Application

13862 - 2020 Roadway Spot Mobility

14067 - CSAH 3 Hi/Lake Interchange Safety Improvements

Regional Solicitation - Roadways Including Multimodal Elements

Status:	Submitted
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What Grant Programs are you most interested in?	Regional Solicitation - Bicycle and Pedestrian Facilities			

Organization Information

Name:	HENNEPIN COUNTY
Jurisdictional Agency (if different):	

Organization Type:	County Government
Organization Website:	
Address:	DPT OF PUBLIC WORKS
	1600 PRAIRIE DR
*	MEDINA (City) / Minnesota (State/Province) / 55340 (Postal Code/Zip)
County:	Hennepin
Phone:*	763-745-7600 Ext.
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PeopleSoft Vendor Number	0000028004A9

Project Information

Project Name	Hi/Lake Safety Project
Primary County where the Project is Located	Hennepin
Cities or Townships where the Project is Located:	Minneapolis
Jurisdictional Agency (If Different than the Applicant):	

This project will improve safety and connectivity at the Hiawatha Ave (TH 55) and Lake St (CSAH 3) interchange between Snelling Ave and 22nd Ave in Minneapolis in coordination with MnDOT's 2022 rehabilitation of Hiawatha and associated bridges. Hiawatha Ave is a principal arterial and Lake St is an A-minor augmenter. The current design of the interchange is a Single Point Urban Interchange (SPUI). While effective in minimizing vehicle delay, this interchange is a barrier for nonmotorized users. The Hi/Lake SPUI is unique as pedestrians are permitted to cross the arterial street; however, the crossings are uncomfortable and indirect. Through this project, the geometry of the interchange will be converted to a tight-diamond design. Channelized turn lanes will be revised to reduce vehicle speed and provide direct crossing routes, and lighting upgrades will improve visibility, comfort and security.

Brief Project Description (Include location, road name/functional class, type of improvement, etc.)

Lake St is a four-lane, two-way roadway, with left and right turn lanes at the interchange and a speed limit of 30 mph. Medians divide Lake St, though they are not wide enough for pedestrian refuge. The Hiawatha Ave Bridge runs over Lake St along with the Blue Line LRT. Hiawatha Ave is a four-lane median separated 40 mph highway with high speed freeway-type ramps that develop into turn lanes as they intersect with Lake St. The wide intersection design is confusing for drivers as they try to negotiate their vehicles thru the intersection and align with the proper lanes. Despite a poor environment for people biking and walking, there are approximately 860-1,360 pedestrians and 190-200 bicyclists per day along this corridor (source: City of Minneapolis). The number of nonmotorized users traversing the corridor is expected to increase given nearby transit-oriented development and community service organizations. A trail was recently completed on the east side of Hiawatha

Ave to connect to the Midtown Greenway and a trail connection on the west side has been identified as a potential future improvement.

In 2016, phase 1 of the Hi-Lake Interchange study was completed, followed by phase 2 in 2019. This project reflects the goals of the study, including:

-Improve pedestrian and bicyclist comfort, safety and security; minimize crossing delay

-Ensure roadway configuration supports and facilitates efficient transit operations

-Expand sidewalk space where feasible to accommodate future transit infrastructure (BRT along Lake St)

-Create a dedicated connection between bike trails and the LRT station

-Improve geometrics of the interchange to provide better vehicular guidance and sight lines

The conversion of the interchange to a more traditional configuration will improve connections for nonmotorized users and remove ambiguity for people driving.

See attachments 1-4.

(Limit 2,800 characters; approximately 400 words)

TRANSPORTATION IMPROVEMENT PROGRAM (TIP) DESCRIPTION - will be used in TIP if the project is selected for funding. See MnDOT's TIP description guidance.

TIP description: Lake St (CSAH 3) from 22nd Ave S to Snelling Ave; reconstruct and realign sidewalk, improve crossings, reconfigure lanes, remove free-right turns, construct pedestrian refuge medians, ADA, upgrade signals

Project Length (Miles)

0.2

to the nearest one-tenth of a mile

Project Funding

Are you applying for competitive funds from another source(s) to implement this project? No

If yes, please identify the source(s)

Federal Amount $3,500,000.00

Match Amount $2,159,400.00

Minimum of 20% of project total

Project Total $5,659,400.00

For transit projects, the total cost for the application is total cost minus fare revenues.

Match Percentage 38.16%

Minimum of 20%
Compute the match percentage by dividing the match amount by the project total

Source of Match Funds Hennepin County

A minimum of 20% of the total project cost must come from non-federal sources; additional match funds over the 20% minimum can come from other federal sources

Preferred Program Year

Select one: 2024

Select 2022 or 2023 for TDM projects only. For all other applications, select 2024 or 2025.

Additional Program Years:

Select all years that are feasible if funding in an earlier year becomes available.

Project Information: Roadway Projects

County, City, or Lead Agency Hennepin County

Functional Class of Road A-minor augmenter

Road System CSAH 3 and TH 55

TH, CSAH, MSAS, CO. RD., TWP. RD., CITY STREET

Road/Route No. 3

i.e., 53 for CSAH 53

Name of Road Lake St and Hiawatha Ave

Example; 1st ST., MAIN AVE

Zip Code where Majority of Work is Being Performed 55406

(Approximate) Begin Construction Date 07/10/2023

(Approximate) End Construction Date 10/31/2024

TERMINI:(Termini listed must be within 0.3 miles of any work)

From: **(Intersection or Address)**	22nd Ave S
To: **(Intersection or Address)** *DO NOT INCLUDE LEGAL DESCRIPTION*	Snelling Ave
Or At	
Miles of Sidewalk (nearest 0.1 miles)	0.2
Miles of Trail (nearest 0.1 miles)	0.1
Miles of Trail on the Regional Bicycle Transportation Network (nearest 0.1 miles)	0.1
Primary Types of Work *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.*	widen sidewalk, crossing improvements, signal upgrades, ADA, lane reconfiguration

BRIDGE/CULVERT PROJECTS (IF APPLICABLE)

Old Bridge/Culvert No.:	
New Bridge/Culvert No.:	
Structure is Over/Under (Bridge or culvert name):	

Requirements - All Projects

All Projects

1.The project must be consistent with the goals and policies in these adopted regional plans: Thrive MSP 2040 (2014), the 2040 Transportation Policy Plan (2018), the 2040 Regional Parks Policy Plan (2018), and the 2040 Water Resources Policy Plan (2015).

Check the box to indicate that the project meets this requirement. Yes

2.The project must be consistent with the 2040 Transportation Policy Plan. Reference the 2040 Transportation Plan goals, objectives, and strategies that relate to the project.

Briefly list the goals, objectives, strategies, and associated pages:

Goal A: Transportation System Stewardship

Objectives: Efficiently preserve and maintain the regional transportation system in a state of good repair; operate the regional transportation system to efficiently and cost-effectively connect people and freight to destinations.

Strategies: A1, A2

Page 2.6

Goal B: Safety and security

Objectives: Reduce crashes and improve safety and security for all modes of passenger travel and freight transport.

Strategies: B1, B3, B4, B6

Page 2.7

Goal C: Access to destinations:

Objectives: Increase the availability of multimodal travel options, especially in congested highway corridors; increase transit ridership and the share of trips taken using transit, bicycling and walking; improve multimodal travel options for people of all ages and abilities to connect to jobs and other opportunities, particularly for historically under-represented populations.

Strategies: C1, C2, C4, C9, C10, C11, C15, C16, C17

Pages 2.8 - 2.11

Goal D: Competitive economy

Objectives: Improve multimodal access to regional job concentrations identified in Thrive MSP 2040; Invest in a multimodal transportation system to attract and retain businesses and residents

Strategies: D1, D3, D4

Pages 2.11 - 2.12

Goal E: Healthy environment

Objectives: Reduce transportation-related air emissions; Increase the availability and attractiveness of transit, bicycling and walking to encourage healthy communities and active car-free lifestyles; provide a transportation system that promotes community cohesion and connectivity for people of all ages and abilities, particularly for historically under-represented populations

Strategies: E1, E3, E4, E5, E6, E7

Pages 2.12-2.13

Goal F: Leveraging transportation investments to guide land use

Objectives: Encourage local land use design that integrates highways, streets, transit, walking and bicycling

Strategies: F2, F6

Page 2.14 - 2.16

Limit 2,800 characters, approximately 400 words

3.The project or the transportation problem/need that the project addresses must be in a local planning or programming document. Reference the name of the appropriate comprehensive plan, regional/statewide plan, capital improvement program, corridor study document [studies on trunk highway must be approved by the Minnesota Department of Transportation and the Metropolitan Council], or other official plan or program of the applicant agency [includes Safe Routes to School Plans] that the project is included in and/or a transportation problem/need that the project addresses.

List the applicable documents and pages:

1. Hennepin County Pedestrian Plan (2013)

Pages: 8, 52 (goals and priority locations map)

See attachment 5.

2. Draft Transportation Action Plan (City of Minneapolis, 2020)

Page 40: Walking chapter, including Pedestrian Priority Network map (page 41)

Page 63: All ages and abilities network map

Page 90: Transit priority projects map

Page 95: 5- and 10 minute walksheds to existing high frequency transit

See attachment 6.

3. Vision Zero Action Plan (Minneapolis, 2019)

Page 16: High Injury Streets map

Page 17: Strategy 2: make cost-effective safety improvements systematically and rapidly on High Injury Streets

See attachment 6.

4. Pedestrian Crash Study (Minneapolis, 2017)

Page 28: Figure 5-7 Pedestrian Crash Density

Page 32: Figure 5-15 Pedestrian crashes and sidewalk gaps

Page 96: Crashes at state highway intersections

See attachment 6.

5. Hennepin County 2020-2024 CIP

Pages 148-149 (provisional projects)

See attachment 7.

6. Hi-Lake Interchange Study, phase 1 (Hennepin County, 2016)

Entire document

See attachment 8.

7. Hi-Lake Phase 2 Final Report (Hennepin County, 2019)

Entire document

See attachment 9.

Limit 2,800 characters, approximately 400 words

4.The project must exclude costs for studies, preliminary engineering, design, or construction engineering. Right-of-way costs are only eligible as part of transit stations/stops, transit terminals, park-and-ride facilities, or pool-and-ride lots. Noise barriers, drainage projects, fences, landscaping, etc., are not eligible for funding as a standalone project, but can be included as part of the larger submitted project, which is otherwise eligible.

Check the box to indicate that the project meets this requirement. Yes

5.Applicants that are not State Aid cities or counties in the seven-county metro area with populations over 5,000 must contact the MnDOT Metro State Aid Office prior to submitting their application to determine if a public agency sponsor is required.

Check the box to indicate that the project meets this requirement. Yes

6.Applicants must not submit an application for the same project elements in more than one funding application category.

Check the box to indicate that the project meets this requirement. Yes

7.The requested funding amount must be more than or equal to the minimum award and less than or equal to the maximum award. The cost of preparing a project for funding authorization can be substantial. For that reason, minimum federal amounts apply. Other federal funds may be combined with the requested funds for projects exceeding the maximum award, but the source(s) must be identified in the application. Funding amounts by application category are listed below.
Strategic Capacity (Roadway Expansion): *$1,000,000 to $10,000,000*
Roadway Reconstruction/Modernization: *$1,000,000 to $7,000,000*
Traffic Management Technologies (Roadway System Management): *$250,000 to $3,500,000*
Spot Mobility and Safety: *$1,000,000 to $3,500,000*
Bridges Rehabilitation/Replacement: *$1,000,000 to $7,000,000*

Check the box to indicate that the project meets this requirement. Yes

8.The project must comply with the Americans with Disabilities Act (ADA).

