	Street On	Cross Street	Total Pedestrian Crashes	Crash Rate Crashes per Million Entering Vehicles per Year	Entering Vehicle Volume (Vehicles/Day)
1	Lake St W	Lyndale Ave S	24	0.17	37,950
2	West Broadway Ave N	Lyndale Ave N	23	0.23	28,000
3	Franklin Ave W	Nicollet Ave S	21	0.18	31,600
4	Lake St W	Hennepin Ave S	20	0.21	26,300
5	Lake St W	Pillsbury Ave S	17	0.18	25,400
6	Lake St W	Blaisdell Ave S	17	0.18	26,500
7	4th St S	Cedar Ave S	16	0.22	19,650
8	Franklin Ave E	Chicago Ave S	16	0.17	25,150
9	Franklin Ave E	Portland Ave S	16	0.14	30,350
10	26th St W	Lyndale Ave S	15	0.14	29,700
11	Lake St E	Bloomington Ave S	13	0.12	30,500
12	Lake St E	1st Ave S	11	0.12	24,900
13	Franklin Ave E	3rd Ave S	11	0.12	25,675
14	Lowry Ave NE	Central Ave NE	11	0.11	26,500
15	Lagoon Ave W	Hennepin Ave S	11	0.11	27,600
16	Franklin Ave W	Lyndale Ave S	11	0.08	37,100
17	Lake St E	Chicago Ave S	10	0.09	32,200
18	Lowry Ave N	Penn Ave N	9	0.11	21,750
19	4th St SE	15th Ave SE	9	0.10	24,800
20	24th St W	Lyndale Ave S	9	0.09	27,825
21	Franklin Ave E	Park Ave S	9	0.09	29,000
22	Lake St E	Cedar Ave S	9	0.07	37,000
23	Lake St E	28th Ave S	8	0.15	15,150
24	Lake St W	Bryant Ave S	8	0.09	25,200
25	38th St E	Minnehaha Ave S	8	0.14	15,825

Source for Pedestrian Crash Data: 10-Year Database

Source for Vehicle Volume Data: City of Minneapolis



Engineering

Street and intersection design is one of the tools that the city and other agencies will need to employ to reduce pedestrian crashes. Good design improves the comfort of the pedestrian realm and reduces conflicts between pedestrians and other modes. This section suggests several strategies to be considered relative to street design and operation.

Engineering strategies that can help improve pedestrian safety include:

- **Visibility of Crosswalks and Crossings** - While Minnesota State Statute establishes pedestrians' right to cross at any intersection regardless of the presence of a marked crosswalk, marked crosswalks serve as a guide for pedestrians and as a way to communicate pedestrian right-of-way to motorists. Unsignalized marked crosswalks should be considered for additional treatments such as flashers or median refuge.
- **Pedestrian Refuges** - Refuge islands reduce the distance and time that pedestrians are exposed to vehicle traffic. They are best applied where vehicle volumes or number of lanes make crossing difficult.
- **Intersection Radii** - Minimizing corner radii serves to reduce vehicle turning speeds and shorten pedestrian crossings at the intersection.
- **Curb Extensions** – Bumping curbs out at intersections improves the visibility of pedestrians, as well as reducing crossing distance. Where curb extensions are not feasible, parking clearance of 20 to 25 feet from the crosswalk can still be used to make sure drivers and pedestrians can see each other.
- **Road Narrowing** - Fewer lanes and conflict points will help reduce pedestrian crashes. Reduce crossing distances by eliminating lanes when feasible.
- **Leading Pedestrian Interval (LPI)** – A LPI is a signal design feature that gives the walk signal to pedestrians prior to a green light for automobiles. This strategy has the most benefit where there are significant conflicts or crashes with turning vehicles, especially left-turning vehicles.
- **Reducing Speed Limits** – Higher vehicle speeds result in greater chance of a pedestrian crash resulting in a fatality or serious injury.
- **Left Turn Treatments** - When a fully protected left turn phase is not feasible, a Flashing Yellow Arrow can include a protected only phase only when the push button is pressed.
- **Appropriate Design Speeds** - Advocate for lower design speeds to reduce required width and number of lanes and ultimately increase pedestrian comfort.

Narrowing lanes, shortening crossing distances, reducing conflicts with turning vehicles, reducing vehicle speeds, and other traffic calming measures decrease pedestrian fatality and serious injury rates.

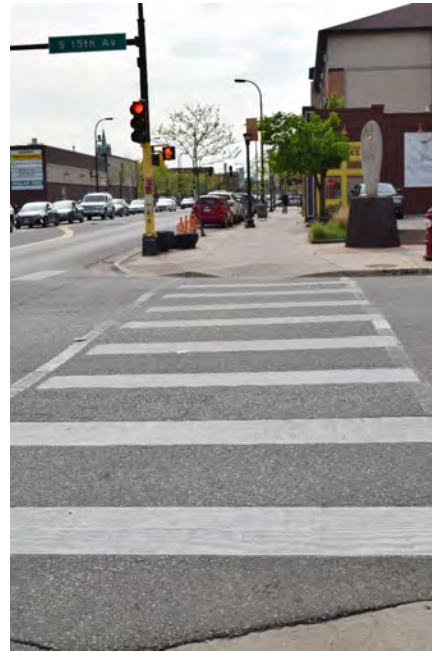


Figure 6-1. Example of Zebra Crosswalk
The intersection of 15th Avenue South and Franklin Avenue has visible, zebra-style crossings that reinforce pedestrian presence.

Desirable



- Wide pedestrian zone
- Small corner radius
- Ample corner space
- Straight path of travel

Undesirable



- Narrow pedestrian zone
- Large corner radius
- Little corner space
- Indirect path of travel

Figure 6-2. Access Minneapolis Design Guidelines for Streets and Sidewalks

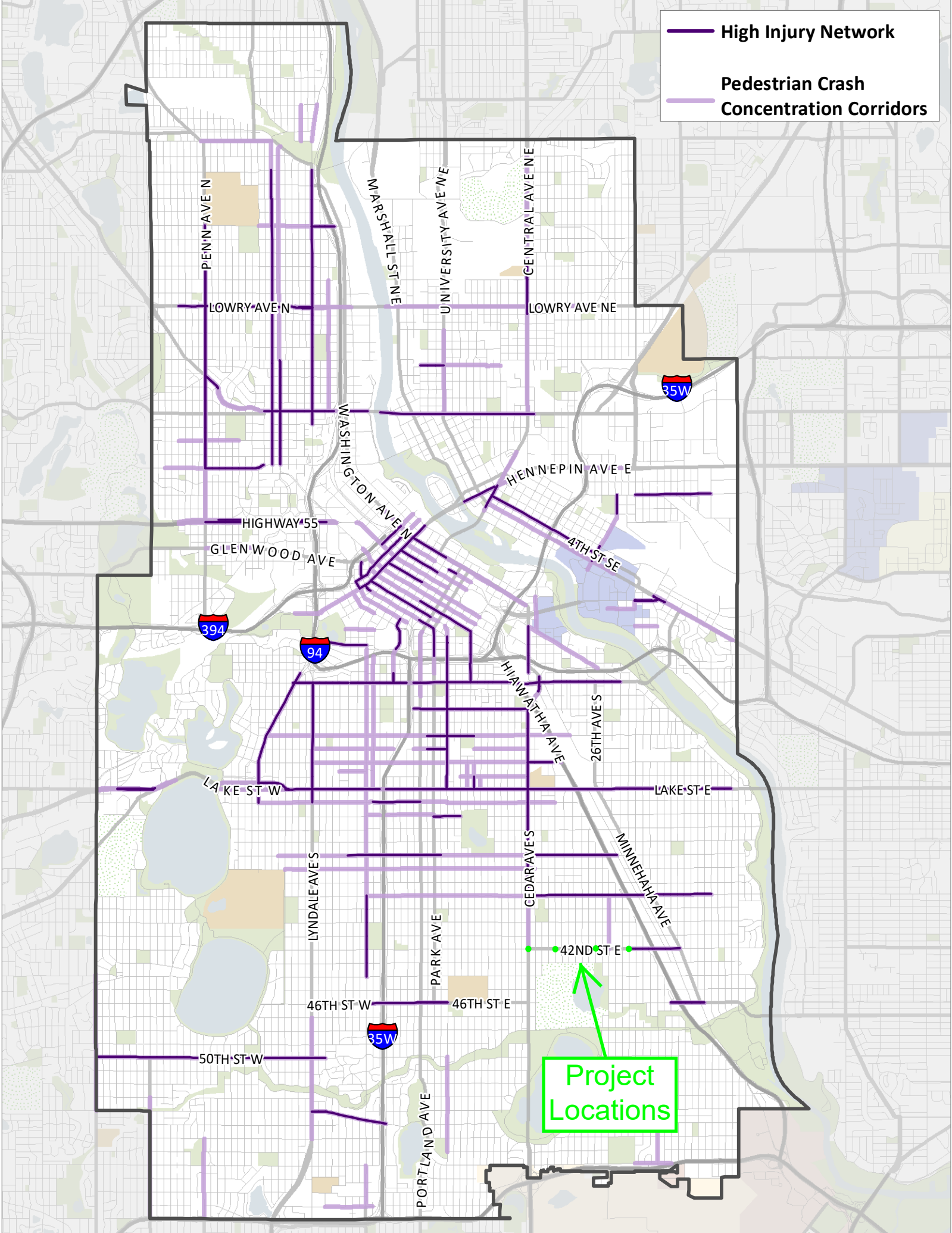
The design guidelines in Access Minneapolis note that small corners and straight pedestrian travel paths are preferred over large radii and indirect pedestrian paths.