Check the box to indicate that the project meets this requirement. Yes

9.In order for a selected project to be included in the Transportation Improvement Program (TIP) and approved by USDOT, the public agency sponsor must either have a current Americans with Disabilities Act (ADA) self-evaluation or transition plan that covers the public right of way/transportation, as required under Title II of the ADA. The plan must be completed by the local agency before the Regional Solicitation application deadline. For the 2022 Regional Solicitation funding cycle, this requirement may include that the plan is updated within the past five years.

The applicant is a public agency that employs 50 or more people and has a completed ADA transition plan that covers the public right of way/transportation. Yes

Date plan completed: 08/31/2015

Link to plan: https://www.hennepin.us/-/media/hennepinus/residents/transportation/documents/ada-sidewalk-transition-plan.pdf

The applicant is a public agency that employs fewer than 50 people and has a completed ADA self-evaluation that covers the public right of way/transportation.

Date self-evaluation completed:

Link to plan:

Upload plan or self-evaluation if there is no link

Upload as PDF

10.The project must be accessible and open to the general public.

Check the box to indicate that the project meets this requirement. Yes

11.The owner/operator of the facility must operate and maintain the project year-round for the useful life of the improvement, per FHWA direction established 8/27/2008 and updated 6/27/2017.

Check the box to indicate that the project meets this requirement. Yes

12.The project must represent a permanent improvement with independent utility. The term independent utility means the project provides benefits described in the application by itself and does not depend on any construction elements of the project being funded from other sources outside the regional solicitation, excluding the required non-federal match. Projects that include traffic management or transit operating funds as part of a construction project are exempt from this policy.

Check the box to indicate that the project meets this requirement. Yes

13.The project must not be a temporary construction project. A temporary construction project is defined as work that must be replaced within five years and is ineligible for funding. The project must also not be staged construction where the project will be replaced as part of future stages. Staged construction is eligible for funding as long as future stages build on, rather than replace, previous work.

Check the box to indicate that the project meets this requirement. Yes

14.The project applicant must send written notification regarding the proposed project to all affected state and local units of government prior to submitting the application.

Check the box to indicate that the project meets this requirement. Yes

Roadways Including Multimodal Elements

1.All roadway and bridge projects must be identified as a principal arterial (non-freeway facilities only) or A-minor arterial as shown on the latest TAB approved roadway functional classification map.

Check the box to indicate that the project meets this requirement. Yes

Roadway Expansion and Reconstruction/Modernization and Spot Mobility projects only:

2.The project must be designed to meet 10-ton load limit standards.

Check the box to indicate that the project meets this requirement. Yes

Bridge Rehabilitation/Replacement and Strategic Capacity projects only:

3.Projects requiring a grade-separated crossing of a principal arterial freeway must be limited to the federal share of those project costs identified as local (non-MnDOT) cost responsibility using MnDOTs Cost Participation for Cooperative Construction Projects and Maintenance Responsibilities manual. In the case of a federally funded trunk highway project, the policy guidelines should be read as if the funded trunk highway route is under local jurisdiction.

Check the box to indicate that the project meets this requirement.

4.The bridge must carry vehicular traffic. Bridges can carry traffic from multiple modes. However, bridges that are exclusively for bicycle or pedestrian traffic must apply under one of the Bicycle and Pedestrian Facilities application categories. Rail-only bridges are ineligible for funding.

Check the box to indicate that the project meets this requirement.

Bridge Rehabilitation/Replacement projects only:

5.The length of the bridge must equal or exceed 20 feet.

Check the box to indicate that the project meets this requirement.

6. The bridge must have a National Bridge Inventory Rating of 6 or less for rehabilitation projects and 4 or less for replacement projects.

Check the box to indicate that the project meets this requirement.

Roadway Expansion, Reconstruction/Modernization, and Bridge Rehabilitation/Replacement projects only:

7. All roadway projects that involve the construction of a new/expanded interchange or new interchange ramps must have approval by the Metropolitan Council/MnDOT Interchange Planning Review Committee prior to application submittal. Please contact Michael Corbett at MnDOT (Michael.J.Corbett@state.mn.us or 651-234-7793) to determine whether your project needs to go through this process as described in Appendix F of the 2040 Transportation Policy Plan.

Check the box to indicate that the project meets this requirement. Yes

Requirements - Roadways Including Multimodal Elements

Specific Roadway Elements

CONSTRUCTION PROJECT ELEMENTS/COST ESTIMATES	Cost

Mobilization (approx. 5% of total cost)	$216,000.00
Removals (approx. 5% of total cost)	$232,000.00
Roadway (grading, borrow, etc.)	$353,000.00
Roadway (aggregates and paving)	$624,000.00
Subgrade Correction (muck)	$0.00
Storm Sewer	$451,000.00
Ponds	$0.00
Concrete Items (curb & gutter, sidewalks, median barriers)	$141,000.00
Traffic Control	$360,000.00
Striping	$19,000.00
Signing	$11,000.00
Lighting	$0.00
Turf - Erosion & Landscaping	$226,000.00
Bridge	$0.00
Retaining Walls	$0.00
Noise Wall (not calculated in cost effectiveness measure)	$0.00
Traffic Signals	$980,000.00
Wetland Mitigation	$0.00
Other Natural and Cultural Resource Protection	$0.00
RR Crossing	$0.00
Roadway Contingencies	$1,098,400.00
Other Roadway Elements	$50,000.00
Totals	**$4,761,400.00**

Specific Bicycle and Pedestrian Elements

CONSTRUCTION PROJECT ELEMENTS/COST ESTIMATES	**Cost**
Path/Trail Construction	$0.00
Sidewalk Construction	$210,000.00
On-Street Bicycle Facility Construction	$0.00
Right-of-Way	$0.00
Pedestrian Curb Ramps (ADA)	$95,000.00
Crossing Aids (e.g., Audible Pedestrian Signals, HAWK)	$30,000.00
Pedestrian-scale Lighting	$100,000.00
Streetscaping	$226,000.00

Wayfinding	$0.00
Bicycle and Pedestrian Contingencies	$207,000.00
Other Bicycle and Pedestrian Elements	$30,000.00
Totals	**$898,000.00**

Specific Transit and TDM Elements

CONSTRUCTION PROJECT ELEMENTS/COST ESTIMATES	Cost
Fixed Guideway Elements	$0.00
Stations, Stops, and Terminals	$0.00
Support Facilities	$0.00
Transit Systems (e.g. communications, signals, controls, fare collection, etc.)	$0.00
Vehicles	$0.00
Contingencies	$0.00
Right-of-Way	$0.00
Other Transit and TDM Elements	$0.00
Totals	**$0.00**

Transit Operating Costs

Number of Platform hours	0
Cost Per Platform hour (full loaded Cost)	$0.00
Subtotal	$0.00
Other Costs - Administration, Overhead,etc.	$0.00

Totals

Total Cost	$5,659,400.00
Construction Cost Total	$5,659,400.00
Transit Operating Cost Total	$0.00

Congestion within Project Area:

Free-Flow Travel Speed:	17

The free-flow travel speed is the black number

Peak Hour Travel Speed: 11

The peak hour travel speed is the red number

Percentage Decrease in Travel Speed in Peak Hour Compared to Free-Flow (calculation): 35.29%

Upload the "Level of Congestion" map: 1589476512607_Attachment 10 - Lake St level of congestion map.pdf

Congestion on adjacent Parallel Routes:

Adjacent Parallel Corridor Franklin Avenue E

Adjacent Parallel Corridor Start and End Points:

Start Point: 16th Ave S

End Point: Minnehaha Ave

Free-Flow Travel Speed: 26

The Free-Flow Travel Speed is black number.

Peak Hour Travel Speed: 13

The Peak-Hour Travel Speed is red number.

Percentage Decrease in Travel Speed in Peak Hour Compared to Free-Flow (calculation): 50.0%

Upload the "Level of Congestion" map: 1589476512594_Attachment 11 - Franklin Ave level of congestion map.pdf

Principal Arterial Intersection Conversion Study:

Proposed at-grade project that reduces delay at a High Priority Intersection:

(100 Points)

Proposed at-grade project that reduces delay at a Medium Priority Intersection:

(90 Points)

Proposed at-grade project that reduces delay at a Low Priority Intersection:

(80 Points)

Not listed as a priority in the study: Yes

(0 Points)

Congestion Management and Safety Plan IV:

Proposed at-grade project that reduces delay at a CMSP opportunity area:

(100 Points)

Not listed as a CMSP priority location:	Yes
(0 Points)	

Measure C: Current Heavy Commercial Traffic

RESPONSE: Select one for your project, based on the Regional Truck Corridor Study:

Along Tier 1:	
Miles:	0
(to the nearest 0.1 miles)	
Along Tier 2:	Yes
Miles:	0.1
(to the nearest 0.1 miles)	
Along Tier 3:	
Miles:	0
(to the nearest 0.1 miles)	
The project provides a direct and immediate connection (i.e., intersects) with either a Tier 1, Tier 2, or Tier 3 corridor:	Yes
None of the tiers:	

Measure A: Connection to disadvantaged populations and projects benefits, impacts, and mitigation

*1.**Sub-measure**: Equity Population Engagement: A successful project is one that is the result of active engagement of low-income populations, people of color, persons with disabilities, youth and the elderly. Engagement should occur prior to and during a projects development, with the intent to provide direct benefits to, or solve, an expressed transportation issue, while also limiting and mitigating any negative impacts. Describe and map the location of any low-income populations, people of color, disabled populations, youth or the elderly within a ½ mile of the proposed project. Describe how these specific populations were engaged and provided outreach to, whether through community planning efforts, project needs identification, or during the project development process. Describe what engagement methods and tools were used and how the input is reflected in the projects purpose and need and design. Elements of quality engagement include: outreach and engagement to specific communities and populations that are likely to be directly impacted by the project; techniques to reach out to populations traditionally not involved in community engagement related to transportation projects; feedback from these populations identifying potential positive and negative elements of the proposed project through engagement, study recommendations, or plans that provide feedback from populations that may be impacted by the proposed project. If relevant, describe how NEPA or Title VI regulations will guide engagement activities.*

Response:

This project passes through Census tracts that are Areas of Concentrated Poverty where more than 50% of the population are residents of color (north of Lake St) and Census tracts that are above the regional average of concentrated race/poverty (south of Lake St).

The socioeconomic equity map (attachment 12) identifies sites within the project area that are likely destinations for populations of youth, elderly and low income, along with people living with disabilities. Some of these destinations may include the Hennepin County Human Services and Public Health building, which also includes the Hennepin County WIC office, the YWCA Midtown and multiple stores including Aldi, several dollar stores, Target and Cub Foods. American Community survey data reveals that within 1/2 mile of the project area, 23.9% of the population is under 17 years old, 8.7% of the population is over 65 years old, 55% of the population is a person of color, 12.8% of the population has a disability, and nearly 20% of the population have an income below the poverty level (source: mncompass.org).