Urban Intersection Prioritization for Hennepin County - PED/BIKE RELATED

List No.	County Rank	CRSP 2 ID	Route System	Route No.	County	Description	Risk Factors							Tiebreaker		
							Traffic Control	Entering ADT	Adjacent Development	Max Number of Lanes Crossed	Presence of Refuge Island	Pedestrian Crossing Type	Presence of Transit Stop		Total Stars	Crash Cost
1028	1	1520052	NV	152	Hennepin	County Road 152 at CSAH 3 (Lake Street East)	★	★	★	★	★	★	★	★	★★★★★★	\$16,981,000
119	2	30294	NV	3	Hennepin	County Road 3 at 27th Avenue South	★	★	★	★	★	★	★	★	★★★★★★	\$12,543,800
87	3	30178	NV	3	Hennepin	County Road 3 at Market Plaza	★	★	★	★	★	★	★	★	★★★★★★	\$12,261,200
1105	4	1530056	NV	153	Hennepin	County Road 153 at 2nd Street North	★	★	★	★	★	★	★	★	★★★★★★	\$11,884,200
855	5	810004	NV	81	Hennepin	County Road 81 at Lyndale Avenue North	★	★	★	★	★	★	★	★	★★★★★★	\$8,060,200
1070	6	1520194	NV	152	Hennepin	County Road 152 at 42nd Avenue North	★	★	★	★	★	★	★	★	★★★★★★	\$4,817,800
151	7	50222	NV	5	Hennepin	County Road 5 at Nicollet Avenue	★	★	★	★	★	★	★	★	★★★★★★	\$4,761,200
1053	8	1520114	NV	152	Hennepin	County Road 152 at CSAH 52 (Hennepin Avenue)	★	★	★	★	★	★	★	★	★★★★★★	\$4,732,800
1108	9	1530068	NV	153	Hennepin	County Road 153 at State Highway 47 (University Avenue Northeast)	★	★	★	★	★	★	★	★	★★★★★★	\$4,618,400
390	10	220070	NV	22	Hennepin	County Road 22 at 24th Street West	★	★	★	★	★	★	★	★	★★★★★★	\$4,262,200
155	11	50244	NV	5	Hennepin	County Road 5 at Chicago Avenue	★	★	★	★	★	★	★	★	★★★★★★	\$4,209,200
104	12	30236	NV	3	Hennepin	County Road 3 at 1st Avenue South	★	★	★	★	★	★	★	★	★★★★★★	\$4,027,600
101	13	30230	NV	3	Hennepin	County Road 3 at Pillsbury Avenue	★	★	★	★	★	★	★	★	★★★★★★	\$3,641,000
858	14	810012	NV	81	Hennepin	County Road 81 at Emerson Avenue North	★	★	★	★	★	★	★	★	★★★★★★	\$3,404,400
57	15	20066	NV	2	Hennepin	County Road 2 at CSAH 153 (Lowry Avenue North)	★	★	★	★	★	★	★	★	★★★★★★	\$3,362,000
153	16	50232	NV	5	Hennepin	County Road 5 at 3rd Avenue South	★	★	★	★	★	★	★	★	★★★★★★	\$3,334,800
392	17	220074	NV	22	Hennepin	County Road 22 at CSAH 5 (Franklin Avenue West)	★	★	★	★	★	★	★	★	★★★★★★	\$3,314,600
102	18	30232	NV	3	Hennepin	County Road 3 at Blaisdell Avenue South	★	★	★	★	★	★	★	★	★★★★★★	\$3,199,600
1112	19	1530092	NV	153	Hennepin	County Road 153 at State Highway 65 (Central Avenue Northeast)	★	★	★	★	★	★	★	★	★★★★★★	\$3,098,800
388	20	220062	NV	22	Hennepin	County Road 22 at 28th Street West	★	★	★	★	★	★	★	★	★★★★★★	\$3,018,800
391	21	220072	NV	22	Hennepin	County Road 22 at 22nd Street West	★	★	★	★	★	★	★	★	★★★★★★	\$2,999,600
857	22	810010	NV	81	Hennepin	County Road 81 at Dupont Avenue North	★	★	★	★	★	★	★	★	★★★★★★	\$2,980,800
314	23	170010	NV	17	Hennepin	County Road 17 at 102nd Street West	★	★	★	★	★	★	★	★	★★★★★★	\$2,889,200
120	24	30296	NV	3	Hennepin	County Road 3 at 28th Avenue South	★	★	★	★	★	★	★	★	★★★★★★	\$2,886,800
1066	25	1520168	NV	152	Hennepin	County Road 152 at CSAH 153 (Lowry Avenue North)	★	★	★	★	★	★	★	★	★★★★★★	\$2,757,000
55	26	20052	NV	2	Hennepin	County Road 2 at CSAH 81 (West Broadway)	★	★	★	★	★	★	★	★	★★★★★★	\$2,705,800
114	27	30272	NV	3	Hennepin	County Road 3 at Bloomington Avenue South	★	★	★	★	★	★	★	★	★★★★★★	\$2,667,800
108	28	30248	NV	3	Hennepin	County Road 3 at 4th Avenue South	★	★	★	★	★	★	★	★	★★★★★★	\$2,634,800
496	29	330034	NV	33	Hennepin	County Road 33 at CSAH 3 (Lake Street East)	★	★	★	★	★	★	★	★	★★★★★★	\$2,607,600
994	30	1300040	NV	130	Hennepin	County Road 130 at Northland Drive North	★	★	★	★	★	★	★	★	★★★★★★	\$2,596,400
818	31	660082	NV	66	Hennepin	County Road 66 at 2nd Street North	★	★	★	★	★	★	★	★	★★★★★★	\$2,555,000
152	32	50224	NV	5	Hennepin	County Road 5 at 1st Avenue South	★	★	★	★	★	★	★	★	★★★★★★	\$2,429,800
1027	33	1520050	NV	152	Hennepin	County Road 152 at 31st Street East	★	★	★	★	★	★	★	★	★★★★★★	\$2,339,600
941	34	1020040	NV	102	Hennepin	County Road 102 at 36th Avenue North	★	★	★	★	★	★	★	★	★★★★★★	\$2,274,000
1002	35	1300088	NV	130	Hennepin	County Road 130 at Zane Avenue North	★	★	★	★	★	★	★	★	★★★★★★	\$2,137,000
1022	36	1520036	NV	152	Hennepin	County Road 152 at 38th Street East	★	★	★	★	★	★	★	★	★★★★★★	\$2,095,600
349	37	1900666	NV	19	Hennepin	County Road 19 at CSAH 15 (Shoreline Drive)	★	★	★	★	★	★	★	★	★★★★★★	\$2,080,800
1061	38	1520136	NV	152	Hennepin	County Road 152 at Plymouth Avenue North	★	★	★	★	★	★	★	★	★★★★★★	\$1,981,200
150	39	50220	NV	5	Hennepin	County Road 5 at Lasalle Avenue / Blaisdell Avenue South	★	★	★	★	★	★	★	★	★★★★★★	\$1,959,800
1055	40	1520118	NV	152	Hennepin	County Road 152 at 2nd Avenue North	★	★	★	★	★	★	★	★	★★★★★★	\$1,939,000
98	41	30216	NV	3	Hennepin	County Road 3 at Bryant Avenue South	★	★	★	★	★	★	★	★	★★★★★★	\$1,863,200
259	42	120013	NV	12	Hennepin	County Road 12 at 95th Avenue North	★	★	★	★	★	★	★	★	★★★★★★	\$1,703,200
1041	43	1520088	NV	152	Hennepin	County Road 152 at 15th Avenue South / Washington Avenue South	★	★	★	★	★	★	★	★	★★★★★★	\$1,639,200
658	44	520028	NV	52	Hennepin	County Road 52 at 86th Street West / 86th Street East	★	★	★	★	★	★	★	★	★★★★★★	\$1,596,400
1127	45	1560052	NV	156	Hennepin	County Road 156 at 36th Avenue North	★	★	★	★	★	★	★	★	★★★★★★	\$1,578,800
387	46	220058	NV	22	Hennepin	County Road 22 at 31st Street West	★	★	★	★	★	★	★	★	★★★★★★	\$1,531,000
122	47	30302	NV	3	Hennepin	County Road 3 at 31st Avenue South	★	★	★	★	★	★	★	★	★★★★★★	\$1,520,400
143	48	50130	NV	5	Hennepin	County Road 5 at Louisiana Avenue South	★	★	★	★	★	★	★	★	★★★★★★	\$1,492,000
100	49	30226	NV	3	Hennepin	County Road 3 at Grand Avenue South	★	★	★	★	★	★	★	★	★★★★★★	\$1,486,000
612	50	430006	NV	43	Hennepin	County Road 43 at Hennepin Avenue	★	★	★	★	★	★	★	★	★★★★★★	\$1,459,400

-  High Injury Network
-  Pedestrian Crash Concentration Corridors



Project Locations

Engineering

Street and intersection design is one of the tools that the city and other agencies will need to employ to reduce pedestrian crashes. Good design improves the comfort of the pedestrian realm and reduces conflicts between pedestrians and other modes. This section suggests several strategies to be considered relative to street design and operation.

Engineering strategies that can help improve pedestrian safety include:

- **Visibility of Crosswalks and Crossings** - While Minnesota State Statute establishes pedestrians' right to cross at any intersection regardless of the presence of a marked crosswalk, marked crosswalks serve as a guide for pedestrians and as a way to communicate pedestrian right-of-way to motorists. Unsignalized marked crosswalks should be considered for additional treatments such as flashers or median refuge.
- **Pedestrian Refuges** - Refuge islands reduce the distance and time that pedestrians are exposed to vehicle traffic. They are best applied where vehicle volumes or number of lanes make crossing difficult.
- **Intersection Radii** - Minimizing corner radii serves to reduce vehicle turning speeds and shorten pedestrian crossings at the intersection.
- **Curb Extensions** – Bumping curbs out at intersections improves the visibility of pedestrians, as well as reducing crossing distance. Where curb extensions are not feasible, parking clearance of 20 to 25 feet from the crosswalk can still be used to make sure drivers and pedestrians can see each other.
- **Road Narrowing** - Fewer lanes and conflict points will help reduce pedestrian crashes. Reduce crossing distances by eliminating lanes when feasible.
- **Leading Pedestrian Interval (LPI)** – A LPI is a signal design feature that gives the walk signal to pedestrians prior to a green light for automobiles. This strategy has the most benefit where there are significant conflicts or crashes with turning vehicles, especially left-turning vehicles.
- **Reducing Speed Limits** – Higher vehicle speeds result in greater chance of a pedestrian crash resulting in a fatality or serious injury.
- **Left Turn Treatments** - When a fully protected left turn phase is not feasible, a Flashing Yellow Arrow can include a protected only phase only when the push button is pressed.
- **Appropriate Design Speeds** - Advocate for lower design speeds to reduce required width and number of lanes and ultimately increase pedestrian comfort.

Narrowing lanes, shortening crossing distances, reducing conflicts with turning vehicles, reducing vehicle speeds, and other traffic calming measures decrease pedestrian fatality and serious injury rates.

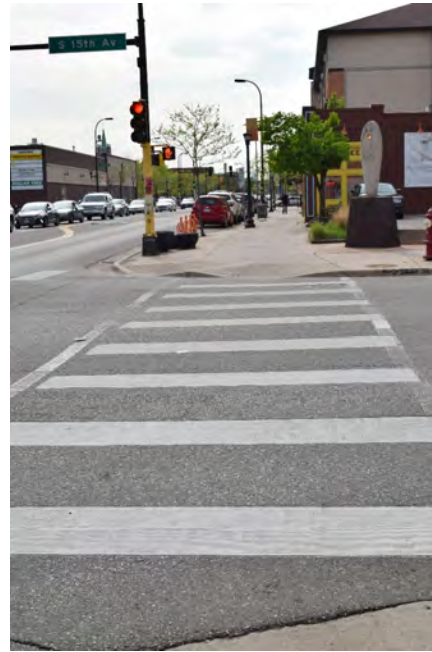


Figure 6-1. Example of Zebra Crosswalk
The intersection of 15th Avenue South and Franklin Avenue has visible, zebra-style crossings that reinforce pedestrian presence.

Desirable



- Wide pedestrian zone
- Small corner radius
- Ample corner space
- Straight path of travel

Undesirable



- Narrow pedestrian zone
- Large corner radius
- Little corner space
- Indirect path of travel

Figure 6-2. Access Minneapolis Design Guidelines for Streets and Sidewalks

The design guidelines in Access Minneapolis note that small corners and straight pedestrian travel paths are preferred over large radii and indirect pedestrian paths.