The project team will engage project stakeholders again once design begins. While youth, elderly, low-income and people with disabilities have not been specifically targeted, the project team has solicited input for the project at Open Streets events, neighborhood association meetings and additional community meetings. During previous engagement, a stakeholder working group provided input to the project and included the YWCA along with neighborhood organizations bordering the interchange area.

Public engagement strategies during design will build off of previous engagement efforts from

Phase 1 and Phase 2 of the study. Hennepin County communications staff will help lead the effort to solicit feedback from the public and communicate proposed project changes and engagement opportunities to stakeholders. The communications team will also assist with creating and maintaining a website and distribution list for sharing information about the project status, proposed designs and upcoming engagement opportunities.

(Limit 2,800 characters; approximately 400 words)

*2.**Sub-measure**: Equity Population Benefits and Impacts: A successful project is one that has been designed to provide direct benefits to low-income populations, people of color, persons with disabilities, youth and the elderly. All projects must mitigate potential negative benefits as required under federal law. Projects that are designed to provide benefits go beyond the mitigation requirement to proactively provide transportation benefits and solve transportation issues experienced by Equity populations.*
a.Describe the projects benefits to low-income populations, people of color, children, people with disabilities, and the elderly. Benefits could relate to pedestrian and bicycle safety improvements; public health benefits; direct access improvements for residents or improved access to destinations such as jobs, school, health care or other; travel time improvements; gap closures; new transportation services or modal options, leveraging of other beneficial projects and investments; and/or community connection and cohesion improvements. Note that this is not an exhaustive list.

This project will benefit low-income populations, people of color, children, people with disabilities, and the elderly, as well as residents, businesses, and employees living and working nearby. The improved configuration of the interchange combined with safer and more accessible crossings and a wide sidewalk will better connect people with nearby sidewalks and bikeways, buses and light rail transit, and key destinations along the corridor. Important destinations may include the Hennepin County Human Services and Public Health building and WIC office, as well as a Minneapolis Public Schools adult education campus. This project is also located near important destinations for youth such as the YWCA and South High School. Improved multimodal connections along this project corridor will connect to stores including Cub Foods, Aldi,Target and two dollar stores.

Response:

Wider sidewalks will provide a greater setback from moving vehicles resulting in a more comfortable walking experience. Improved crossings will increase intersection safety and comfort thereby encouraging people to consider walking or biking for more trips. The overall effect of the sidewalk and intersections will be to improve the pedestrian experience, strengthening first and last mile connections to transit and connect people with jobs across the city.

Twenty percent of households within a half mile of the project area do not own a vehicle and must rely on rolling, walking, biking or taking transit. For people who cannot afford or choose not to own a vehicle, these means of transportation are the most cost-effective and sustainable options for getting around the city. Additionally, 16.3% of residents within a half mile of the project area utilize transit to commute to work, while 15.8% of residents either walk, bike, or work from home. In comparison, only

about 10% of households across Hennepin County do not own a vehicle, 7.4% of residents take public transportation, and only about 12% walk, bike or work from home (source: Mncompass.org). Furthermore, future bus rapid transit is planned along Lake St, and this project will closely coordinate with the B Line Project to integrate the future B Line platform into the greater intersection improvements. By providing infrastructure that improves connectivity to public transit, this project will improve mobility for residents to connect to downtown and other major job centers across the city.

As it is constructed today, the interchange is a barrier for people walking and biking and requires multiple zig-zag crossings across uncontrolled high-speed free right turn lanes. This project will better connect Lake St on either side of Hiawatha and provide a more cohesive corridor with better access to businesses and services on either end.

(Limit 2,800 characters; approximately 400 words)

b. Describe any negative impacts to low-income populations, people of color, children, people with disabilities, and the elderly created by the project, along with measures that will be taken to mitigate them. Negative impacts that are not adequately mitigated can result in a reduction in points.
Below is a list of negative impacts. Note that this is not an exhaustive list.
Increased difficulty in street crossing caused by increased roadway width, increased traffic speed, wider turning radii, or other elements that negatively impact pedestrian access.
Increased noise.
Decreased pedestrian access through sidewalk removal / narrowing, placement of barriers along the walking path, increase in auto-oriented curb cuts, etc.
Project elements that are detrimental to location-based air quality by increasing stop/start activity at intersections, creating vehicle idling areas, directing an increased number of vehicles to a particular point, etc.
Increased speed and/or cut-through traffic.
Removed or diminished safe bicycle access.
Inclusion of some other barrier to access to jobs and other destinations.
Displacement of residents and businesses.
Mitigation of temporary construction/implementation impacts such as dust; noise; reduced access for travelers and to businesses; disruption of utilities; and eliminated street crossings.
Other

Response:

Once completed, this interchange will no longer be a barrier for people rolling, walking, biking and connecting to transit. Access to Lake St and Hiawatha Ave will remain, though the convenience of uncontrolled free-right turns will be eliminated for people driving.

During construction, Hennepin County and partner agencies will work with business along the corridor to understand temporary impacts to people rolling, walking, biking and taking transit, and driving and will ensure that access to important services and transportation will be maintained.

Hennepin County has a specialized communications team who are responsible for managing a phone hotline and project website during the planning, design and construction phases of the project. The team will be responsible for responding to questions and concerns from residents, business owners, and employees who live and work in the area. Metro Transit will be involved in this process to ensure that any changes to the transit system needed during this time will be conveyed to transit riders along the corridor. For all modes, the project team will develop safe detour routes and will share maps and related information with community members.

Increased noise and impacts to the roadway, sidewalks, and connection to the Hiawatha LRT trail are anticipated during construction. The contractor will be required to follow temporary traffic control plans which provide instructions on temporary accommodations and/or detour routes for all people traveling through the corridor. Access to adjacent buildings will be critical, and staff will seek out opportunities to ensure that nearby businesses and services are not negatively impacted during construction.

(Limit 2,800 characters; approximately 400 words)

Select one:

*3.**Sub-measure: Bonus Points** Those projects that score at least 80% of the maximum total points available through sub-measures 1 and 2 will be awarded bonus points based on the geographic location of the project. These points will be assigned as follows, based on the highest-scoring geography the project contacts:*
a.25 points to projects within an Area of Concentrated Poverty with 50% or more people of color
b.20 points to projects within an Area of Concentrated Poverty
c.15 points to projects within census tracts with the percent of population in poverty or population of color above the regional average percent
d.10 points for all other areas

Project is located in an Area of Concentrated Poverty where 50% or more of residents are people of color (ACP50):	Yes
Project located in Area of Concentrated Poverty:	
Projects census tracts are above the regional average for population in poverty or population of color:	
Project located in a census tract that is below the regional average for population in poverty or populations of color or includes children, people with disabilities, or the elderly:	

(up to 40% of maximum score)

Upload the "Socio-Economic Conditions" map used for this measure. The second map created for sub measure A1 can be uploaded on the Other Attachments Form, or can be combined with the "Socio-Economic Conditions" map into a single PDF and uploaded here.

Upload Map 1589476737149_Attachment 13 - Socioeconomic map.pdf

Measure B: Part 1: Housing Performance Score

City	Segment Length (For stand-alone projects, enter population from Regional Economy map) within each City/Township	Segment Length/Total Project Length	Score	Housing Score Multiplied by Segment percent
Minneapolis	0.2	1.0	100.0	100.0

Total Project Length

Total Project Length 0.2

Project length entered on the Project Information - General form.

Housing Performance Score

Total Project Length (Miles) or Population	0.2
Total Housing Score	100.0

Affordable Housing Scoring

Part 2: Affordable Housing Access

Reference Access to Affordable Housing Guidance located under Regional Solicitation Resources for information on how to respond to this measure and create the map.
If text box is not showing, click Edit or "Add" in top right of page.

Response:

A detailed description of how this project will improve access to affordable housing locations is included below, including number of bedrooms, affordability limit based on area median income (AMI), etc. Attachment 14 identifies specific affordable housing sites within a 1/2 mile of the project location.

Total number of affordable sites within project area: 12

Number of existing sites: 11

Number of sites under construction: 0

Number of planned sites identified: 1

Location 1: Blue Line Flats
Affordable Units: 135

Bedrooms per unit: 1-3

30% AMI: 9

50% AMI: 37

60% AMI: 89

LIHTC

Location 2: Clare Midtown

Affordable Units: 45

Bedrooms per unit: 0-1

30% AMI: 8

50% AMI: 37

LIHTC

Location 3: Eastgate Apartments

Affordable Units: 135

Bedrooms per unit: 0-2

60% AMI: 135

Location 4: Hiawatha Commons

Affordable Units: 64

Bedrooms per unit: 0-2

30% AMI: 8

50% AMI: 17

60% AMI: 39

LIHTC

Location 5: L& H Station

Affordable Units: 123

Bedrooms per unit: 0-2

80% AMI: 123

Location 6: Lake Street Station

Affordable Units: 64

Bedrooms per unit: 1-2

60% AMI: 64

LIHTC

Location 7: Minnehaha Commons

Affordable Units: 44

Bedrooms per unit: NA

50% AMI: 44

Section 8

Location 8: Phillips Re-design

Affordable Units: 89

Bedrooms per unit: 0-4

60% AMI: 89

LIHTC

Location 9: Rochester Senior Housing

Affordable Units: 53

Bedrooms per unit: 1

50% AMI: 53

Location 10: Trinity Apts

Affordable Units: 120

Bedrooms per unit: 1-2

60% AMI: 120

Section 8

Location 11: Trinity Lake Apts

Affordable Units: 16

Bedrooms per unit: 1-2

50% AMI: 16

LIHTC

Location 12: Midtown Corner (Planned)

Affordable Units: 38

Bedrooms per unit: 0-2

60% AMI: 38

(Limit 2,100 characters; approximately 300 words)

Upload map:

1589476887999_Attachment 14 - Affordable Housing Access Map.pdf

Measure A: Congestion Reduction/Air Quality

Total Peak Hour Delay Per Vehicle Without The Project (Seconds/ Vehicle)	Total Peak Hour Delay Per Vehicle With The Project (Seconds/ Vehicle)	Total Peak Hour Delay Per Vehicle Reduced by Project (Seconds/ Vehicle)	Volume without the Project (Vehicles per hour)	Volume with the Project (Vehicles Per Hour):	Total Peak Hour Delay Reduced by the Project:	Total Peak Hour Delay Reduced by the Project:	EXPLANATION of methodology used to calculate railroad crossing delay, if applicable.	Synchro or HCM Reports

41.0	32.0	9.0	3305	3010	29745.0	27090.0	Not Applicable	1589477065315_Attachment 15 - MOE report.pdf
						27090		

Vehicle Delay Reduced

Total Peak Hour Delay Reduced	29745.0
Total Peak Hour Delay Reduced	27090.0

Measure B:Roadway projects that do not include new roadway segments or railroad grade-separation elements

Total (CO, NOX, and VOC) Peak Hour Emissions without the Project (Kilograms):	Total (CO, NOX, and VOC) Peak Hour Emissions with the Project (Kilograms):	Total (CO, NOX, and VOC) Peak Hour Emissions Reduced by the Project (Kilograms):
6.02	6.38	-0.36
6	**6**	**0**

Total

Total Emissions Reduced:	-0.36
Upload Synchro Report	1589477425220_Attachment 15 - MOE report.pdf

Please upload attachment in PDF form. (Save Form, then click 'Edit' in top right to upload file.)