Urban Intersection Prioritization for Hennepin County - PED/BIKE RELATED

List No.	County Rank	CRSP 2 ID	Route System	Route No.	County	Description	Risk Factors							Tiebreaker	
							Traffic Control	Entering ADT	Adjacent Development	Max Number of Lanes Crossed	Presence of Refuge Island	Pedestrian Crossing Type	Presence of Transit Stop		Total Stars
645	101	480046	NV	48	Hennepin	County Road 48 at CSAH 3 (Lake Street East)	★	★	★		★	★	★	★★★★★	\$3,309,400
821	102	660092	NV	66	Hennepin	County Road 66 at State Highway 47 (University Avenue Northeast)	★	★	★	★		★	★	★★★★★	\$3,183,400
534	103	350048	NV	35	Hennepin	County Road 35 at CSAH 3 (Lake Street East)	★	★	★		★	★	★	★★★★★	\$3,153,800
318	104	170038	NV	17	Hennepin	County Road 17 at American Boulevard West	★	★	★	★		★	★	★★★★★	\$3,072,000
1107	105	1530064	NV	153	Hennepin	County Road 153 at 2nd Street Northeast	★	★	★	★		★	★	★★★★★	\$2,830,600
1020	106	1520026	NV	152	Hennepin	County Road 152 at CSAH 42 (42nd Street East)	★	★	★		★	★	★	★★★★★	\$2,777,800
566	107	360002	NV	36	Hennepin	County Road 36 at 10th Avenue Southeast	★	★	★		★	★	★	★★★★★	\$2,644,600
116	108	30286	NV	3	Hennepin	County Road 3 at 21st Avenue South	★	★	★	★		★	★	★★★★★	\$2,351,800
49	109	20030	NV	2	Hennepin	County Road 2 at Plymouth Avenue North	★	★	★		★	★	★	★★★★★	\$2,280,400
1101	110	1530032	NV	153	Hennepin	County Road 153 at Fremont Avenue North	★	★	★		★	★	★	★★★★★	\$2,265,000
1129	111	1560062	NV	156	Hennepin	County Road 156 at CSAH 9 (42nd Avenue North)	★	★	★	★		★	★	★★★★★	\$2,260,000
1113	112	1530106	NV	153	Hennepin	County Road 153 at Johnson Street Northeast	★	★		★		★	★	★★★★★	\$2,199,000
1132	113	1560080	NV	156	Hennepin	County Road 156 at 49th Avenue North	★	★		★		★	★	★★★★★	\$2,133,800
337	114	170088	NV	17	Hennepin	County Road 17 at 54th Street West	★	★	★		★	★	★	★★★★★	\$2,033,000
1029	115	1520056	NV	152	Hennepin	County Road 152 at 28th Street East	★	★		★		★	★	★★★★★	\$2,018,400
1111	116	1530086	NV	153	Hennepin	County Road 153 at Monroe Street Northeast	★	★	★	★		★	★	★★★★★	\$1,973,400
742	117	610024	NV	61	Hennepin	County Road 61 at Prairie Center Drive	★	★	★	★		★	★	★★★★★	\$1,954,800
156	118	50250	NV	5	Hennepin	County Road 5 at 11th Avenue South	★	★	★		★	★	★	★★★★★	\$1,855,600
1103	119	1530048	NV	153	Hennepin	County Road 153 at Lyndale Avenue North	★	★	★		★	★	★	★★★★★	\$1,845,600
498	120	330040	NV	33	Hennepin	County Road 33 at 26th Street East	★	★	★		★	★	★	★★★★★	\$1,829,200
1089	121	1520299	NV	152	Hennepin	County Road 152 at 68th Avenue North	★		★	★		★	★	★★★★★	\$1,818,200
261	122	120018	NV	12	Hennepin	County Road 12 at 101st Avenue North	★	★	★	★		★	★	★★★★★	\$1,771,400
820	123	660088	NV	66	Hennepin	County Road 66 at 2nd Street Northeast	★	★	★	★		★	★	★★★★★	\$1,746,200
870	124	810058	NV	81	Hennepin	County Road 81 at CSAH 9 (42nd Avenue North / Lake Drive)	★	★	★	★		★	★	★★★★★	\$1,725,400
88	125	30180	NV	3	Hennepin	County Road 3 at CSAH 25 (Lake Street West)	★	★	★	★		★	★	★★★★★	\$1,725,000
587	126	390010	NV	39	Hennepin	County Road 39 at Plaza Drive / Topview Road	★	★	★	★		★	★	★★★★★	\$1,707,600
640	127	480030	NV	48	Hennepin	County Road 48 at 35th Street East	★	★	★		★	★	★	★★★★★	\$1,670,000
32	128	10219	NV	1	Hennepin	County Road 1 at Old Cedar Avenue South	★	★	★	★		★	★	★★★★★	\$1,591,800
1039	129	1520084	NV	152	Hennepin	County Road 152 at 3rd Street South	★	★	★	★		★	★	★★★★★	\$1,590,400
154	130	50234	NV	5	Hennepin	County Road 5 at Clinton Avenue South	★		★	★		★	★	★★★★★	\$1,527,000
1044	131	1520094	NV	152	Hennepin	County Road 152 at 11th Avenue South	★	★	★		★	★	★	★★★★★	\$1,488,000
113	132	30266	NV	3	Hennepin	County Road 3 at 13th Avenue South	★	★	★	★		★	★	★★★★★	\$1,456,600
908	133	1010030	NV	101	Hennepin	County Road 101 at CSAH 3 (Excelsior Boulevard) / Old Excelsior Boulevard	★	★	★	★		★	★	★★★★★	\$1,443,000
899	134	880008	NV	88	Hennepin	County Road 88 at St Anthony Boulevard	★	★	★	★		★	★	★★★★★	\$1,406,800
159	135	50260	NV	5	Hennepin	County Road 5 at Bloomington Avenue South	★	★	★		★	★	★	★★★★★	\$1,405,000
969	136	1090012	NV	109	Hennepin	County Road 109 at Hemlock Lane North / Zachary Lane North	★	★	★	★		★	★	★★★★★	\$1,391,000
1046	137	1520100	NV	152	Hennepin	County Road 152 at Chicago Avenue	★		★	★		★	★	★★★★★	\$1,369,800
418	138	270006	NV	27	Hennepin	County Road 27 at CSAH 66 (Broadway Street Northeast)	★	★	★	★		★	★	★★★★★	\$1,346,600
825	139	660120	NV	66	Hennepin	County Road 66 at Fillmore Street Northeast	★	★		★		★	★	★★★★★	\$1,331,600
401	140	230032	NV	23	Hennepin	County Road 23 at CSAH 153 (Lowry Avenue North)	★	★	★	★		★	★	★★★★★	\$1,329,600
204	141	90040	NV	9	Hennepin	County Road 9 at Xylon Avenue North	★	★		★		★	★	★★★★★	\$1,301,400
1047	142	1520102	NV	152	Hennepin	County Road 152 at 5th Avenue South	★		★	★		★	★	★★★★★	\$1,295,200
637	143	480020	NV	48	Hennepin	County Road 48 at 38th Street East	★	★	★		★	★	★	★★★★★	\$1,294,600
911	144	1010035	NV	101	Hennepin	County Road 101 at Seven Hi Drive	★	★	★	★		★	★	★★★★★	\$1,288,000
859	145	810014	NV	81	Hennepin	County Road 81 at Fremont Avenue North	★	★	★	★		★	★	★★★★★	\$1,279,200
508	146	330070	NV	33	Hennepin	County Road 33 at 6th Street South	★	★	★		★	★	★	★★★★★	\$1,279,000
665	147	520048	NV	52	Hennepin	County Road 52 at 77th Street West / 77th Street East	★	★	★	★		★	★	★★★★★	\$1,242,800
995	148	1300042	NV	130	Hennepin	County Road 130 at Boone Avenue North	★	★	★	★		★	★	★★★★★	\$1,236,000
399	149	230020	NV	23	Hennepin	County Road 23 at 13th Avenue Northeast	★		★	★		★	★	★★★★★	\$1,210,600
203	150	90034	NV	9	Hennepin	County Road 9 at Boone Avenue North	★	★		★		★	★	★★★★★	\$1,209,000

Urban Intersection Prioritization for Hennepin County - PED/BIKE RELATED

List No.	County Rank	CRSP 2 ID	Route System	Route No.	County	Description	Risk Factors							Tiebreaker		
							Traffic Control	Entering ADT	Adjacent Development	Max Number of Lanes Crossed	Presence of Refuge Island	Pedestrian Crossing Type	Presence of Transit Stop		Total Stars	Crash Cost
986	1101	1100036	NV	110	Hennepin	County Road 110 at CSAH 125 (Bartlett Boulevard)						★	★	\$288,200		
171	1102	60108	NV	6	Hennepin	County Road 6 at Shenandoah Lane North		★					★	\$272,600		
355	1103	190156	NV	19	Hennepin	County Road 19 at CSAH 29						★	★	\$272,600		
246	1104	100190	NV	10	Hennepin	County Road 10 at Halifax Avenue North (East Junction)						★	★	\$257,000		
427	1105	280018	NV	28	Hennepin	County Road 28 at Lindstrom Drive						★	★	\$257,000		
871	1106	810060	NV	81	Hennepin	County Road 81 at State Highway 100 Northbound Ramps	★						★	\$248,000		
400	1107	230028	NV	23	Hennepin	County Road 23 at 22nd Avenue Northeast						★	★	\$244,200		
436	1108	300032	NV	30	Hennepin	County Road 30 at Troy Lane North	★						★	\$228,600		
304	1109	150108	NV	15	Hennepin	County Road 15 at CSAH 51 (North Shore Drive)							★	\$220,800		
609	1110	420040	NV	42	Hennepin	County Road 42 at Snelling Avenue						★	★	\$201,200		
607	1111	420028	NV	42	Hennepin	County Road 42 at Nokomis Avenue South						★	★	\$197,400		
177	1112	80018	NV	8	Hennepin	County Road 8 at 47th Avenue North						★	★	\$197,400		
736	1113	600080	NV	60	Hennepin	County Road 60 at Orchard Road						★	★	\$181,800		
731	1114	600044	NV	60	Hennepin	County Road 60 at Rowland Road						★	★	\$181,800		
650	1115	480056	NV	48	Hennepin	County Road 48 at 24th Street East						★	★	\$180,600		
878	1116	810081	NV	81	Hennepin	County Road 81 at Interstate 94 Eastbound Ramps	★						★	\$177,800		
350	1117	190080	NV	19	Hennepin	County Road 19 at CSAH 51 (Sunset Drive)						★	★	\$177,800		
308	1118	160020	NV	16	Hennepin	County Road 16 at Oak Lea Drive						★	★	\$170,000		
735	1119	600068	NV	60	Hennepin	County Road 60 at Lake Street Extension				★			★	\$170,000		
245	1120	100184	NV	10	Hennepin	County Road 10 at June Avenue North (West Junction)						★	★	\$170,000		
1146	1121	2020008	NV	202	Hennepin	County Road 202 at 96th Avenue North							★	\$149,400		
298	1122	150040	NV	15	Hennepin	County Road 15 at Auditors Road			★				★	\$149,400		
1098	1123	1530000	NV	153	Hennepin	County Road 153 at Theodore Wirth Parkway / Oakdale Avenue North							★	\$133,800		
422	1124	270014	NV	27	Hennepin	County Road 27 at St Anthony Parkway							★	\$102,600		
901	1125	880014	NV	88	Hennepin	County Road 88 at Old Highway 8		★					★	\$102,600		
626	1126	460056	NV	46	Hennepin	County Road 46 at 41st Avenue South			★				★	\$94,800		
307	1127	160010	NV	16	Hennepin	County Road 16 at Crosby Road						★	★	\$94,800		
292	1128	140066	NV	14	Hennepin	County Road 14 at 113th Avenue North						★	★	\$87,000		
296	1129	150032	NV	15	Hennepin	County Road 15 at Grandview Boulevard						★	★	\$87,000		
1003	1130	1350000	NV	135	Hennepin	County Road 135 at CSAH 51 (North Shore Drive)						★	★	\$87,000		
639	1131	480028	NV	48	Hennepin	County Road 48 at 31st Avenue South						★	★	\$31,200		
353	1132	190116	NV	19	Hennepin	County Road 19 at CSAH 151 (West Branch Road)						★	★	\$23,400		
297	1133	150034	NV	15	Hennepin	County Road 15 at Cottonwood Lane						★	★	\$23,400		
221	1134	90120	NV	9	Hennepin	County Road 9 at Xerxes Avenue North						★	★	\$7,800		
222	1135	90126	NV	9	Hennepin	County Road 9 at Sheridan Avenue North						★	★	\$7,800		
223	1136	90128	NV	9	Hennepin	County Road 9 at Russell Avenue North						★	★	\$7,800		
594	1137	400012	NV	40	Hennepin	County Road 40 at Western Avenue						★	★	\$7,800		
765	1138	610108	NV	61	Hennepin	County Road 61 at Huntingdon Drive						★	★	\$7,800		
959	1139	1030062	NV	103	Hennepin	County Road 103 at 120th Avenue North (South Junction)						★	★	\$7,800		
985	1140	1100032	NV	110	Hennepin	County Road 110 at Highland Boulevard						★	★	\$7,800		
266	1141	120046	NV	12	Hennepin	County Road 12 at Xenia Avenue North				★			★	\$0		
592	1142	400002	NV	40	Hennepin	County Road 40 at Harold Avenue						★	★	\$0		
616	1143	440022	NV	44	Hennepin	County Road 44 at Ridgewood Road						★	★	\$0		
895	1144	840020	NV	84	Hennepin	County Road 84 at Leaf Street						★	★	\$0		
960	1145	1030064	NV	103	Hennepin	County Road 103 at 120th Avenue North (North Junction)						★	★	\$0		
1149	1146	2020030	NV	202	Hennepin	County Road 202 at 109th Avenue North							★	\$0		
1080	1147	1520273	NV	152	Hennepin	County Road 152 at State Highway 100 Northbound Ramps								\$170,000		
904	1148	1010000	NV	101	Hennepin	County Road 101 at Townline Road								\$126,000		
294	1149	140076	NV	14	Hennepin	County Road 14 at 117th Avenue North								\$102,600		
802	1150	620024	NV	62	Hennepin	County Road 62 at Boulder Creek Drive / Eden Drive North								\$94,800		