Measure B: Roadway projects that are constructing new roadway segments, but do not include railroad grade-separation elements (for Roadway Expansion applications only):

Total (CO, NOX, and VOC) Peak Hour Emissions without the Project (Kilograms):	Total (CO, NOX, and VOC) Peak Hour Emissions with the Project (Kilograms):	Total (CO, NOX, and VOC) Peak Hour Emissions Reduced by the Project (Kilograms):
0	**0**	**0**

Total Parallel Roadway

Emissions Reduced on Parallel Roadways	0
Upload Synchro Report	

Please upload attachment in PDF form. (Save Form, then click 'Edit' in top right to upload file.)

New Roadway Portion:

Cruise speed in miles per hour with the project:	0
Vehicle miles traveled with the project:	0
Total delay in hours with the project:	0
Total stops in vehicles per hour with the project:	0
Fuel consumption in gallons:	0
Total (CO, NOX, and VOC) Peak Hour Emissions Reduced or Produced on New Roadway (Kilograms):	0
EXPLANATION of methodology and assumptions used:(Limit 1,400 characters; approximately 200 words)	
Total (CO, NOX, and VOC) Peak Hour Emissions Reduced by the Project (Kilograms):	0.0

Measure B:Roadway projects that include railroad grade-separation elements

Cruise speed in miles per hour without the project:	0
Vehicle miles traveled without the project:	0
Total delay in hours without the project:	0
Total stops in vehicles per hour without the project:	0
Cruise speed in miles per hour with the project:	0
Vehicle miles traveled with the project:	0
Total delay in hours with the project:	0
Total stops in vehicles per hour with the project:	0
Fuel consumption in gallons (F1)	0
Fuel consumption in gallons (F2)	0
Fuel consumption in gallons (F3)	0
Total (CO, NOX, and VOC) Peak Hour Emissions Reduced by the Project (Kilograms):	0
EXPLANATION of methodology and assumptions used:(Limit 1,400 characters; approximately 200 words)	

Measure A: Benefit of Crash Reduction

Crash Modification Factor Used:

CMF 1414: Install additional primary signal head

CMF 1417: Install additional primary siganl head

CMF 1420: Convert signal from pedestal-mounted to mast arm

CMF 8431: Improve angle of channelized right turn lanes

FHWA Desktop Reference: Bike and Ped nighttime crashes

FHWA Desktop Reference: Install refuge island

(Limit 700 Characters; approximately 100 words)

Rationale for Crash Modification Selected:

CMF 1414: install additional primary signal head has a crash reduction factor of 28%. This CMF will address rear-end and side swipe crashes that occur on Lake St. Crash data reveals that between 2016-2018, there have been 26 rear-end and sideswipe crashes within the project limits.

CMF 1417: install additional primary signal head has a crash reduction factor of 28%. As part of the this project, new signal heads will improve visibility at the interchange to address rear-end crashes involving eastbound vehicles on Lake St.

CMF 1420: install mast arms and improve intersection lighting will address rear-end, left-turn, right-angle and bike and ped crashes along 22nd Ave (this is also addressed in the FHWA Desktop Reference for bike/ped nighttime crashes). These CMFs have a crash reduction factor of 49% and 42%, respectively.

CMF 8431: improve the angle of right-turns will address crashes involving right turning vehicles. This CMF provides a 60.3% reduction in crashes and will be addressed by revising the existing unsiganlized free-right turns and improving the pedestrian realm for people crossing.

FHWA Desktop Reference Guide notes that installing refuge islands for pedestrians will provide a crash reduction factor of 56%. One of the goals of this project is to improve crossings for people walking and rolling, including the addition of pedestrian refuge islands.

(Limit 1400 Characters; approximately 200 words)

Project Benefit ($) from B/C Ratio	$4,823,714.00
Total Fatal (K) Crashes:	0
Total Serious Injury (A) Crashes:	1
Total Non-Motorized Fatal and Serious Injury Crashes:	0
Total Crashes:	51
Total Fatal (K) Crashes Reduced by Project:	0
Total Serious Injury (A) Crashes Reduced by Project:	0
Total Non-Motorized Fatal and Serious Injury Crashes Reduced by Project:	0
Total Crashes Reduced by Project:	6
Worksheet Attachment	1589477903767_Attachment 17 - Benefit cost worksheets and list of CMFs.pdf

Upload Crash Modification Factors and B/C Worksheet in PDF form.

Measure A: Multimodal Elements and Existing Connections

Response:

Pedestrians are the county's most vulnerable road users and this project will provide numerous safety improvements to protect people walking and rolling along and across Lake St. This intersection ranks 14th on a list of state intersections with the highest pedestrian crash totals in the city (Minneapolis Pedestrian Crash Study). Proposed safety improvements will be further evaluated during the design phase. The list of potential improvements are consistent with FHWA's Safe Transportation for Every Pedestrian Program, FHWA Proven Safety Countermeasures and MnDOT's Best Practices for Pedestrian Bicycle Safety, and include the following:

-ADA compliant curb ramps will be reconstructed to serve people walking, rolling and biking. Curb ramps ensure that people of all abilities can safely and easily cross a roadway.

-Traffic signals will be added or upgraded at this interchange in order to signal to all modes when it is safe to cross an intersection. The upgraded traffic signals provide an opportunity to include additional countermeasures to be incorporated into the project, such as specific pedestrian phasing and accessible pedestrian signals (APS).

-APS will be added to signalized intersections and will include accessible pedestrian push buttons to provide an audible signal for people to cross. Pedestrian countdown timers are included in this improvement.

-High visibility crosswalks will be constructed to clearly designate safe crossing locations. These crosswalks provide a visual reminder to people driving to look for people about to cross and improve visibility for people already crossing the street.

-Pedestrian refuge median islands will facilitate a two-stage crossing for those people who cannot cross all general travel lanes during one signal cycle and improve pedestrian visibility. Refuge medians also help slow vehicle speeds. All refuge islands will be ADA compliant. FHWA notes that pedestrian refuge islands can reduce pedestrian crashes by 32%.
-Geometric improvements such as narrowing turning radii will improve walkability and overall safety at intersections as people driving will be forced to reduce speeds to safely make a turn.

-A widened sidewalk will be constructed to better connect people to nearby destinations, sidewalks and trails. Sidewalks are physically separated from moving vehicles by a curb, reducing potential conflict between vulnerable roadway users and people driving. The sidewalk will provide adequate space for people who walk, roll and bike to traverse the corridor and connect to key destinations. The sidewalk will provide a direct path for people walking along Lake St. With the number of free right turns reduced through the new interchange design, the number of crossings will also be reduced for people walking and rolling.

(Limit 2,800 characters; approximately 400 words)

Measure A: Multimodal Elements and Existing Connections

Response:

As identified in both phases of the study, the need for multimodal safety improvements rises to the top. People walking and rolling along Lake St must cross signalized and unsignalized intersections, including free rights with high-speed vehicles exiting Hiawatha Ave, and as many as six vehicle lanes without a refuge island. While there are pedestrian islands in some locations, people traversing the corridor are required to zigzag across multiple crossings despite what could be a straight line path. The update from a single point urban interchange to a tight diamond design creates two interconnected intersections, and will have a huge improvement on pedestrian safety and operations as free-right islands will be removed, curb ramps will be replaced, crossing distances will be shortened and include refuge median islands, and turning radii will be reconfigured to encourage slower turning speeds. This project does not address a specific location identified as being deficient in the ADA transition plan but will make improvements to curb ramps and APS to help those with mobility impairments navigate the corridor.

For people biking, the design strategies incorporated into this project will improve the mobility, safety, and comfort of trail users accessing the nearby transit stops from the Hiawatha LRT Trail. This trail also connects people biking to the Midtown Greenway, an important east-west connection across the city (attachment 3).

For people taking transit, the improved rolling, walking and biking connections will make connecting to the Lake Street light rail station and bus stops along Lake St much more accessible. Metro Transit routes 21 and 27 currently extend along Lake St, and this project will include increased space for a future bus rapid transit platform and shelter at 22nd Ave S. Today, a bus shelter only exists at the stop on the south side of

Lake St near 22nd Ave S.

This project's improvements positively affect the Hiawatha LRT Trail, a regional trail that parallels Hiawatha. The RBTN identifies this trail as a Tier 1 alignment. The Hiawatha LRT Trail directly connects to the Midtown Greenway, also identified as a Tier 1 alignment, and just a few blocks north of the project location. Access to these trails will be improved upon construction of the widened sidewalk and safer crossings.

The Regional Bicycle Barriers Study categorizes freeways and expressways as a barrier, which includes Hiawatha Ave. 32nd Ave S at Hiawatha Ave, 0.25 miles to the south, is a tier 1 barrier crossing point (H212). By improving the crossings and access to trails at the Hi-Lake interchange, this project may reduce the need for crossings at 32nd Ave until future improvements can be made.

(Limit 2,800 characters; approximately 400 words)

Transit Projects Not Requiring Construction

If the applicant is completing a transit application that is operations only, check the box and do not complete the remainder of the form. These projects will receive full points for the Risk Assessment.
Park-and-Ride and other transit construction projects require completion of the Risk Assessment below.

Check Here if Your Transit Project Does Not Require Construction

Measure A: Risk Assessment - Construction Projects

1)Layout (25 Percent of Points)

Layout should include proposed geometrics and existing and proposed right-of-way boundaries.

Layout approved by the applicant and all impacted jurisdictions (i.e., cities/counties that the project goes through or agencies that maintain the roadway(s)). A PDF of the layout must be attached along with letters from each jurisdiction to receive points.

100%

Attach Layout

Please upload attachment in PDF form.

Layout completed but not approved by all jurisdictions. A PDF of the layout must be attached to receive points. Yes

50%

Attach Layout 1589478662864_Attachment 04 - Potential layout.pdf

Please upload attachment in PDF form.

Layout has not been started

0%

Anticipated date or date of completion

2)Review of Section 106 Historic Resources (15 Percent of Points)

No known historic properties eligible for or listed in the National Register of Historic Places are located in the project area, and project is not located on an identified historic bridge Yes

100%

There are historical/archeological properties present but determination of no historic properties affected is anticipated.

100%

Historic/archeological property impacted; determination of no adverse effect anticipated

80%

Historic/archeological property impacted; determination of adverse effect anticipated

40%

Unsure if there are any historic/archaeological properties in the project area.

0%

Project is located on an identified historic bridge

3)Right-of-Way (25 Percent of Points)

Right-of-way, permanent or temporary easements either not required or all have been acquired

100%

Right-of-way, permanent or temporary easements required, plat, legal descriptions, or official map complete

50%

Right-of-way, permanent or temporary easements required, parcels identified Yes

25%

Right-of-way, permanent or temporary easements required, parcels not all identified

0%

Anticipated date or date of acquisition

4)Railroad Involvement (15 Percent of Points)

No railroad involvement on project or railroad Right-of-Way agreement is executed (include signature page, if applicable)

100%

Signature Page

Please upload attachment in PDF form.