Urban Intersection Prioritization Hennepin County - VEHICLE RELATED

List No.	County		Route		County	Description	Risk Factors					Tiebreaker		
	Rank	County ID	System	No.			Area Type	Traffic Control	Entering ADT OR Cross Product	Leg Configuration	Adjacent Development	Major Approach Left Turn Phasing	Total Stars	Crash Cost
110	93	30258	NV	3	Hennepin	County Road 3 at Elliot Avenue South	*	*	*	*	*	*	*****	\$606,600
1056	94	1520120	NV	152	Hennepin	County Road 152 at 3rd Avenue North	*	*	*	*	*	*	*****	\$558,600
1058	95	1520124	NV	152	Hennepin	County Road 152 at 6th Avenue North	*	*	*	*	*	*	*****	\$493,400
605	96	400112	NV	40	Hennepin	County Road 40 at 7th Street North / 9th Street North / 2nd Avenue North	*	*	*	*	*	*	*****	\$389,600
232	97	100085	NV	10	Hennepin	County Road 10 at Sycamore Lane North	*	*	*	*	*	*	*****	\$339,000
1060	98	1520132	NV	152	Hennepin	County Road 152 at 10th Avenue North	*	*	*	*	*	*	*****	\$287,000
95	99	30206	NV	3	Hennepin	County Road 3 at Girard Avenue South	*	*	*	*	*	*	*****	\$275,400
523	100	350010	NV	35	Hennepin	County Road 35 at 7th Street South	*	*	*	*	*	*	*****	\$252,000
853	101	810000	NV	81	Hennepin	County Road 81 at Interstate 94 Eastbound Ramps	*	*	*	*	*	*	*****	\$193,400
1043	102	1520091	NV	152	Hennepin	County Road 152 at Interstate 35W Southbound Ramps	*	*	*	*	*	*	*****	\$102,600
197	103	90019	NV	9	Hennepin	County Road 9 at Interstate 494 Northbound Ramps	*	*	*	*	*	*	*****	\$102,600
1042	104	1520090	NV	152	Hennepin	County Road 152 at Interstate 35W Northbound Ramps	*	*	*	*	*	*	*****	\$19,256,400
1028	105	1520052	NV	152	Hennepin	County Road 152 at CSAH 3 (Lake Street East)	*	*	*	*	*	*	*****	\$16,981,000
579	106	370009	NV	37	Hennepin	County Road 37 at 15th Avenue Southeast	*	*	*	*	*	*	*****	\$13,145,600
15	107	20000	NV	2	Hennepin	County Road 2 at Interstate 394 Eastbound Ramps	*	*	*	*	*	*	*****	\$12,029,600
332	108	170065	NV	17	Hennepin	County Road 17 at State Highway 62 Eastbound Ramps	*	*	*	*	*	*	*****	\$11,956,800
1064	109	1520152	NV	152	Hennepin	County Road 152 at 22nd Avenue North	*	*	*	*	*	*	*****	\$11,897,200
1105	110	1530056	NV	153	Hennepin	County Road 153 at 2nd Street North	*	*	*	*	*	*	*****	\$11,884,200
1142	111	1580050	NV	158	Hennepin	County Road 158 at Interlachen Boulevard	*	*	*	*	*	*	*****	\$11,370,200
53	112	50238	NV	5	Hennepin	County Road 5 at 5th Avenue South	*	*	*	*	*	*	*****	\$8,434,800
690	113	520150	NV	52	Hennepin	County Road 52 at 11th Avenue Southeast	*	*	*	*	*	*	*****	\$7,231,200
1032	114	1520065	NV	152	Hennepin	County Road 152 at State Highway 55 Southbound Ramps	*	*	*	*	*	*	*****	\$5,812,600
161	115	50268	NV	5	Hennepin	County Road 5 at CSAH 152 (Cedar Avenue South)	*	*	*	*	*	*	*****	\$5,101,000
1108	116	1530068	NV	153	Hennepin	County Road 153 at State Highway 47 (University Avenue Northeast)	*	*	*	*	*	*	*****	\$4,618,400
390	117	220070	NV	22	Hennepin	County Road 22 at 24th Street West	*	*	*	*	*	*	*****	\$4,262,200
359	118	200014	NV	20	Hennepin	County Road 20 at State Highway 7	*	*	*	*	*	*	*****	\$3,940,400
583	119	370018	NV	37	Hennepin	County Road 37 at 10th Avenue Southeast	*	*	*	*	*	*	*****	\$3,820,800
460	120	310031	NV	31	Hennepin	County Road 31 at State Highway 62 Eastbound Ramps	*	*	*	*	*	*	*****	\$3,755,600
398	121	230018	NV	23	Hennepin	County Road 23 at CSAH 66 (Broadway Street Northeast)	*	*	*	*	*	*	*****	\$3,718,400
530	122	350032	NV	35	Hennepin	County Road 35 at CSAH 5 (Franklin Avenue East)	*	*	*	*	*	*	*****	\$3,497,800
824	123	660114	NV	66	Hennepin	County Road 66 at State Highway 65 (Central Avenue Northeast)	*	*	*	*	*	*	*****	\$3,485,000
1030	124	1520060	NV	152	Hennepin	County Road 152 at 26th Street East	*	*	*	*	*	*	*****	\$3,481,800
558	125	350160	NV	35	Hennepin	County Road 35 at American Boulevard East	*	*	*	*	*	*	*****	\$3,419,800
821	126	660092	NV	66	Hennepin	County Road 66 at State Highway 47 (University Avenue Northeast)	*	*	*	*	*	*	*****	\$3,183,400
1112	127	1530092	NV	153	Hennepin	County Road 153 at State Highway 65 (Central Avenue Northeast)	*	*	*	*	*	*	*****	\$3,098,800
318	128	170038	NV	17	Hennepin	County Road 17 at American Boulevard West	*	*	*	*	*	*	*****	\$3,072,000
487	129	320093	NV	32	Hennepin	County Road 32 at State Highway 62 Eastbound Ramps	*	*	*	*	*	*	*****	\$3,021,600
89	130	30182	NV	3	Hennepin	County Road 3 at Dean Parkway (West Junction)	*	*	*	*	*	*	*****	\$3,007,400
314	131	170010	NV	17	Hennepin	County Road 17 at 102nd Street West	*	*	*	*	*	*	*****	\$2,889,200
120	132	30296	NV	3	Hennepin	County Road 3 at 28th Avenue South	*	*	*	*	*	*	*****	\$2,886,800
506	133	330066	NV	33	Hennepin	County Road 33 at 8th Street South	*	*	*	*	*	*	*****	\$2,876,600
160	134	50266	NV	5	Hennepin	County Road 5 at 17th Avenue South	*	*	*	*	*	*	*****	\$2,859,400
500	135	330048	NV	33	Hennepin	County Road 33 at CSAH 5 (Franklin Avenue East)	*	*	*	*	*	*	*****	\$2,855,800
1020	136	1520026	NV	152	Hennepin	County Road 152 at CSAH 42 (42nd Street East)	*	*	*	*	*	*	*****	\$2,777,800
320	137	170040	NV	17	Hennepin	County Road 17 at 78th Street West	*	*	*	*	*	*	*****	\$2,721,000
30	138	30289	NV	3	Hennepin	County Road 3 at State Highway 55 Southbound Ramps	*	*	*	*	*	*	*****	\$2,681,400

Urban Intersection Prioritization Hennepin County - VEHICLE RELATED

List No.	County Rank	County ID	Route System	Route No.	County	Description	Risk Factors					Tiebreaker	
							Area Type	Traffic Control	Entering ADT OR Cross Product	Leg Configuration	Adjacent Development	Major Approach Left Turn Phasing	Total Stars
436	1013	300032	NV	30	Hennepin	County Road 30 at Troy Lane North		★				★	\$228,600
843	1014	730038	NV	73	Hennepin	County Road 73 at Hillside Lane West			★			★	\$213,000
180	1015	80030	NV	8	Hennepin	County Road 8 at Corvallis Avenue North					★	★	\$213,000
987	1016	1100038	NV	110	Hennepin	County Road 110 at Auditors Road					★	★	\$209,000
816	1017	660070	NV	66	Hennepin	County Road 66 at Morgan Avenue North				★		★	\$205,200
932	1018	1020002	NV	102	Hennepin	County Road 102 at Country Club Drive					★	★	\$205,200
423	1019	270016	NV	27	Hennepin	County Road 27 at 29th Avenue Northeast				★		★	\$204,000
609	1020	420040	NV	42	Hennepin	County Road 42 at Snelling Avenue				★		★	\$201,200
607	1021	420028	NV	42	Hennepin	County Road 42 at Nokomis Avenue South				★		★	\$197,400
829	1022	660132	NV	66	Hennepin	County Road 66 at Cleveland Street Northeast				★		★	\$193,400
264	1023	120024	NV	12	Hennepin	County Road 12 at Kyle Avenue North				★		★	\$189,600
272	1024	120082	NV	12	Hennepin	County Road 12 at Cartway Road				★		★	\$189,600
815	1025	660062	NV	66	Hennepin	County Road 66 at Russell Avenue North				★		★	\$189,600
715	1026	570004	NV	57	Hennepin	County Road 57 at Victory Memorial Drive				★		★	\$189,600
945	1027	1020070	NV	102	Hennepin	County Road 102 at Fairview Avenue North				★		★	\$181,800
736	1028	600080	NV	60	Hennepin	County Road 60 at Orchard Road				★		★	\$181,800
650	1029	480056	NV	48	Hennepin	County Road 48 at 24th Street East				★		★	\$180,600
939	1030	1020036	NV	102	Hennepin	County Road 102 at 32nd Avenue North				★		★	\$174,000
36	1031	40025	NV	4	Hennepin	County Road 4 at Highway 212 Westbound Ramp		★				★	\$170,000
308	1032	160020	NV	16	Hennepin	County Road 16 at Oak Lea Drive				★		★	\$170,000
735	1033	600068	NV	60	Hennepin	County Road 60 at Lake Street Extension				★		★	\$170,000
1146	1034	2020008	NV	202	Hennepin	County Road 202 at 96th Avenue North				★		★	\$149,400
298	1035	150040	NV	15	Hennepin	County Road 15 at Auditors Road					★	★	\$149,400
1098	1036	1530000	NV	153	Hennepin	County Road 153 at Theodore Wirth Parkway / Oakdale Avenue North				★		★	\$133,800
31	1037	10206	NV	1	Hennepin	County Road 1 at 12th Avenue South			★			★	\$126,000
465	1038	310051	NV	31	Hennepin	County Road 31 at 51st Street West				★		★	\$118,200
940	1039	1020038	NV	102	Hennepin	County Road 102 at 34th Avenue North				★		★	\$110,400
930	1040	1010240	NV	101	Hennepin	County Road 101 at Territorial Road					★	★	\$110,400
769	1041	610140	NV	61	Hennepin	County Road 61 at Cedar Lake Road		★				★	\$102,600
828	1042	660130	NV	66	Hennepin	County Road 66 at Arthur Street Northeast				★		★	\$102,600
422	1043	270014	NV	27	Hennepin	County Road 27 at St Anthony Parkway				★		★	\$102,600
294	1044	140076	NV	14	Hennepin	County Road 14 at 117th Avenue North				★		★	\$102,600
901	1045	880014	NV	88	Hennepin	County Road 88 at Old Highway 8			★			★	\$102,600
597	1046	400035	NV	40	Hennepin	County Road 40 at State Highway 100 Northbound Ramp		★				★	\$94,800
1122	1047	1560020	NV	156	Hennepin	County Road 156 at Olympia Street		★				★	\$94,800
307	1048	160010	NV	16	Hennepin	County Road 16 at Crosby Road				★		★	\$94,800
701	1049	530028	NV	53	Hennepin	County Road 53 at Logan Avenue South			★			★	\$94,800
802	1050	620024	NV	62	Hennepin	County Road 62 at Boulder Creek Drive / Eden Drive North				★		★	\$94,800
762	1051	610086	NV	61	Hennepin	County Road 61 at Lake Street Extension				★		★	\$87,000
968	1052	1090010	NV	109	Hennepin	County Road 109 at Forestview Lane North				★		★	\$87,000
1133	1053	1560090	NV	156	Hennepin	County Road 156 at 54th Avenue North / Elm Grove Avenue				★		★	\$70,200
179	1054	80026	NV	8	Hennepin	County Road 8 at Welcome Avenue North					★	★	\$39,000
274	1055	120102	NV	12	Hennepin	County Road 12 at Valley Forge Lane North / Depue Drive				★		★	\$31,200
1147	1056	2020009	NV	202	Hennepin	County Road 202 at State Highway 610 Westbound Ramps				★		★	\$31,200
989	1057	1100054	NV	110	Hennepin	County Road 110 at Grandview Boulevard				★		★	\$23,400
353	1058	190116	NV	19	Hennepin	County Road 19 at CSAH 151 (West Branch Road)				★		★	\$23,400