Railroad Right-of-Way Agreement required; negotiations have begun

50%

Railroad Right-of-Way Agreement required; negotiations have not begun. Yes

0%

Anticipated date or date of executed Agreement 01/01/2024

5) Public Involvement (20 percent of points)

Projects that have been through a public process with residents and other interested public entities are more likely than others to be successful. The project applicant must indicate that events and/or targeted outreach (e.g., surveys and other web-based input) were held to help identify the transportation problem, how the potential solution was selected instead of other options, and the public involvement completed to date on the project. List Dates of most recent meetings and outreach specific to this project:

Meeting with general public: 11/13/2018

Meeting with partner agencies: 04/18/2019

Targeted online/mail outreach: 09/30/2019

Number of respondents: 8000

Meetings specific to this project with the general public and partner agencies have been used to help identify the project need. Yes

100%

Targeted outreach to this project with the general public and partner agencies have been used to help identify the project need.

75%

At least one meeting specific to this project with the general public has been used to help identify the project need.

50%

At least one meeting specific to this project with key partner agencies has been used to help identify the project need.

50%

No meeting or outreach specific to this project was conducted, but the project was identified through meetings and/or outreach related to a larger planning effort.

25%

No outreach has led to the selection of this project.

0%

Response (Limit 2,800 characters; approximately 400 words):

The Phase 1 study was initiated in response to neighborhood concerns. Both the Corcoran and Longfellow neighborhoods as well as the Lake Street Council were key facilitators for public engagement during the study. During Phase 1, community engagement helped refine the vision of the study and informed the long-term project alternatives. Potential safety improvements were categorized into three tiers in order to address issues as resources became available.

Phase 2 focused on the feasibility of the alternatives developed in Phase 1 and incorporated a more robust engagement process. In both 2017 and 2018, the project team hosted a booth at Open Streets events at Lake Street and Minnehaha Avenue, providing an opportunity to get feedback from a more diverse group of community members. Open Streets often attract a wider audience than open houses or other project-specific events, particularly because the programming caters to families.

The project team also convened a stakeholder working group, comprised of the following organizations: Corcoran Neighborhood Organization, Longfellow Community Council, Lake Street Council, East Phillips Improvement Coalition, Wellington Management, Inc., YWMCA, Our Streets Minneapolis, The Sierra Club North Star Chapter, and Minneapolis Ward 9 Council Office. The stakeholder working group met twice during phase 2 of the study.

Finally, the project team attended the following meetings where residents had an opportunity to ask questions and provide feedback: Corcoran Neighborhood Association meeting (5/30/17 and 7/6/17), Longfellow Community Council meeting

(1/18/17), and two additional community meetings hosted by the Longfellow Community Council (2/27/17 and 11/13/18).

The last email update was sent from the Lake Street Council on 9/30/19, which provided a project update and asked for feedback. Between reaching out to residents and businesses through city/county communications, neighborhood and business district newsletters, and in-person events, the county estimates that over 8,000 people have been directly informed about the project and have had an opportunity to provide feedback.

As a result of the feedback received, improvements at the interchange will focus on multimodal safety, access, comfort and connections to nearby destinations including transit, housing, retail, community organizations and the larger trail network. The need for multi-modal improvements rose to the top during the engagement process and these improvements have also been prioritized in short-term. The proposed project has the strong support of community organizations in the Hi-Lake area. MnDOT's willingness to contribute funds toward the interchange reconfiguration is a direct result of their observations during the public engagement process.

Measure A: Cost Effectiveness

Total Project Cost (entered in Project Cost Form):	$5,659,400.00
Enter Amount of the Noise Walls:	$0.00
Total Project Cost subtract the amount of the noise walls:	$5,659,400.00
Enter amount of any outside, competitive funding:	$0.00
Attach documentation of award:	

Points Awarded in Previous Criteria	
Cost Effectiveness	$0.00

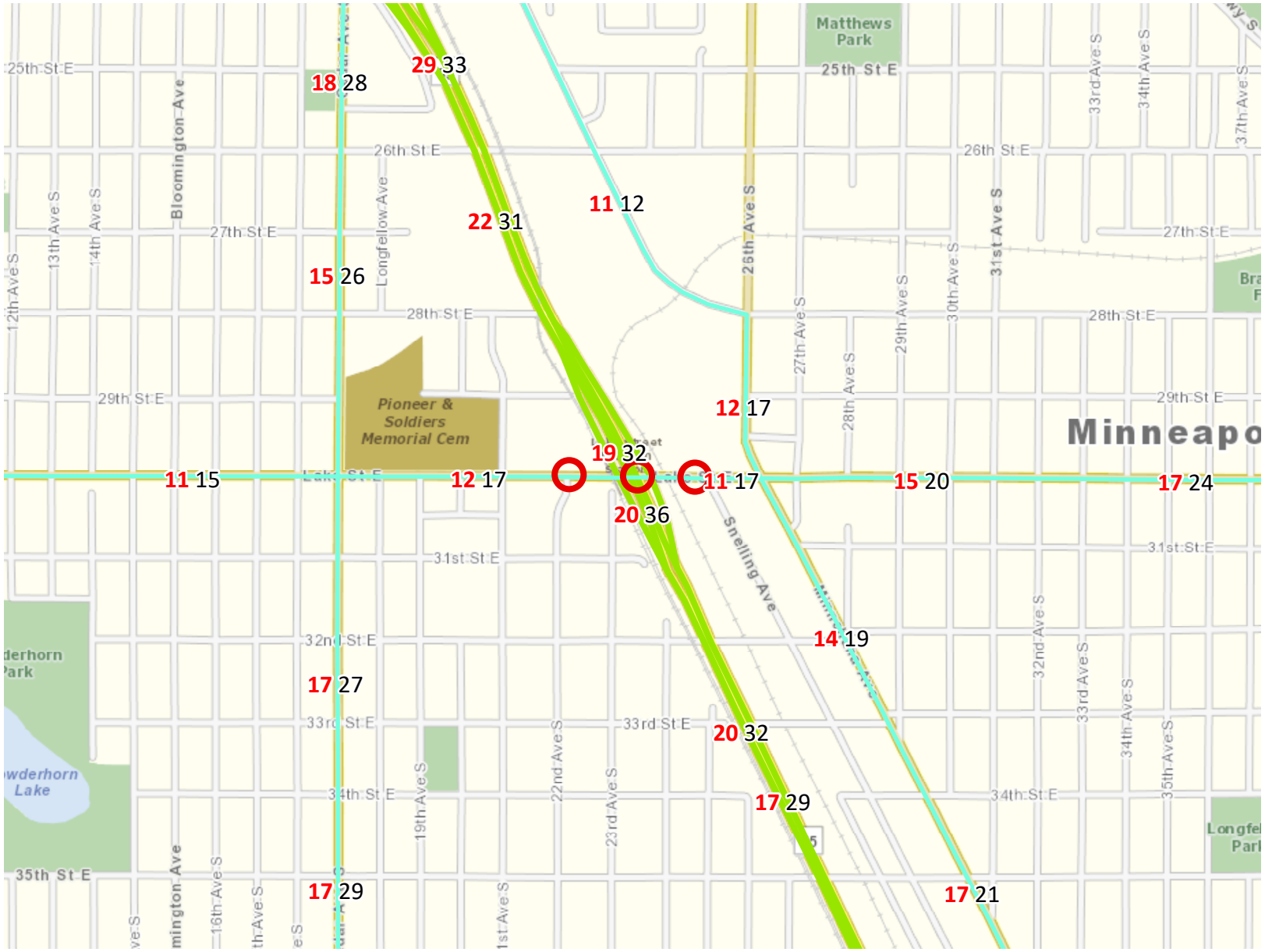
Other Attachments

File Name	Description	File Size
Attachment 00 - List of attachments.pdf	Attachment 00 - List of attachments	126 KB
Attachment 01 - Project summary.pdf	Attachment 01 - Project summary	893 KB
Attachment 02 - Photos of existing conditions.pdf	Attachment 02 - Photos of existing conditions	375 KB
Attachment 03 - Project location map.pdf	Attachment 03 - Project location map	588 KB
Attachment 04 - Potential layout.pdf	Attachment 04 - Potential layout	477 KB
Attachment 05 - Supporting plans and documents_Hennepin County.pdf	Attachment 05 - Supporting plans and documents_Hennepin County	1.7 MB
Attachment 06 - Supporting plans and documents_Minneapolis.pdf	Attachment 06 - Supporting plans and documents_Minneapolis	2.4 MB
Attachment 07 - CIP Provisional Project Summary.pdf	Attachment 07 - CIP Provisional Project Summary	882 KB
Attachment 08 - Excerpts from Hi-Lake Study Phase 1.pdf	Attachment 08 - Excerpts from Hi-Lake Study Phase 1	1.5 MB
Attachment 09 - Excerpts from Hi-Lake Study Phase 2.pdf	Attachment 09 - Excerpts from Hi-Lake Study Phase 2	1.3 MB
Attachment 10 - Lake St level of congestion map.pdf	Attachment 10 - Lake St level of congestion map	4.9 MB
Attachment 11 - Franklin Ave level of congestion map.pdf	Attachment 11 - Franklin Ave level of congestion map	4.2 MB
Attachment 12 - Socioeconomic equity map.pdf	Attachment 12 - Socioeconomic equity map	812 KB
Attachment 13 - Socioeconomic map.pdf	Attachment 13 - Socioeconomic map	2.6 MB
Attachment 14 - Affordable housing access map.pdf	Attachment 14 - Affordable housing access map	423 KB
Attachment 15 - MOE report.pdf	Attachment 15 - MOE report	1.0 MB
Attachment 16 - Crash map and detail listing.pdf	Attachment 16 - Crash map and detail listing	1.9 MB
Attachment 17 - Benefit cost worksheets and list of CMFs.pdf	Attachment 17 - Benefit cost worksheets and list of CMFs	2.5 MB
Attachment 18 - Support letters.pdf	Attachment 18 - Support letters	256 KB

Attachment 10 - Lake St level of congestion

Level of Congestion

Roadway Spot Mobility & Safety Project: Hi/Lake Interchange Safety Improvements | Map ID: 1587396362792



Project Points
A Minor Arterials
A Minor Arterials Planned
Principal Arterials
Principal Arterials Planned