Urban Intersection Project List for Hennepin County - PED/BIKE RELATED

List No.	Ped/Bike Rank	County ID	Description	Star Ranking	HAWK	Median Refuge Island	Curb Extension	Countdown Timers	Leading Ped Interval	RRFB w/ Refuge Island	RRFB	Upgrade Signal Head Hardware	Update Signal to Meet MUTCD Recommendation	Mini Roundabout	Upgrade Signs & Markings	Intersection Cost
124	62	30312	County Road 3 at 36th Avenue South	*****	0	0	4	0	1	0	0	1	0	0	0	\$70,000
856	63	810006	County Road 81 at Aldrich Avenue North	*****	0	4	0	0	1	0	0	1	0	0	0	\$78,000
685	64	520128	County Road 52 at State Highway 47 (University Avenue Northeast)	*****	0	0	0	1	0	0	0	1	0	0	0	\$107,000
111	65	30260	County Road 3 at 10th Avenue South	*****	0	0	4	1	0	0	0	1	0	0	0	\$52,000
695	66	520182	County Road 52 at Industrial Boulevard	*****	0	0	0	0	1	0	0	0	1	0	0	\$125,000
675	67	520092	County Road 52 at 2nd Street North	*****	0	4	0	1	0	0	0	1	0	0	0	\$60,000
681	68	520110	County Road 52 at State Highway 65 (Central Avenue Southeast / Central Avenue Northeast)	*****	0	0	0	1	0	0	0	0	1	0	0	\$107,000
147	70	50184	County Road 5 at Ottawa Avenue South	*****	0	0	0	0	1	0	0	1	0	0	0	\$30,000
145	71	50146	County Road 5 at Dakota Avenue South	*****	0	0	4	0	1	0	0	0	1	0	0	\$70,000
915	72	1010064	County Road 101 at CSAH 5 (Minnetonka Boulevard)	*****	0	0	0	0	1	0	0	0	1	0	0	\$125,000
693	73	520174	County Road 52 at Hoover Street Northeast / 25th Avenue Southeast	*****	0	0	0	1	0	0	0	1	0	0	0	\$12,000
709	74	530084	County Road 53 at 12th Avenue South	*****	0	0	0	0	1	0	0	1	0	0	0	\$30,000
657	75	520018	County Road 52 at 90th Street West / 90th Street East	*****	0	0	0	1	0	0	0	1	0	0	0	\$12,000
129	76	30340	County Road 3 at River Parkway West	*****	0	0	4	0	1	0	0	1	0	0	0	\$70,000
698	77	530008	County Road 53 at Vincent Avenue South	*****	0	0	0	0	1	0	0	0	1	0	0	\$30,000
691	78	520158	County Road 52 at 15th Avenue Southeast	*****	0	0	4	1	0	0	0	0	1	0	0	\$147,000
1120	79	1560004	County Road 156 at 10th Avenue North	*****	0	0	2	0	1	0	0	1	0	0	0	\$50,000
535	80	350050	County Road 35 at 31st Street East	*****	0	0	4	1	0	0	0	0	1	0	0	\$147,000
86	81	30177	County Road 3 at Whole Foods Market Entrance	*****	0	0	4	1	0	0	0	1	0	0	0	\$52,000
126	82	30324	County Road 3 at 42nd Avenue South	*****	0	0	4	0	1	0	0	1	0	0	0	\$70,000
907	83	1010016	County Road 101 at Hanud Road	*****	0	0	2	0	1	0	0	0	1	0	0	\$145,000
123	84	30306	County Road 3 at 33rd Avenue South	*****	0	0	4	0	1	0	0	1	0	0	0	\$70,000
835	85	700034	County Road 70 at Nevada Avenue North	*****	0	0	4	0	1	0	0	1	0	0	0	\$70,000
692	86	520164	County Road 52 at Taft Street Northeast	*****	0	0	0	1	0	0	0	1	0	0	0	\$12,000
910	87	1010034	County Road 101 at State Highway 7	*****	0	0	0	0	1	0	0	0	1	0	0	\$125,000
94	88	30204	County Road 3 at Hennepin Avenue	*****	0	0	0	0	1	0	0	1	0	0	0	\$30,000
579	89	370009	County Road 37 at 15th Avenue Southeast	*****	0	4	0	1	0	0	0	0	1	0	0	\$155,000
549	90	350126	County Road 35 at 64th Street East	*****	0	0	4	1	0	0	0	1	0	0	0	\$52,000
1063	91	1520148	County Road 152 at CSAH 81 (West Broadway Avenue) / CSAH 66 (West Broadway Avenue)	*****	0	0	0	1	0	0	0	0	1	0	0	\$107,000
99	92	30220	County Road 3 at CSAH 22 (Lyndale Avenue South)	*****	0	4	0	0	1	0	0	1	0	0	0	\$78,000
565	93	360001	County Road 36 at Golden View Drive	*****	0	0	0	1	0	0	0	1	0	0	0	\$12,000
583	94	370018	County Road 37 at 10th Avenue Southeast	*****	0	0	0	1	0	0	0	0	1	0	0	\$107,000
460	95	310031	County Road 31 at State Highway 62 Eastbound Ramps	*****	0	0	4	0	1	0	0	1	0	0	0	\$70,000
507	96	330068	County Road 33 at 7th Street South	*****	0	0	4	1	0	0	0	0	1	0	0	\$147,000
398	97	230018	County Road 23 at CSAH 66 (Broadway Street Northeast)	*****	0	0	0	0	1	0	0	1	0	0	0	\$30,000
530	98	350032	County Road 35 at CSAH 5 (Franklin Avenue East)	*****	0	0	0	1	0	0	0	0	1	0	0	\$107,000
1030	99	1520060	County Road 152 at 26th Street East	*****	0	0	0	1	0	0	0	0	1	0	0	\$107,000
109	100	30256	County Road 3 at Chicago Avenue	*****	0	4	0	1	0	0	0	1	0	0	0	\$60,000
645	101	480046	County Road 48 at CSAH 3 (Lake Street East)	*****	0	0	0	0	1	0	0	1	0	0	0	\$30,000
821	102	660092	County Road 66 at State Highway 47 (University Avenue Northeast)	*****	0	0	0	0	1	0	0	1	0	0	0	\$30,000
534	103	350048	County Road 35 at CSAH 3 (Lake Street East)	*****	0	0	0	1	0	0	0	0	1	0	0	\$107,000
318	104	170038	County Road 17 at American Boulevard West	*****	0	0	0	0	1	0	0	1	0	0	0	\$30,000
1107	105	1530064	County Road 153 at 2nd Street Northeast	*****	0	0	4	1	0	0	0	0	1	0	0	\$147,000
1020	106	1520026	County Road 152 at CSAH 42 (42nd Street East)	*****	0	0	0	0	1	0	0	0	1	0	0	\$125,000
566	107	360002	County Road 36 at 10th Avenue Southeast	*****	0	0	0	1	0	0	0	1	0	0	0	\$12,000
116	108	30286	County Road 3 at 21st Avenue South	*****	0	0	0	1	0	0	0	1	0	0	0	\$12,000
49	109	20030	County Road 2 at Plymouth Avenue North	*****	0	0	4	1	0	0	0	1	0	0	0	\$52,000
1101	110	1530032	County Road 153 at Fremont Avenue North	*****	0	0	2	0	1	0	0	0	1	0	0	\$145,000
1129	111	1560062	County Road 156 at CSAH 9 (42nd Avenue North)	*****	0	0	0	0	1	0	0	1	0	0	0	\$30,000
1113	112	1530106	County Road 153 at Johnson Street Northeast	*****	0	0	0	0	1	0	0	0	1	0	0	\$125,000
1132	113	1560080	County Road 156 at 49th Avenue North	*****	0	0	4	0	1	0	0	1	0	0	0	\$70,000
337	114	170088	County Road 17 at 54th Street West	*****	0	0	4	1	0	0	0	1	0	0	0	\$52,000
1029	115	1520056	County Road 152 at 28th Street East	*****	0	0	0	1	0	0	0	0	1	0	0	\$107,000
1111	116	1530086	County Road 153 at Monroe Street Northeast	*****	0	0	4	0	1	0	0	0	1	0	0	\$165,000
742	117	610024	County Road 61 at Prairie Center Drive	*****	0	0	0	0	1	0	0	1	0	0	0	\$30,000
156	118	50250	County Road 5 at 11th Avenue South	*****	0	0	0	1	0	0	0	1	0	0	0	\$12,000
1103	119	1530048	County Road 153 at Lyndale Avenue North	*****	0	0	2	0	1	0	0	1	0	0	0	\$50,000
498	120	330040	County Road 33 at 26th Street East	*****	0	0	0	0	1	0	0	0	1	0	0	\$125,000
1089	121	1520299	County Road 152 at 68th Avenue North	*****	0	0	0	0	1	0	0	0	1	0	0	\$30,000
261	122	120018	County Road 12 at 101st Avenue North	*****	0	0	2	0	1	0	0	1	0	0	0	\$50,000
820	123	660088	County Road 66 at 2nd Street Northeast	*****	0	0	4	0	1	0	0	1	0	0	0	\$70,000

DRAFT MAY 2018



Safe Routes to School

A plan to make walking and biking to school a safe, fun activity

**NORTHROP URBAN ENVIRONMENTAL
LEARNING CENTER**

Minneapolis Public Schools
Minneapolis, MN

mn DEPARTMENT OF
TRANSPORTATION



TABLE OF CONTENTS

01

INTRODUCTION + CONTEXT..... 4

The Vision.....8

Northrop Urban Environmental
Learning Center in Context.....9

02

PROGRAMS 10

Introduction to Programs.....11

03

INFRASTRUCTURE..... 18

Introduction to Infrastructure 19

Existing Issues and Conflicts20

04

HOW TO GET INVOLVED..... 28

Using this Plan29

A

APPENDICES..... 32

Appendix A. For More Information ...34

Appendix B. SRTS Facts for School
Communication35

Appendix C. Summary of
Planning Process.....38

Appendix D. Existing Conditions.....40

Appendix E. Student Residences.....44

Appendix F. Parent Survey45

Appendix G. Student Hand Tally59

Appendix H. Northrop Staff Survey...65

Appendix I. Engagement Summary...69

Appendix J. Infrastructure
Toolbox73

Appendix K. Bike Parking for
Schools 81

Appendix L. Maintenance
Planning.....83

Appendix M. Equity in
SRTS Planning84

Existing Issues and Conflicts

The section that follows highlights some of the major issues in the area surrounding Northrop. The photos and observations described below were made during the fall of 2017, when the Northrop SRTS team performed a walk assessment of the area surrounding the schools. A walk assessment allowed the team to experience the conditions faced by people who walk and bike in the area. More observations and recommendations to improve conditions can be found on the pages following this overview.



^ E 43RD ST & S 31ST AVE

43rd St and 31st Ave is the main intersection for families walking and biking to school from the north and west. The school posts student crossing guards and an adult volunteer at the intersection to assist students crossing to the main entrance of Northrop, but because of vehicle drop offs and busing, the long crossings can be challenging and uncomfortable. There is no stop sign controlling north and south traffic on 31st Ave, which can be confusing for drivers as they approach the intersection during arrival and dismissal.

v E 46TH ST & S 31ST AVE

School buses drop students in the area of 46th St and 31st Ave during Minnehaha Monday events. Additionally, when staff and students take field trips to the Creek, they frequently use this crossing. There is no marked crosswalk, the crossing distances are long, the curb ramp is aligned to the center line of 31st Ave, and the curb ramps are not compliant with ADA standards. The photo below shows this crossing.





^ E 42ND ST

A major barrier to traveling to and from Northrop on foot or by bike is the 42nd St corridor, which runs east-west one block north of campus. Though an on street bike lane is present along 42nd, high vehicle volumes and speeds along the corridor make the crossings uncomfortable for students and families.

E 42ND ST & S 28TH AVE >

The intersection in the photo on the right connects two major roadways in south Minneapolis. Many families attending Northrop live to the north and west of this intersection (see Appendix E for maps of locations of student residences). This crossing acts as both a gateway and barrier to safe and comfortable walking and biking to Northrop.





Intersection Opportunity
 Corridor Opportunity
 Primary Existing Walking or Biking Routes

Infrastructure Recommendations

	LOCATION	PROBLEM/ISSUE	POTENTIAL SOLUTION/RECOMMENDATION	ANTICIPATED OUTCOME	LEAD	PRIORITY
A	43rd St & 31st Ave	Drivers not anticipating people crossing through this intersection (primary school gateway); long crossing distances; uncomfortable motor vehicle volumes and multiple turning movements during arrival and dismissal; vehicles parked close to the marked crosswalks decreasing visibility; two-way stop control unexpected by motorists	Install curb extensions; install raised crosswalks/speed table or raise the entire intersection; install signage alerting drivers to slow during approach to grade change; install all-way stop; install forward stop bars	Slower vehicle speeds, higher yielding compliance by drivers, better visibility, more comfortable experience for people walking. Drivers in the area identify the intersection as a gateway to the school	City of Minneapolis	High
B	46th St & 31st Ave	Drivers not anticipating people crossing from 31st to Minnehaha Creek; crossings do not meet accessibility standards; intersection design encourages crossing outside of crosswalk to access the creek trails; frequently used crossing by Northrop classroom field trips and Minnehaha Mondays	Install curb extensions; install high visibility crosswalk on east crossing; install signage upstream of crossing to highlight it as an area where drivers should expect people; install ADA compliant curb ramps to align with crossings	Slower vehicle speeds, higher yielding compliance by drivers, better visibility, more comfortable experience for people walking	City of Minneapolis, Minneapolis Park & Recreation Board	High
C	43rd St & 28th Ave	Drivers not anticipating people crossing 28th Ave (primary access point to neighborhoods west of 28th Ave); crossings do not meet accessibility standards; long crossing distances	Install curb extensions; install high visibility crosswalk on south crossing; install signage upstream of crossing to highlight it as an area where drivers should expect people; install ADA compliant curb ramps	Slower vehicle speeds, higher yielding compliance by drivers, better visibility, more comfortable experience for people walking	City of Minneapolis	High
D	43rd St & Cedar Ave	Uncomfortable motor vehicle volumes and speeds on Cedar Ave; drivers not anticipating people crossing Cedar Ave (primary connection to access neighborhoods west of Cedar Ave); long crossing distances; vehicles parked close to the marked crosswalks decreasing visibility; crossings do not meet accessibility standards	Install curb extensions; install high visibility crosswalk on south crossing; install signage upstream of crossing to highlight it as an area where drivers should expect people; install activated flashing beacon; install ADA compliant curb ramps where absent	Slower vehicle speeds, higher yielding compliance by drivers, better visibility, more comfortable experience for people walking	Hennepin County, City of Minneapolis	High
E	42nd St & 31st Ave	Uncomfortable motor vehicle speeds on 42nd St; drivers not anticipating people crossing through this intersection (primary connection from school to neighborhoods north of 42nd St); long crossing distances	Install curb extensions; install high visibility crosswalk on east crossing; install signage upstream of crossing to highlight it as an area where drivers should expect people; install activated flashing beacon; install ADA compliant curb ramps where absent; install no parking zone at all times on 42nd St for a minimum of 30 feet upstream from the crossings	Slower vehicle speeds, higher yielding compliance by drivers, better visibility, more comfortable experience for people walking	Hennepin County, City of Minneapolis	High
F	42nd St & Nokomis Ave	Drivers not anticipating people biking and walking through this intersection; inconsistent driver compliance with existing stop control; long crossing distances;	Install curb extensions; install high visibility crosswalk on east crossing; install forward stop bars; install ADA compliant curb ramps where absent; install bicycle intersection crossing markings across 42nd St	Slower vehicle speeds, higher yielding compliance by drivers, better visibility of people riding on the Nokomis Bike Blvd; more comfortable experience for people walking and biking	Hennepin County, City of Minneapolis	High
G	43rd St & 32nd Ave	Drivers not anticipating people crossing through this intersection (frequently used connection to Community Garden); long crossing distances; vehicles parked close to the marked crosswalks decreasing visibility; two-way stop control unexpected by motorists	Install curb extensions; install high visibility crosswalk; install forward stop bars; install all-way stop	Slower vehicle speeds, higher yielding compliance by drivers, better visibility, more comfortable experience for people walking	City of Minneapolis	Medium
H	44th St & 31st Ave	Drivers not anticipating people crossing through this intersection; long crossing distances; vehicles parked close to the marked crosswalks decreasing visibility; two-way stop control unexpected by motorists	Install curb extensions; install forward stop bars; install all-way stop	Slower vehicle speeds, higher yielding compliance by drivers, better visibility, more comfortable experience for people walking	City of Minneapolis	Medium
I	43rd St & Nokomis Ave	Drivers not anticipating people crossing Nokomis Ave; long crossing distances; uncomfortable motor vehicle volumes and speeds on Nokomis Ave; vehicles parked close to the marked crosswalks decreasing visibility; crossings do not meet accessibility standards. This intersection previously had a police crossing guard and marked crosswalk.	Install curb extensions; install high visibility crosswalk; install forward stop bars; install ADA compliant curb ramps	Slower vehicle speeds, higher yielding compliance by drivers, better visibility, more comfortable experience for people walking	City of Minneapolis	Medium
J	42nd St & 32nd Ave	Uncomfortable motor vehicle speeds on 42nd St due to drivers speeding to cross Hiawatha Ave; drivers not anticipating people crossing through this intersection (connection to Community Garden); long crossing distances; crossings do not meet accessibility standards	Install curb extensions; install high visibility crosswalk on east crossing; install signage upstream of crossing to highlight it as an area where drivers should expect people; install ADA compliant curb ramps where absent	Slower vehicle speeds, higher yielding compliance by drivers, better visibility, more comfortable experience for people walking	Hennepin County, City of Minneapolis	Medium

Infrastructure Recommendations (continued)

	LOCATION	PROBLEM/ISSUE	POTENTIAL SOLUTION/RECOMMENDATION	ANTICIPATED OUTCOME	LEAD	PRIORITY
K	42nd St & 26th Ave	Uncomfortable motor vehicle speeds on 42nd St; drivers not anticipating people crossing through this intersection; long crossing distances; crossings do not meet accessibility standards	Install permanent median safety island; install curb extensions; install ADA compliant curb ramps; coordinate with SENA	Slower vehicle speeds, higher yielding compliance by drivers, better visibility, more comfortable experience for people walking	Hennepin County, City of Minneapolis	Medium
L	44th St & 32nd Ave	Drivers not anticipating people crossing through this intersection (primary connection to Northrop for St. Helena's students who share buses); long crossing distances; vehicles parked close to the marked crosswalks decreasing visibility; two-way stop control unexpected by motorists	Install curb extensions; install high visibility crosswalks; install forward stop bars; install all-way stop	Slower vehicle speeds, higher yielding compliance by drivers, better visibility, more comfortable experience for people walking	City of Minneapolis	Medium
M	42nd St & 21st Ave	Uncomfortable motor vehicle speeds on 42nd St; drivers not anticipating people crossing through this intersection; long crossing distances; crossings do not meet accessibility standards	Install permanent median safety island; install curb extensions; install ADA compliant curb ramps; coordinate with SENA	Slower vehicle speeds, higher yielding compliance by drivers, better visibility, more comfortable experience for people walking	Hennepin County, City of Minneapolis	Medium
N	42nd St & 28th Ave	Long crossing distances; long traffic signal cycle / wait time for people desiring to cross; drivers not anticipating people crossing; high vehicle speeds and volumes during commute hours	Install curb extensions; install leading pedestrian interval (LPI)	Increased visibility of pedestrians, less wait time for people walking; less jaywalking; more comfortable experience for people walking	Hennepin County, City of Minneapolis	Low
O	44th St & 28th Ave	Long traffic signal cycle / wait time for people desiring to cross 28th Ave and access Lake Hiawatha Park; current MPS recommended safe route across 28th Ave	Install curb extensions; install leading pedestrian interval (LPI)	Increased visibility of pedestrians, less wait time for people walking; less jaywalking; more comfortable experience for people walking	City of Minneapolis, Minneapolis Park and Recreation Board	Low
P	43rd St from Cedar Ave to 31st Ave	Drivers not anticipating people walking and biking to access the school campus along this primary east-west spine (this is the shortest, most direct route to neighborhoods west of Cedar Ave)	Consider traffic calming improvements along corridor including median safety islands, midblock neckdowns, curb extensions at intersections, bicycle boulevard/neighborhood greenway, etc.	Slower speeds and increased comfort for people walking and biking in the corridor	City of Minneapolis	Coordinate with Items A, C, D & I
Q	42nd St from 25th Ave to 34th Ave	Wide street cross section encourages drivers to move quickly; drivers not anticipating people walking and biking and crossing to access the school campus	Consider traffic calming improvements along corridor including median safety islands, midblock neckdowns, curb extensions at intersections, etc.	Slower speeds and increased comfort for people walking and biking in the corridor	Hennepin County	Coordinate with Items E, F, J, K & N



APPENDIX

FURTHER READING

For a complete list of infrastructure to increase bicyclist and pedestrian safety and comfort, turn to Appendix J. The toolkit found here will help you brainstorm additional improvements for the area surrounding Northrop.

County Roadway Safety Plan Updates

The Big Book of Ideas

Prepared for:
Hennepin County

Prepared by:
ch2m. Team

Version 1.1

List of Strategies

Rural Segments

- Centerline Rumble Strip
 - Sinusoidal Rumble “Mumble” Strips included
- Shoulder/Edgeline Rumble Strips
 - Sinusoidal Rumble “Mumble” Strips included
- Sinusoidal Rumble “Mumble” Strips
 - Centerline
 - Shoulder/Edgeline
- Safety Edge
- Enhanced Edgeline (6” & 8”)
- Shoulder Paving (2’, 4’, 6’)
- Clear Zone Maintenance/Enhancements
- Ditch/embankment Improvements
- Access Management & Corridor Studies

Rural Curves

- Chevrons
- Delineators
- High Friction Surface Treatment (HFST)
- Dynamic Curve Signing
- Clear Zone Maintenance/Enhancements
- Reconstruct [TT to a Single T intersection]
- Sight Line Improvement

Rural Intersections

- Streetlights (and approaches)
- Restricted Crossing U-Turn (RCUT) Intersection
- Roundabout
- Turn Lanes (Offset, Channelized)
- LED Stop Signs

- Remove Skew / Realign Intersections
- Retroreflective Borders on Traffic Signal Backplates

Urban Segments

- Road diet [3- & 5-Lane Conversions]
- ¾-Intersection
- Raised center median
- Access Management & Corridor Studies

Urban Intersections

- Confirmation Lights
-
- Center Island Medians
- Roundabout (including Mini Roundabout)
- Flashing Yellow Arrow (FYA)
- Turn Lanes (Offset, Channelized)
- Retroreflective Borders on Traffic Signal Backplates
- Signal Mast Arms
- Signal Coordination

Pedestrian and Bicycle

- Leading Pedestrian Intervals
- Curb Extensions
- Pedestrian crossing flasher
- High-Intensity Activated crossWalk Beacon (HAWK)APS
- Pedestrian Countdown Timers

Urban Intersections

Strategy	Crash Reduction Factor*	Typical Installation Costs
Confirmation Lights	25% to 84% reduction in violations	\$1,200 per two approaches
Leading Pedestrian Intervals	Up to 60% pedestrian/vehicle crashes	\$600 per intersection
Curb Extensions	Increase in vehicles yielding to pedestrians	\$36,000 per corner
Center Island Medians	46% in vehicle/pedestrian crashes	\$24,000 per approach
Roundabout (including Mini Roundabout)	20% to 50% all crashes/ 60% to 90% right-angle crashes	\$4,200,000 per intersection
Rectangular Rapid Flash Beacon (RRFB)	75% of drivers yield to pedestrians	\$15,000
High-Intensity Activated crossWalk Beacon (HAWK)	69% Vehicle/Pedestrian	\$50,000 to \$120,000
Flashing Yellow Arrow (FYA) --> Note: Permitted to FYA	19.4% left turn crashes	
Turn Lanes (Offset, Channelized)	27%	\$150,000 to \$500,000

Notes:

* - Crash reduction factors based on review of CMF Clearinghouse and other published research

^a – Virginia DOT Report: <https://www.railstotrails.org/resourcehandler.ashx?id=4063>



Confirmation Lights

Source: MnDOT 2015 Traffic Safety Fundamentals Handbook



Leading Pedestrian Interval

Source: <https://bikeuptowndotorg.files.wordpress.com/2012/04/2012-04-15-09-56-491.jpg>



Curb Extensions

Source: <http://www.fhwa.dot.gov/publications/research/safety/pedbike/05085/images/fig205.jpg>



Center Island Medians

Source: http://safety.fhwa.dot.gov/provencountermeasures/images/sa12_011.jpg



Roundabout

Source: Innovative Intersection Safety Improvement Strategies and Management Practices: A Domestic Scan (FHWA, FHWA-SA-06-016)



Michael Frederick, City of St. Petersburg, FL

Rectangular Rapid Flash Beacon

Source: <http://www.fhwa.dot.gov/publications/publicroads/11mayjun/images/do1.jpg>



HAWK

Source: http://www.fhwa.dot.gov/publications/research/safety/10045/images/hawk_027.jpg

Attachment D – Letters of Support

August 29, 2018

Ms. Carla Stueve, Director, County Engineer
Hennepin County Public Works
1600 Prairie Drive
Medina, MN 55340-5421

Dear Ms. Stueve:

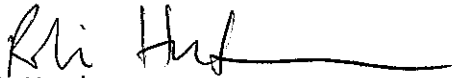
Hennepin County has requested a letter of support for a series of grant applications for MnDOT's Highway Safety Improvement Program (HSIP). The City of Minneapolis hereby expresses its support for the following Hennepin County projects:

- Lake Street (CSAH 3) at Cedar Avenue (CSAH 152), which will include a combination of various improvements such as (but not limited to): curb extensions, upgraded intersection lighting, and upgraded ADA accommodations.
- 42nd Street East (CSAH 42) at Cedar Avenue (CSAH 152), 21st Avenue South, 26th Avenue South, and Nokomis Avenue, which will include a combination of various improvements such as (but not limited to): raised medians, curb extensions, pavement markings, signing, and/or beacons.

We understand these improvements will be discussed and included where appropriate, as part of the County-City Operations and Maintenance Agreement.

Thank you for making us aware of this application effort and the opportunity to provide support. Minneapolis Public Works looks forward to working with you on these projects.