0 0.125 0.25 0.5 0.75 1 Miles

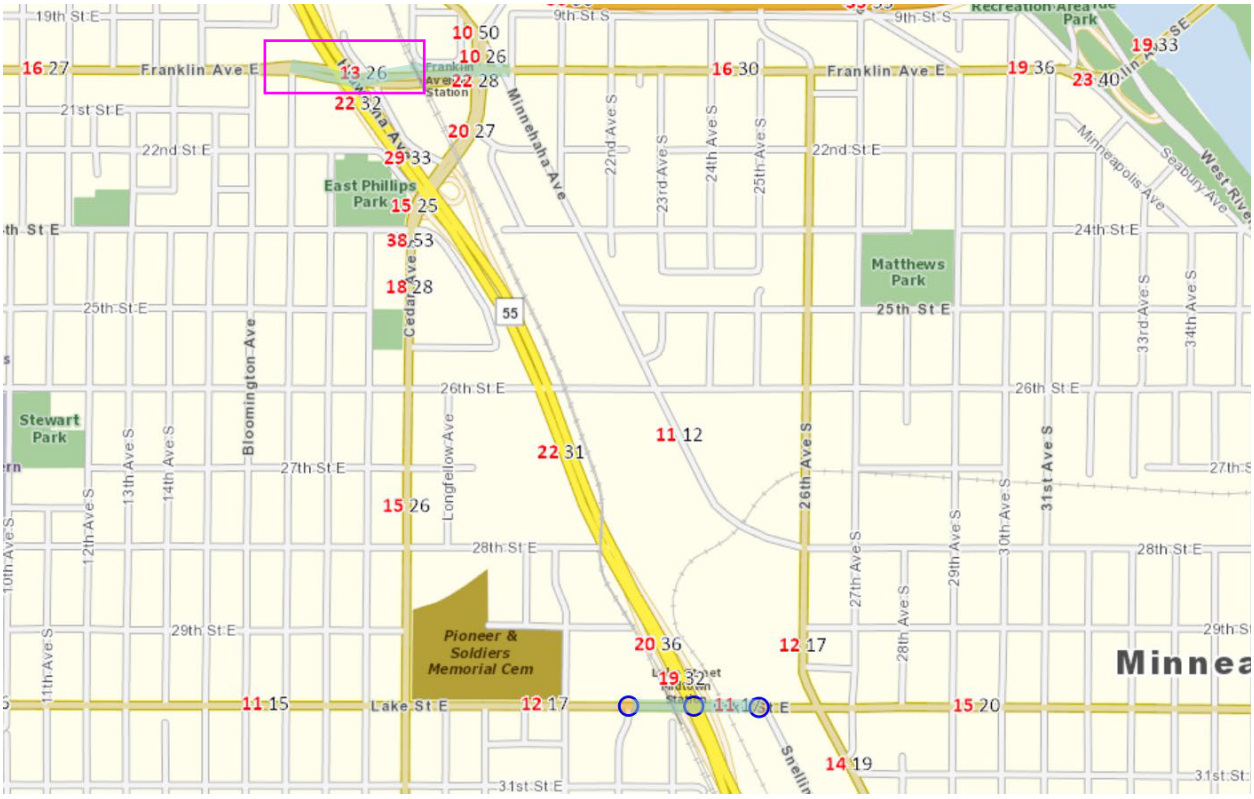
Created: 4/20/2020
LandscapeRSA1

For complete disclaimer of accuracy, please visit https://giswebsite.metc.state.mn.us/gissite/notice.aspx

METROPOLITAN COUNCIL

Attachment 11 - Franklin Ave level of congestion map

Revised level of congestion map showing parallel roadway (Franklin Ave E)



Attachment 13 - Socio-economic map

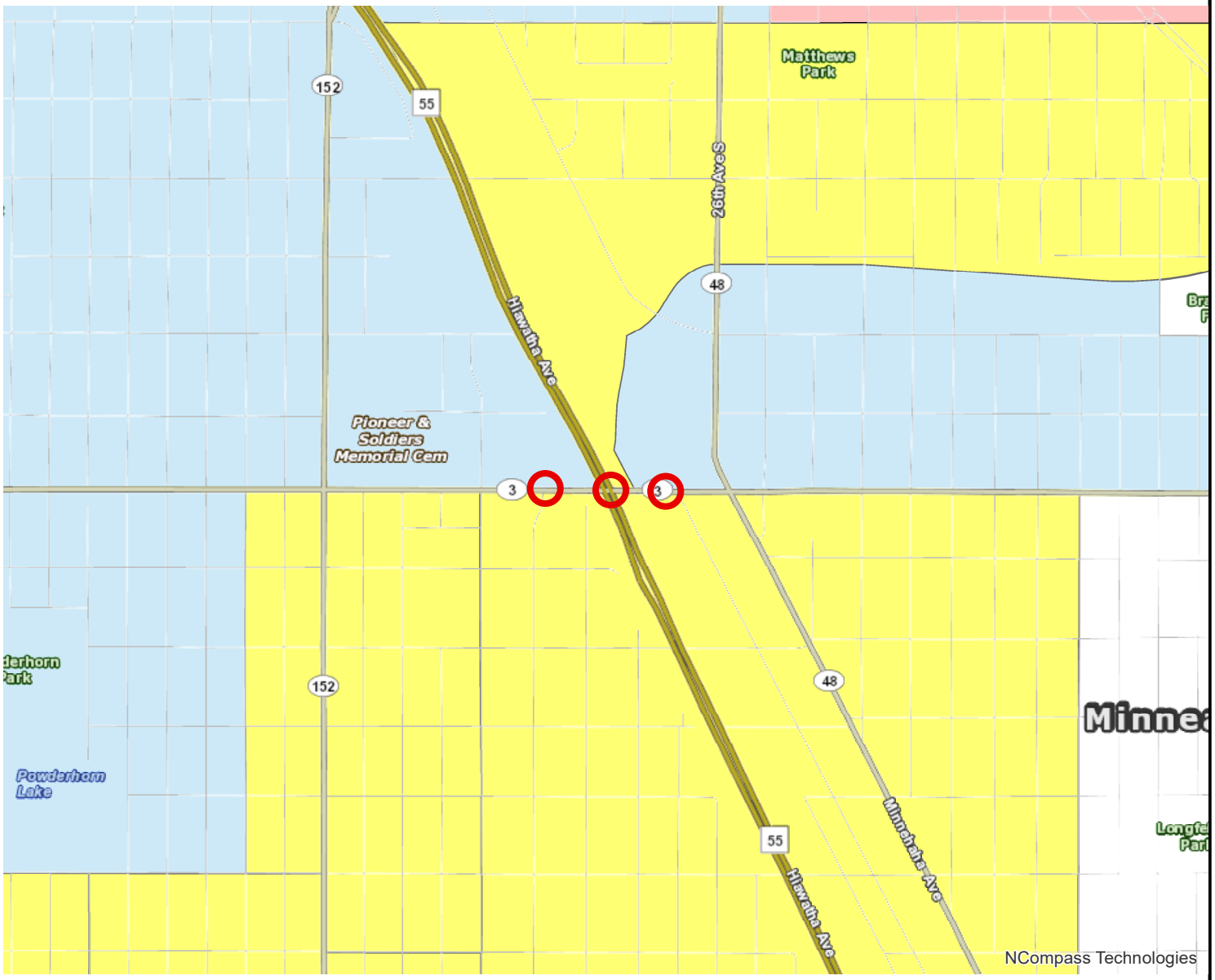
Socio-Economic Conditions

Roadway Spot Mobility & Safety Project: Hi/Lake Interchange Safety Improvements | Map ID: 1587396362792

Results

Project located **IN**
Area of Concentrated Poverty with 50% or more of residents are people of color (ACP50):
(0 to 30 Points)

Tracts within half-mile:
8500 107400 107500
108600 108700 108800
125900



Points

Area of Concentrated Poverty > 50% residents of color

Area of Concentrated Poverty

Above reg'l avg conc of race/poverty

0 0.15 0.3 0.6 0.9 1.2 Miles

Created: 4/20/2020
LandscapeRSA2

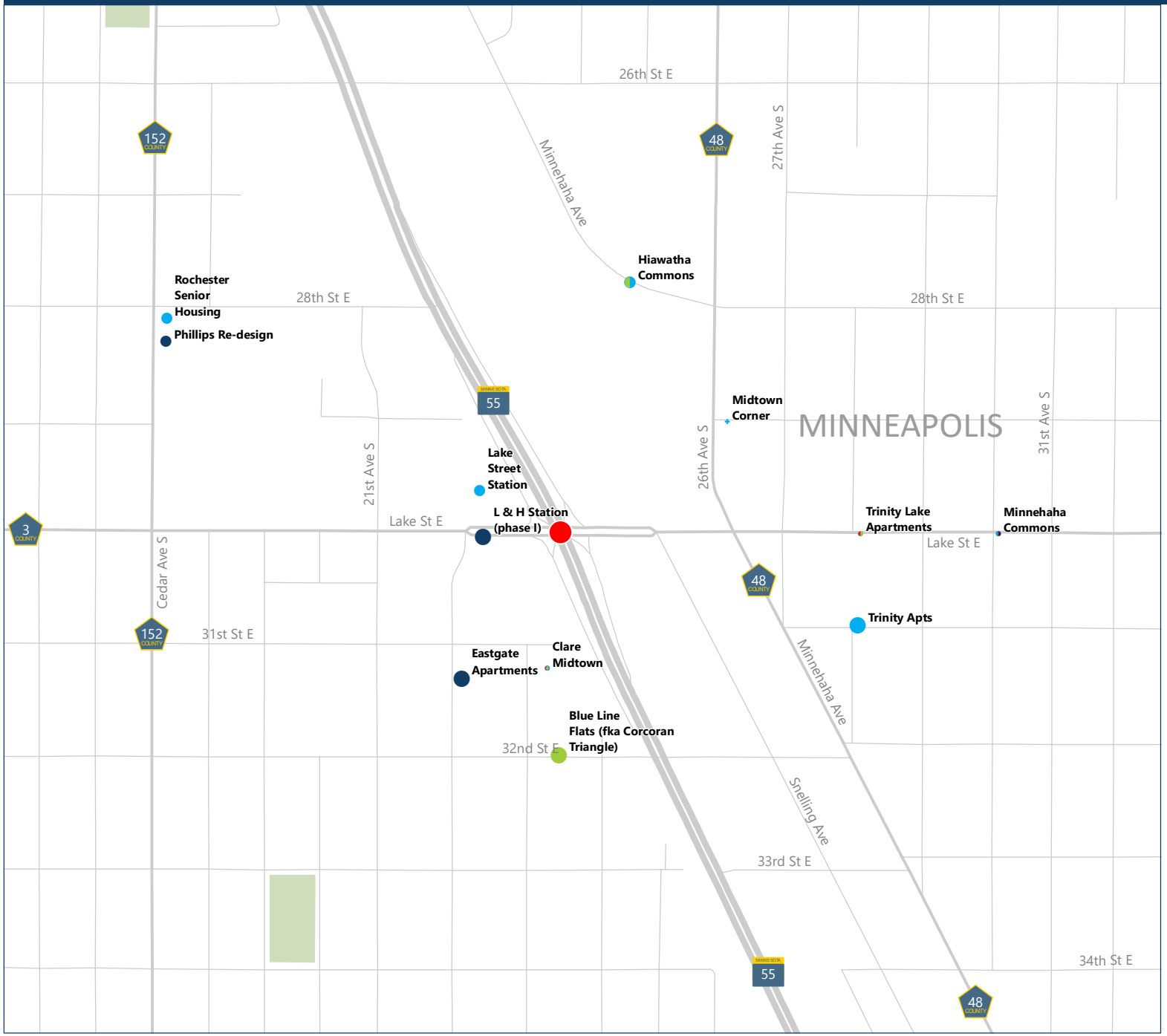
For complete disclaimer of accuracy, please visit http://giswebsite.metc.state.mn.us/gissite/notice.aspx

METROPOLITAN COUNCIL

CSAH 3 (Lake Street) Spot Mobility & Safety Project

Attachment 14 | Affordable Housing Access Map

HENNEPIN COUNTY
MINNESOTA



Key

- Project Location

Groups Served

- People with Disabilities
- Elderly
- Family
- Homeless
- Single People
- Multiple Groups
- No Information

Affordable Units

- 0 - 50
- 51 - 100
- 101 - 150
- 151 - 200
- 201 - 1500

Construction Status

- Complete
- Planned

0 0.125 0.25 Miles

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.