Sincerely,

A handwritten signature in black ink, appearing to read "Robin Hutcheson".

Robin Hutcheson
Director of Public Works
City of Minneapolis

Attachment E – MnDOT Crash Data (2006-2015)

CSAH 42 (42nd Street) at 26th Avenue in Minneapolis (2006 - 2015)

Crash data is managed by the Mn/DOT Office of Traffic, Safety, and Operations.

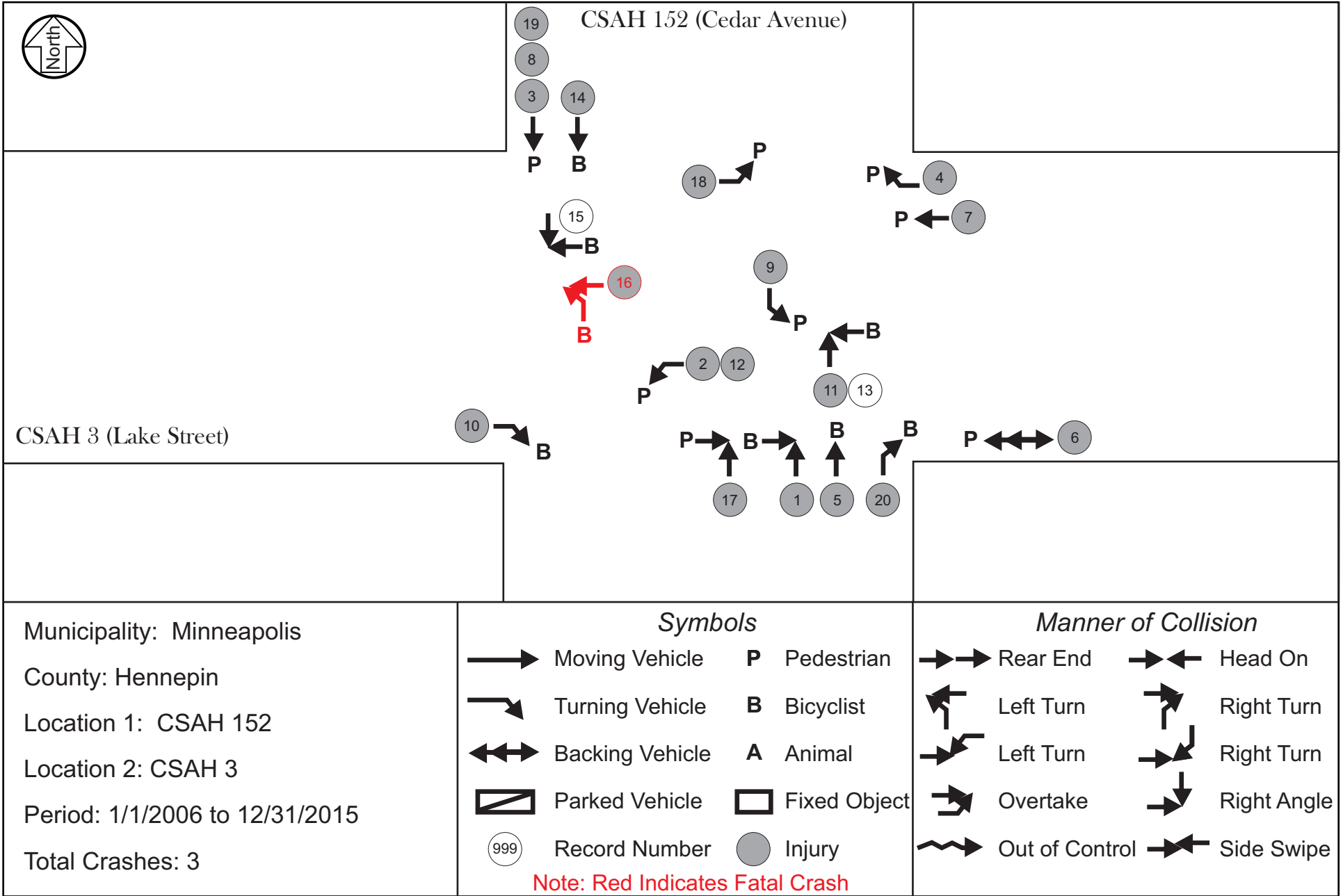
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083250197	04	27000042	1	Minneapolis	10/27/2008	1840	N	0	02	00	30	01	00	01	00	00	00	00	01	01	08	01	03	17	11	05	01	N	04	09	61	M	01	01	01	01	00	01	N	04	01	36	F
090900468	04	27000042	1	Minneapolis	03/31/2009	1834	N	0	01	04	30	12	07	01	98	01	01	00	01	01	08	04	03	01	01	00	01	N	99	01	39	M											
130280164	04	27000042	1	Minneapolis	01/28/2013	1335	C	0	01	04	30	06	09	01	04	01	01	00	03	01	08	32	01	06	15	00	01	N	04	01	55	M	53	05	90	01	00	25	N	98	01	43	M

CSAH 42 (42nd Street) @ Nokomis Avenue (2006 - 2015)

Crash data is managed by the Mn/DOT Office of Traffic, Safety, and Operations.

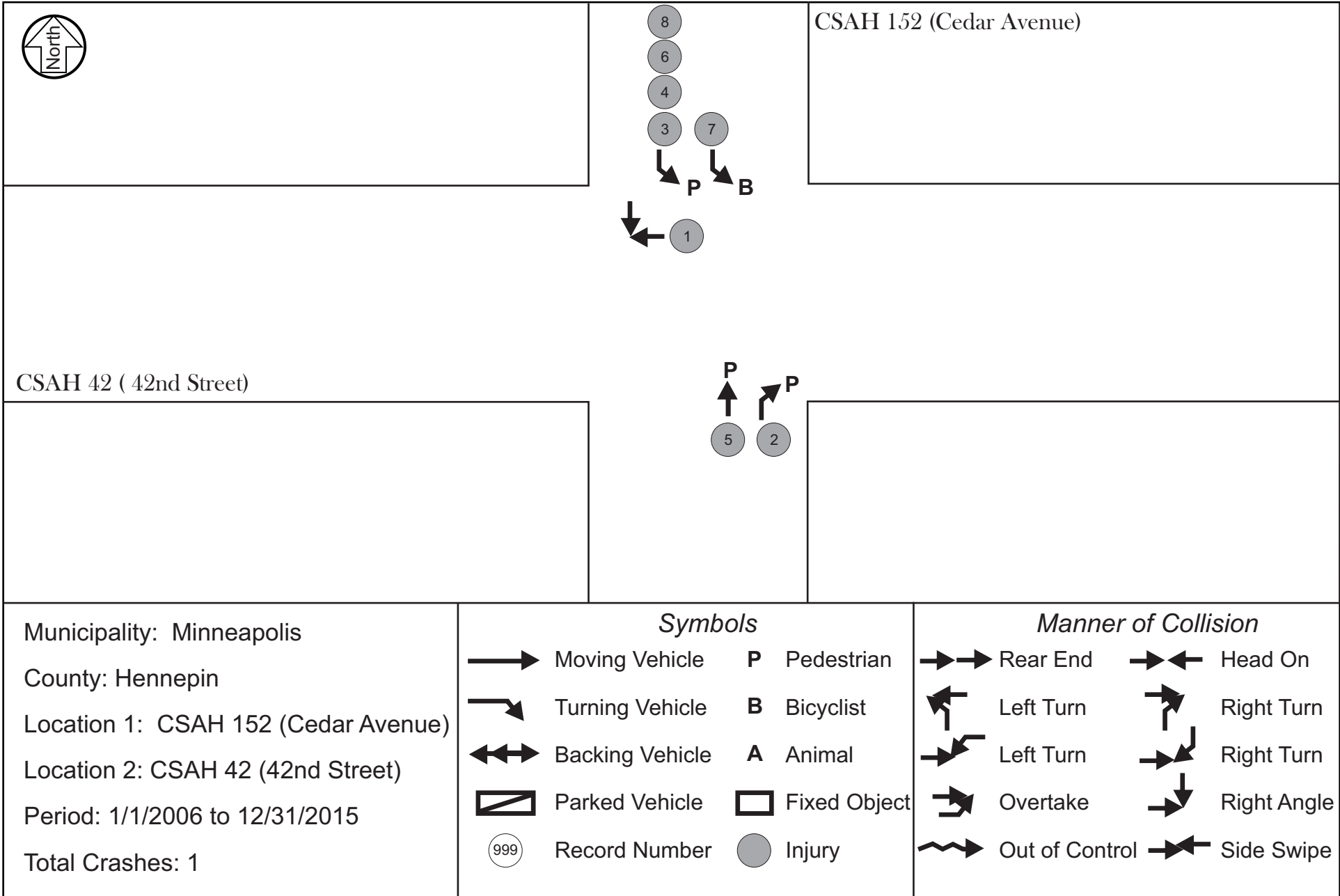
CRASH NUM	SYS	NUM	RELY	CITY	CRASH DATE	TIME	SEV	NUM KILLED	NUM VEH	JUNC	SL	CRASH TYPE	DIAG	LOC1	TCD	LIT	WTHR1	WTHR2	SURF	RD CHAR	RD DSGN	V1 VTYPE	V1 DIR	V1 ACT	V1 FAC1	V1 FAC2	P1 POSN	P1 INJ	P1 EQP	P1 PHYS	P1 AGE	P1 SEX	V2 VTYPE	V2 DIR	V2 ACT	V2 FAC1	V2 FAC2	P2 POSN	P2 INJ	P2 EQP	P2 PHYS	P2 AGE	P2 SEX
092790122	04	27000042	1	Minneapolis	10/06/2009	1345	N	0	02	07	30	01	01	01	03	01	03	00	02	01	08	04	03	01	15	61	01	N	04	01	31	F	02	03	01	01	00	01	N	04	01	40	M
061560230	04	27000042	1	Minneapolis	05/17/2006	1030	N	0	02	01	30	01	01	01	98	01	01	90	01	01	05	03	00	01	00	00	01	N	00	99	894	Z	01	03	01	01	00	01	N	99	01	20	F
062540255	04	27000042	1	Minneapolis	08/03/2006	2100	C	0	02	00	30	01	05	00	03	03	01	00	01	00	00	01	07	01	00	00	01	C	04	00	32	F	99	03	01	00	00	01	N	98	00	29	M
070860006	04	27000042	1	Minneapolis	03/26/2007	1750	C	0	02	04	30	01	01	01	98	01	01	00	01	01	08	01	07	01	04	03	01	N	98	99	895	Z	03	07	01	01	00	01	C	04	01	22	F
071030096	04	27000042	1	Minneapolis	03/28/2007	2005	N	0	03	04	30	01	03	01	03	04	02	03	02	01	08	01	05	05	02	00	01	N	99	99	895	Z	01	05	06	01	00	01	N	99	01	32	F
080430091	04	27000042	1	Minneapolis	10/24/2007	1545	N	0	02	00	30	01	05	00	03	01	01	00	01	00	00	01	01	01	00	00	01	N	04	00	48	F	03	07	01	00	00	01	N	00	00	64	M
090650104	04	27000042	1	Minneapolis	02/10/2009	1926	C	0	02	07	30	01	01	01	03	04	03	00	02	01	02	03	03	01	04	05	01	N	99	01	52	M	01	03	11	01	00	01	C	03	01	65	M
110320295	04	27000042	1	Minneapolis	12/30/2010	2045	N	0	02	00	30	01	05	00	03	04	05	00	02	00	00	03	07	01	00	00	01	N	04	00	66	F	02	05	01	00	00	01	N	00	00	37	M
121820111	04	27000042	1	Minneapolis	06/30/2012	1540	N	0	02	04	30	01	01	01	03	01	01	01	01	01	08	03	03	01	15	18	01	N	04	02	34	F	03	03	11	01	01	01	N	04	01	39	M
133020106	04	27000042	1	Minneapolis	09/25/2013	1945	N	0	02	00	25	01	05	00	03	01	01	00	01	00	00	01	01	01	00	00	01	N	04	00	57	F	02	07	32	00	00	01	N	00	00	56	M
142590034	04	27000042	1	Minneapolis	09/16/2014	0755	C	0	01	04	30	07	05	01	03	01	01	01	01	01	08	01	03	01	32	00	01	N	04	01	25	M	51	01	36	01	01	22	C	98	01	28	F
151160089	04	27000042	1	Minneapolis	04/26/2015	1901	C	0	01	04	30	06	90	01	03	01	01	00	01	01	08	01	07	01	05	00	01	N	99	01	20	M	53	98	01	01	00	25	C	98	01	54	F