Published date: 4/29/2020

N

Hennepin

Attachment 15. MOE report

Existing Conditions (AM Peak) 04/22/2020

124: Hiawatha Av S SB Ramp & Hiawatha Av S NB Ramp & Lake St E

Direction	All
Future Volume (vph)	3305
Total Delay / Veh (s/v)	41
CO Emissions (kg)	4.22
NOx Emissions (kg)	0.82
VOC Emissions (kg)	0.98

Proposed Conditions (AM Peak) 04/22/2020

3: Hiawatha Ave S SB Ramp & Lake St E

Direction	All
Future Volume (vph)	3031
Total Delay / Veh (s/v)	25
CO Emissions (kg)	3.17
NOx Emissions (kg)	0.62
VOC Emissions (kg)	0.73

124: Hiawatha Av S NB Ramp & Lake St E

Direction	All
Future Volume (vph)	2990
Total Delay / Veh (s/v)	7
CO Emissions (kg)	1.31
NOx Emissions (kg)	0.25
VOC Emissions (kg)	0.30

Notes from the Applicant:

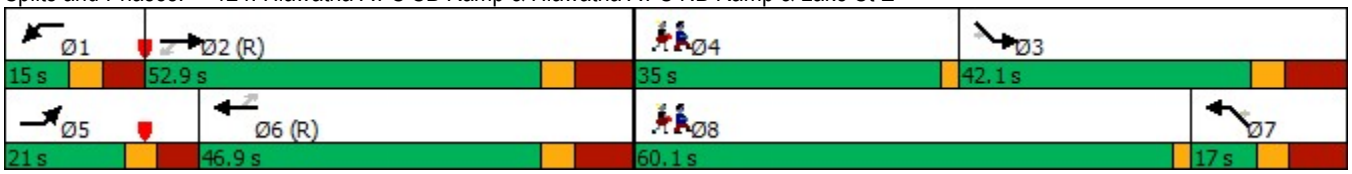
1) Staff was unable to collect turning movement counts within the last 3 years given the current abnormal travel patterns caused by COVID-19. Therefore, staff used turning movement counts collected in 2015, as part of the Hi-Lake Interchange Study, and applied an annual growth rate of 0.5% as recommended in the study.

2) The traffic volumes in the Existing Conditions and the Proposed Conditions are slightly different due to the conversion of the SPUI Design to a Tight Diamond Design. Therefore, staff added the delay and emissions experienced at both intersections in the proposed conditions and compared it to existing conditions experienced at the SPUI.

Lane Group	EBL	EBT	EBR2	WBL	WBT	WBR2	SEL	SER2	NWL	NWR2	Ø4	Ø8
Lane Configurations												
Traffic Volume (vph)	145	920	75	60	835	235	685	240	70	40		
Future Volume (vph)	145	920	75	60	835	235	685	240	70	40		
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	Perm	Prot	Perm		
Protected Phases	5	2		1	6		3		7		4	8
Permitted Phases			2			6		3		7		
Detector Phase	5	2	2	1	6	6	3	3	7	7		
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	5.0	5.0	5.0	7.0	7.0
Minimum Split (s)	15.0	27.0	27.0	15.0	27.0	27.0	15.5	15.5	15.0	15.0	35.0	35.0
Total Split (s)	21.0	52.9	52.9	15.0	46.9	46.9	42.1	42.1	17.0	17.0	35.0	60.1
Total Split (%)	14.5%	36.5%	36.5%	10.3%	32.3%	32.3%	29.0%	29.0%	11.7%	11.7%	24%	41%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.0	2.0
All-Red Time (s)	4.5	6.5	6.5	4.5	6.5	6.5	7.0	7.0	6.5	6.5	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	8.0	10.0	10.0	8.0	10.0	10.0	10.5	10.5	10.0	10.0		
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	23.2	60.5	60.5	12.6	49.9	49.9	43.3	43.3	37.0	37.0		
Actuated g/C Ratio	0.16	0.42	0.42	0.09	0.34	0.34	0.30	0.30	0.26	0.26		
v/c Ratio	0.58	0.72	0.15	0.44	0.75	0.57	0.74	0.41	0.09	0.09		
Control Delay	64.8	39.3	0.6	71.4	47.4	22.0	50.8	12.9	37.4	0.3		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	64.8	39.3	0.6	71.4	47.4	22.0	50.8	12.9	37.4	0.3		
LOS	E	D	A	E	D	C	D	B	D	A		
Approach Delay		40.0			43.4							
Approach LOS		D			D							

Intersection Summary	
Cycle Length: 145	
Actuated Cycle Length: 145	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green	
Natural Cycle: 145	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 40.9	Intersection LOS: D
Intersection Capacity Utilization 74.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 124: Hiawatha Av S SB Ramp & Hiawatha Av S NB Ramp & Lake St E



Lane Group	EBT	WBL	WBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	1065	60	905	685	0
Future Volume (vph)	1065	60	905	685	0
Turn Type	NA	pm+pt	NA	Prot	NA
Protected Phases	6	5	2	8	
Permitted Phases		2			8
Detector Phase	6	5	2	8	8
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	23.5	23.5	23.5	39.5	39.5
Total Split (s)	27.0	23.5	50.5	39.5	39.5
Total Split (%)	30.0%	26.1%	56.1%	43.9%	43.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	6.5	6.5
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	C-Max	None	C-Max	None	None
Act Effct Green (s)	35.8	46.3	46.3	31.7	31.7
Actuated g/C Ratio	0.40	0.51	0.51	0.35	0.35
v/c Ratio	0.64	0.29	0.54	0.89	0.80
Control Delay	24.9	18.5	10.5	47.0	31.7
Queue Delay	0.0	0.0	0.2	0.0	0.0
Total Delay	24.9	18.5	10.7	47.0	31.7
LOS	C	B	B	D	C
Approach Delay	24.9		11.2		39.6
Approach LOS	C		B		D

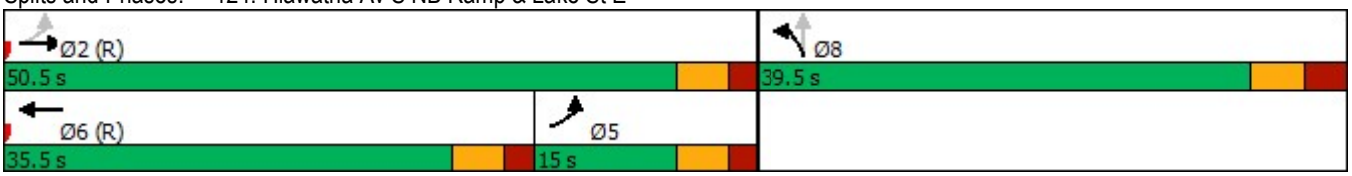
Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 66 (73%), Referenced to phase 2:WBTL and 6:EBT, Start of 1st Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 25.1	Intersection LOS: C
Intersection Capacity Utilization 91.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 3: Hiawatha Ave S SB Ramp & Lake St E

Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Traffic Volume (vph)	145	1605	895	0
Future Volume (vph)	145	1605	895	0
Turn Type	pm+pt	NA	NA	NA
Protected Phases	5	2	6	
Permitted Phases	2			8
Detector Phase	5	2	6	8
Switch Phase				
Minimum Initial (s)	5.0	10.0	10.0	7.0
Minimum Split (s)	15.0	32.5	32.5	39.5
Total Split (s)	15.0	50.5	35.5	39.5
Total Split (%)	16.7%	56.1%	39.4%	43.9%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	6.5
Lead/Lag	Lag		Lead	
Lead-Lag Optimize?	Yes		Yes	
Recall Mode	None	C-Max	C-Max	None
Act Effct Green (s)	69.7	69.7	54.7	8.3
Actuated g/C Ratio	0.77	0.77	0.61	0.09
v/c Ratio	0.38	0.65	0.43	0.49
Control Delay	6.0	4.2	9.4	19.0
Queue Delay	3.4	0.9	0.0	0.0
Total Delay	9.4	5.1	9.4	19.0
LOS	A	A	A	B
Approach Delay		5.4	9.4	19.0
Approach LOS		A	A	B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 8 (9%), Referenced to phase 2:EBTL and 6:WBT, Start of 1st Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 7.4	Intersection LOS: A
Intersection Capacity Utilization 91.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 124: Hiawatha Av S NB Ramp & Lake St E



Attachment 15. MOE report

Existing Conditions (AM Peak) 04/22/2020

124: Hiawatha Av S SB Ramp & Hiawatha Av S NB Ramp & Lake St E

Direction	All
Future Volume (vph)	3305
Total Delay / Veh (s/v)	41
CO Emissions (kg)	4.22
NOx Emissions (kg)	0.82
VOC Emissions (kg)	0.98

Proposed Conditions (AM Peak) 04/22/2020

3: Hiawatha Ave S SB Ramp & Lake St E

Direction	All
Future Volume (vph)	3031
Total Delay / Veh (s/v)	25
CO Emissions (kg)	3.17
NOx Emissions (kg)	0.62
VOC Emissions (kg)	0.73

124: Hiawatha Av S NB Ramp & Lake St E

Direction	All
Future Volume (vph)	2990
Total Delay / Veh (s/v)	7
CO Emissions (kg)	1.31
NOx Emissions (kg)	0.25
VOC Emissions (kg)	0.30

Notes from the Applicant:

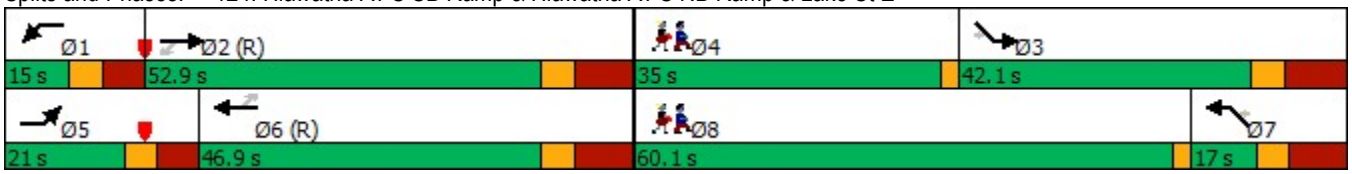
1) Staff was unable to collect turning movement counts within the last 3 years given the current abnormal travel patterns caused by COVID-19. Therefore, staff used turning movement counts collected in 2015, as part of the Hi-Lake Interchange Study, and applied an annual growth rate of 0.5% as recommended in the study.

2) The traffic volumes in the Existing Conditions and the Proposed Conditions are slightly different due to the conversion of the SPUI Design to a Tight Diamond Design. Therefore, staff added the delay and emissions experienced at both intersections in the proposed conditions and compared it to existing conditions experienced at the SPUI.