Attachment F – Collision Diagrams



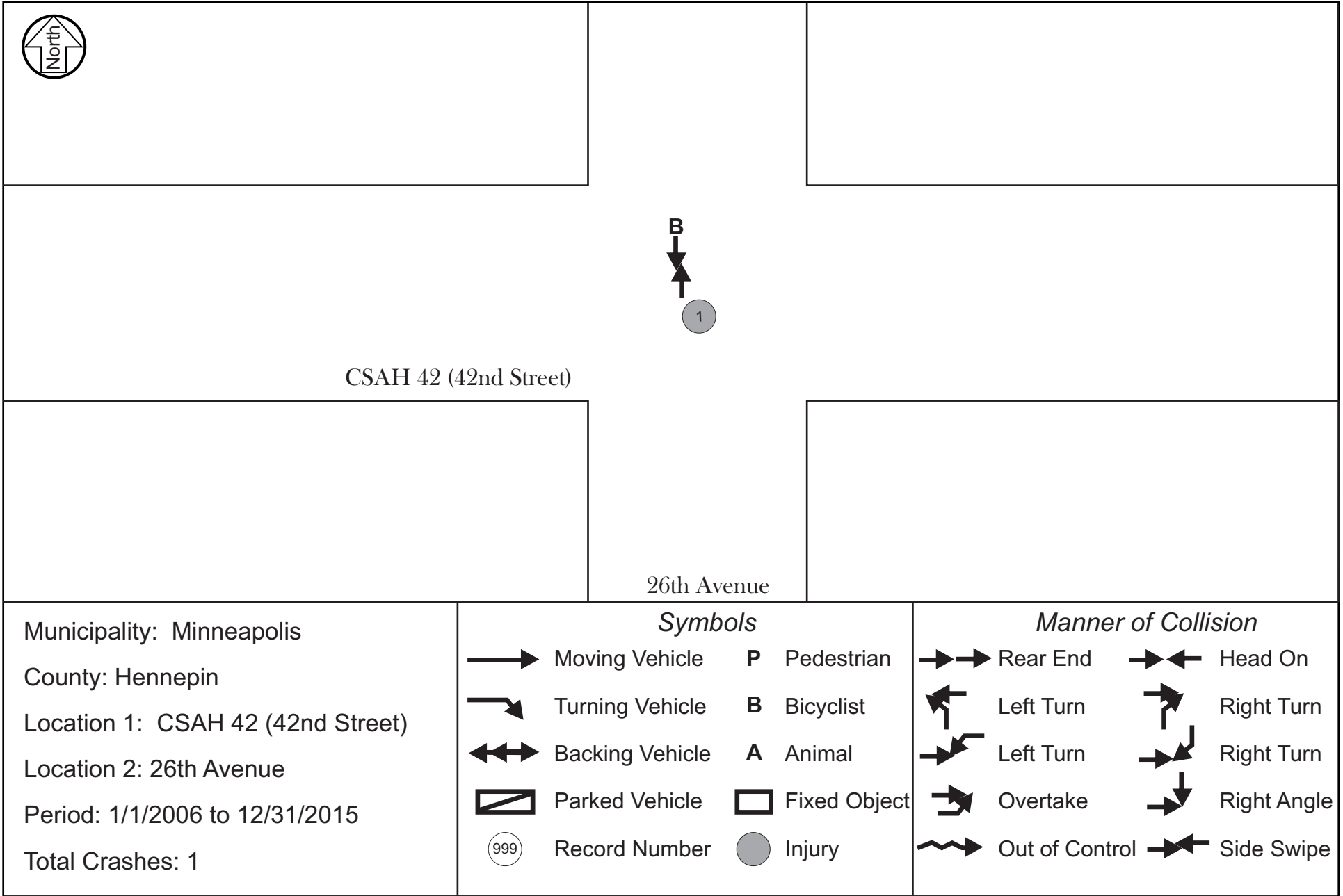
Collision Diagram (Pedestrian, Bicycle, and Severe Crashes)

CSAH 152 (Cedar Avenue) & CSAH 3 (Lake Street) Intersection
 Hennepin County, Minnesota



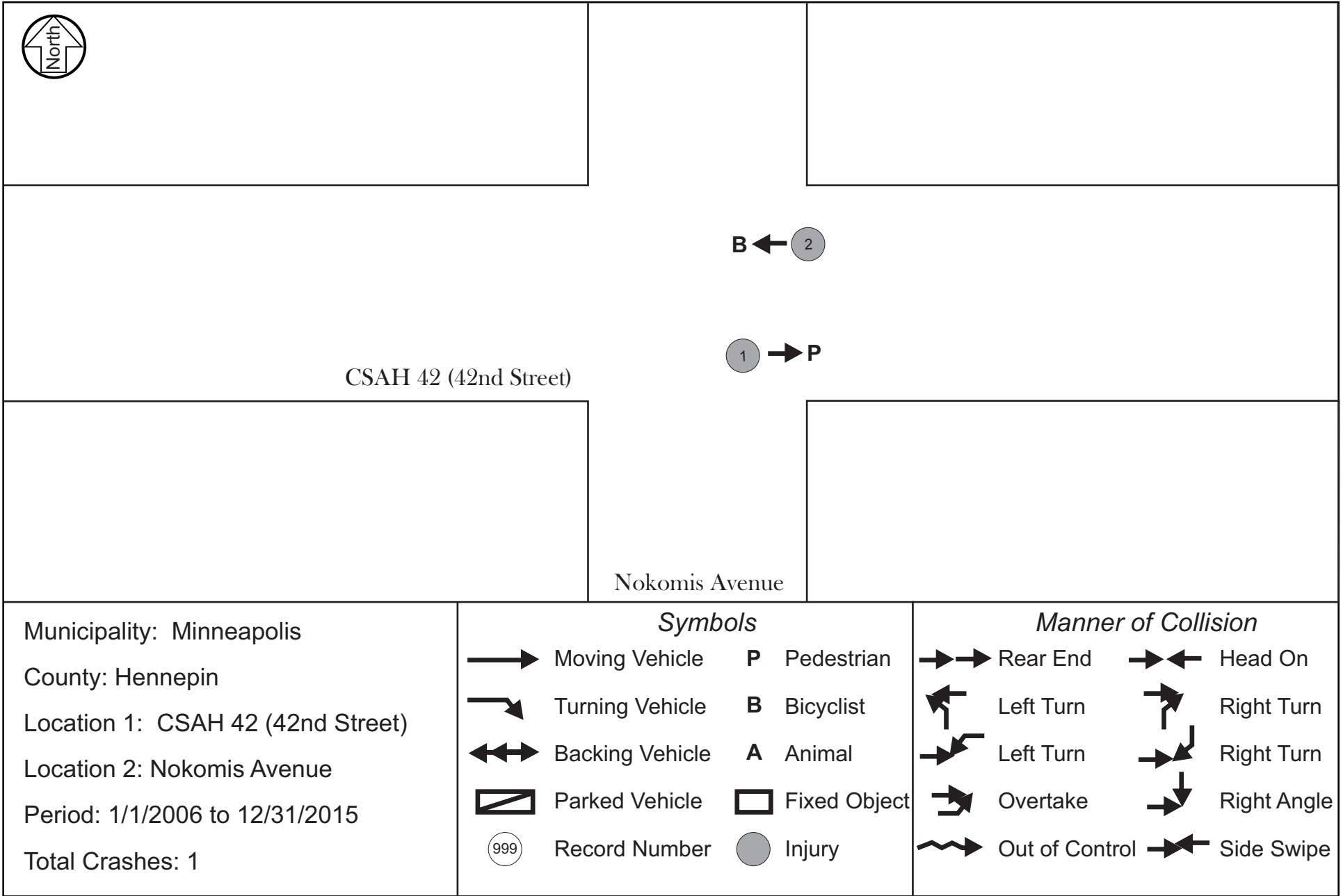
Collision Diagram (Pedestrian, Bicycle, and Severe Crashes)

CSAH 152 (Cedar Avenue) & CSAH 42 (42nd Street) Intersection
 Hennepin County, Minnesota



Collision Diagram (Pedestrian, Bicycle, and Severe Crashes)

CSAH 42 (42nd Street) and 26th Avenue
Hennepin County, Minnesota



Collision Diagram (Pedestrian, Bicycle, and Severe Crashes)

CSAH 42 (42nd Street) and Nokomis Avenue
 Hennepin County, Minnesota

Attachment G – Documentation of CRFs

Countermeasures	Crash Type	Crash Severity	Area Type	Ref	Obs	Effectiveness				Study Type
						Crash Reduction Factor / Function	Std Error	Range		
								Low	High	
GEOMETRIC COUNTERMEASURES										
Convert unsignalized intersection to roundabout	Pedestrian	Fatal/Injury	Urban	11		27	12	44	3	
Convert intersection to roundabout	Pedestrian	All		55		89				
Install pedestrian overpass/underpass	Pedestrian	All		15		86				
	Pedestrian	All		1	14	90		60	95	
	Pedestrian	Fatal/Injury		15		90				
	Pedestrian	PDO		15		90				
	Pedestrian	All		15		100				
	Pedestrian	All		15		67				
	Pedestrian	All		15		5				
Pedestrian	All		15		90					
Install pedestrian overpass/underpass (unsignalized intersection)	Pedestrian	All		28		13				
Install raised median	Pedestrian	All		15		25				
Install raised median (marked crosswalk) at unsignalized intersection	Pedestrian	All		60		46				
Install raised median (unmarked crosswalk) at unsignalized intersection	Pedestrian	All		60		39				
Install raised median (unsignalized intersection)	Pedestrian	All		28		69				
Install raised pedestrian crossing	All	All		5		30	67			Meta-analysis
	All	Fatal/Injury		5		36	54			Meta-analysis
	Pedestrian	All		28		8				
Install refuge islands	Pedestrian	All		28		56				
Install sidewalk (to avoid walking along roadway)	Pedestrian	All		15		74				
	Pedestrian	All		36		88		43	99	Case-Control Study

Desktop Reference for Crash Reduction Factors

Intersection Crashes

Countermeasure(s)	Crash Type	Crash Severity	Area Type	Config	Control	Major	Minor	Ref	Obs	Effectiveness				Study Type
						Daily Traffic				Crash Reduction Factor / Function	Std Error	Range		
						Volume (veh/day)						Low	High	
Install pedestrian crossing (signed and marked with curb ramps and extensions)	All	All			No signal			28		37		25	48	
Install pedestrian overpass/underpass	Ped	All			No signal			28		13				
Install stop signs at alternate intersections in residential areas	All	All	Urban		Stop			53		50		45	55	
	All	Fatal/Injury	Urban		Stop			53		67		61	72	
Vary frequency of driveways within 250 ft of intersection	All	All	Rural		Signal			6		100(1-EXP(0.046(Nd-3))); Nd=number of driveways on the major road within 250ft of the intersection				
	All	All	Rural		Stop			6		100(1-EXP(0.056(Nd-3))); Nd=number of driveways on the major road within 250ft of the intersection				
Vary lane width	All	All	Urban		Signal			6		100(1-EXP(-0.053(WI-12))); WI=lane width (ft)				
	All	All	Urban		Stop			6		100(1-EXP(-0.057(WI-12))); WI=lane width (ft)				
Vary sight distance	All	All	Rural		Signal			6		0				
Vary through lanes	All	All	Rural		Signal			6		100(1-EXP(0.007(NIn-2))); NIn=number of through lanes on the road				
	All	All	Rural		Stop			6		100(1-EXP(-0.093(NIn-2))); NIn=number of through lanes on the road				
Vary truck presence	All	All	Rural	4-Leg	Signal			6		100(1-EXP(0.026(Pt-9))); Pt=percent truck during the peak hour (average for all intersection movements)				
	All	Fatal/Injury	Rural	3-Leg	Stop			6		100(1-EXP(-0.0253(Pt-9))); Pt=percent truck during the peak hour (average for all intersection movements)				

▼ Countermeasure: Install pedestrian countdown timer

Compare	CMF	CRF(%)	Quality	Crash Type	Crash Severity	Area Type	Reference	Comments
<input type="checkbox"/>	0.3	70	★★★★★	Vehicle/pedestrian	All	Not specified	Van Houten et al., 2012	The study did not adjust ... [read more]
<input type="checkbox"/>	0.85	15	★★★★★	Other	All	Not specified	Kwigizile et al., 2016	CMFs of crashes involve drivers ... [read more]
<input type="checkbox"/>	0.48	52	★★★★★	Other	K,A,B,C	Not specified	Kwigizile et al., 2016	CMFs of crashes involve drivers ... [read more]
<input type="checkbox"/>	0.45	55	★★★★★	Vehicle/pedestrian	All	Not specified	Van Houten et al., 2012	The study did not adjust ... [read more]

[Compare](#) [Reset Compare](#)

*NOTE: You can compare CMFs across countermeasures, subcategories, and categories.