Lane Group	EBL	EBT	EBR2	WBL	WBT	WBR2	SEL	SER2	NWL	NWR2	Ø4	Ø8
Lane Configurations												
Traffic Volume (vph)	145	920	75	60	835	235	685	240	70	40		
Future Volume (vph)	145	920	75	60	835	235	685	240	70	40		
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	Perm	Prot	Perm		
Protected Phases	5	2		1	6		3		7		4	8
Permitted Phases			2			6		3		7		
Detector Phase	5	2	2	1	6	6	3	3	7	7		
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	5.0	5.0	5.0	7.0	7.0
Minimum Split (s)	15.0	27.0	27.0	15.0	27.0	27.0	15.5	15.5	15.0	15.0	35.0	35.0
Total Split (s)	21.0	52.9	52.9	15.0	46.9	46.9	42.1	42.1	17.0	17.0	35.0	60.1
Total Split (%)	14.5%	36.5%	36.5%	10.3%	32.3%	32.3%	29.0%	29.0%	11.7%	11.7%	24%	41%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.0	2.0
All-Red Time (s)	4.5	6.5	6.5	4.5	6.5	6.5	7.0	7.0	6.5	6.5	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	8.0	10.0	10.0	8.0	10.0	10.0	10.5	10.5	10.0	10.0		
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	23.2	60.5	60.5	12.6	49.9	49.9	43.3	43.3	37.0	37.0		
Actuated g/C Ratio	0.16	0.42	0.42	0.09	0.34	0.34	0.30	0.30	0.26	0.26		
v/c Ratio	0.58	0.72	0.15	0.44	0.75	0.57	0.74	0.41	0.09	0.09		
Control Delay	64.8	39.3	0.6	71.4	47.4	22.0	50.8	12.9	37.4	0.3		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	64.8	39.3	0.6	71.4	47.4	22.0	50.8	12.9	37.4	0.3		
LOS	E	D	A	E	D	C	D	B	D	A		
Approach Delay		40.0			43.4							
Approach LOS		D			D							

Intersection Summary	
Cycle Length: 145	
Actuated Cycle Length: 145	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green	
Natural Cycle: 145	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 40.9	Intersection LOS: D
Intersection Capacity Utilization 74.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 124: Hiawatha Av S SB Ramp & Hiawatha Av S NB Ramp & Lake St E



Lane Group	EBT	WBL	WBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	1065	60	905	685	0
Future Volume (vph)	1065	60	905	685	0
Turn Type	NA	pm+pt	NA	Prot	NA
Protected Phases	6	5	2	8	
Permitted Phases		2			8
Detector Phase	6	5	2	8	8
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	23.5	23.5	23.5	39.5	39.5
Total Split (s)	27.0	23.5	50.5	39.5	39.5
Total Split (%)	30.0%	26.1%	56.1%	43.9%	43.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	6.5	6.5
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	C-Max	None	C-Max	None	None
Act Effct Green (s)	35.8	46.3	46.3	31.7	31.7
Actuated g/C Ratio	0.40	0.51	0.51	0.35	0.35
v/c Ratio	0.64	0.29	0.54	0.89	0.80
Control Delay	24.9	18.5	10.5	47.0	31.7
Queue Delay	0.0	0.0	0.2	0.0	0.0
Total Delay	24.9	18.5	10.7	47.0	31.7
LOS	C	B	B	D	C
Approach Delay	24.9		11.2		39.6
Approach LOS	C		B		D

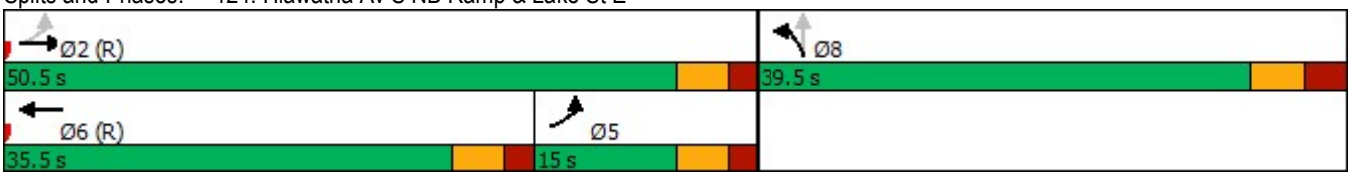
Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 66 (73%), Referenced to phase 2:WBTL and 6:EBT, Start of 1st Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 25.1	Intersection LOS: C
Intersection Capacity Utilization 91.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 3: Hiawatha Ave S SB Ramp & Lake St E

Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Traffic Volume (vph)	145	1605	895	0
Future Volume (vph)	145	1605	895	0
Turn Type	pm+pt	NA	NA	NA
Protected Phases	5	2	6	
Permitted Phases	2			8
Detector Phase	5	2	6	8
Switch Phase				
Minimum Initial (s)	5.0	10.0	10.0	7.0
Minimum Split (s)	15.0	32.5	32.5	39.5
Total Split (s)	15.0	50.5	35.5	39.5
Total Split (%)	16.7%	56.1%	39.4%	43.9%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	6.5
Lead/Lag	Lag		Lead	
Lead-Lag Optimize?	Yes		Yes	
Recall Mode	None	C-Max	C-Max	None
Act Effct Green (s)	69.7	69.7	54.7	8.3
Actuated g/C Ratio	0.77	0.77	0.61	0.09
v/c Ratio	0.38	0.65	0.43	0.49
Control Delay	6.0	4.2	9.4	19.0
Queue Delay	3.4	0.9	0.0	0.0
Total Delay	9.4	5.1	9.4	19.0
LOS	A	A	A	B
Approach Delay		5.4	9.4	19.0
Approach LOS		A	A	B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 8 (9%), Referenced to phase 2:EBTL and 6:WBT, Start of 1st Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 7.4	Intersection LOS: A
Intersection Capacity Utilization 91.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 124: Hiawatha Av S NB Ramp & Lake St E



Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route	CSAH 3	**District**	Metro	**County**	Hennepin County
Begin RP	14.19	**End RP**	14.25	**Miles**	0.06
Location	At: 22nd Ave				

B. Project Description

Proposed Work	CSAH 3: install additional primary signal head; 22nd Ave: install mast arms, improve intersection lighting		
Project Cost*	$5,659,400	**Installation Year**	2024
Project Service Life	20 years	**Traffic Growth Factor**	0.4%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

0.72	**Fatal (K) Crashes**	**Reference**	CMF 1414: Install additional primary signal head (28% reduction)
0.72	**Serious Injury (A) Crashes**		
0.72	**Moderate Injury (B) Crashes**	**Crash Type**	CMF 1414: RE & SS crashes along CSAH 3
0.72	**Possible Injury (C) Crashes**		
0.72	**Property Damage Only Crashes**		www.CMFclearinghouse.org

D. Crash Modification Factor (optional second CMF)

0.00	**Fatal (K) Crashes**	**Reference**	CMF 1420: Install mast arms (49% reduction)
0.00	**Serious Injury (A) Crashes**		CMF 1420: Improve intersection lighting (42% reduction)
0.51	**Moderate Injury (B) Crashes**	**Crash Type**	CMF 1420: RE, LT, RA, BIKE & PED along 22nd Ave
0.32	**Possible Injury (C) Crashes**		FHWA Desktop Reference: BIKE & PED nighttime crashes
0.47	**Property Damage Only Crashes**		www.CMFclearinghouse.org

E. Crash Data

Begin Date	1/1/2016	**End Date**	12/31/2018	3 years
Data Source	MnCMAT Version 2.0			

Crash Severity	CMF 1414: RE & SS crashes along CSAH 3	CMF 1420: RE, LT, RA, BIKE & PED along 22nd Ave FHWA Desktop Reference: BIKE & PED nighttime crashes
K crashes	0	0
A crashes	0	0
B crashes	0	1
C crashes	0	3
PDO crashes	6	6

F. Benefit-Cost Calculation

$2,382,249	**Benefit (present value)**
$5,659,400	**Cost**

B/C Ratio = 0.43

Proposed project expected to reduce 3 crashes annually, 0 of which involving fatality or serious injury.

F. Analysis Assumptions

Crash Severity	Crash Cost
K crashes	$1,360,000
A crashes	$680,000
B crashes	$210,000
C crashes	$110,000
PDO crashes	$12,000

Link: mndot.gov/planning/program/appendix_a.html

Real Discount Rate	1.2%
Traffic Growth Rate	0.4%
Project Service Life	20 years

G. Annual Benefit

Crash Severity	Crash Reduction	Annual Reduction	Annual Benefit
K crashes	0.00	0.00	$0
A crashes	0.00	0.00	$0
B crashes	0.49	0.16	$34,300
C crashes	2.03	0.68	$74,470
PDO crashes	4.88	1.63	$19,536
			$128,306

H. Amortized Benefit

Year	Crash Benefits	Present Value
2024	$128,306	$128,306
2025	$128,819	$127,292
2026	$129,335	$126,285
2027	$129,852	$125,287
2028	$130,371	$124,297
2029	$130,893	$123,314
2030	$131,416	$122,339
2031	$131,942	$121,372
2032	$132,470	$120,413
2033	$133,000	$119,461
2034	$133,532	$118,517
2035	$134,066	$117,580
2036	$134,602	$116,650
2037	$135,140	$115,728
2038	$135,681	$114,813
2039	$136,224	$113,906
2040	$136,769	$113,005
2041	$137,316	$112,112
2042	$137,865	$111,226
2043	$138,416	$110,346
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0

Total = $2,382,249

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route	CSAH 3	**District**	Metro	**County**	Hennepin County
Begin RP	14.26	**End RP**	14.39	**Miles**	0.13
Location	At: TH 55 (Hiawatha Ave)				

B. Project Description

Proposed Work	CSAH 3: add primary signal head, remove channelized turn islands & construct raised medians		
Project Cost*	$5,659,400	**Installation Year**	2024
Project Service Life	20 years	**Traffic Growth Factor**	0.4%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

0.00	**Fatal (K) Crashes**	**Reference**	CMF 8431: Improve the angle of RTs (60.3% reduction)
0.00	**Serious Injury (A) Crashes**		CMF 1417: Install primary signal head (28% reduction)
0.00	**Moderate Injury (B) Crashes**	**Crash Type**	CMF 8431: crashes involving right turning vehicles
0.51	**Possible Injury (C) Crashes**		CMF 1417: RE crashes involving EB vehicles
0.60	**Property Damage Only Crashes**		www.CMFclearinghouse.org

D. Crash Modification Factor (optional second CMF)

0.44	**Fatal (K) Crashes**	**Reference**	FHWA Desktop Reference: Install refuge island (56% reduction)
0.44	**Serious Injury (A) Crashes**		
0.44	**Moderate Injury (B) Crashes**	**Crash Type**	FHWA Desktop Reference: BIKE & PED crashes
0.44	**Possible Injury (C) Crashes**		
0.44	**Property Damage Only Crashes**		www.CMFclearinghouse.org

E. Crash Data

Begin Date	1/1/2016	**End Date**	12/31/2018	3 years
Data Source	MnCMAT Version 2.0			

Crash Severity	CMF 8431: crashes invovling RT veh CMF 1417: RE crashes	FHWA Desktop Reference: BIKE & PED crashes
K crashes	0	0
A crashes	0	0
B crashes	0	1
C crashes	3	1
PDO crashes	8	2

F. Benefit-Cost Calculation

$2,441,465	**Benefit (present value)**
$5,659,400	**Cost**

B/C Ratio = 0.44

Proposed project expected to reduce 3 crashes annually, 0 of which involving fatality or serious injury.

G. Analysis Assumptions

Crash Severity	Crash Cost
K crashes	$1,360,000
A crashes	$680,000
B crashes	$210,000
C crashes	$110,000
PDO crashes	$12,000

Link: mndot.gov/planning/program/appendix_a.html

Real Discount Rate	1.2%
Traffic Growth Rate	0.4%
Project Service Life	20 years

H. Annual Benefit

Crash Severity	Crash Reduction	Annual Reduction	Annual Benefit
K crashes	0.00	0.00	$0
A crashes	0.00	0.00	$0
B crashes	0.56	0.19	$39,200
C crashes	2.05	0.68	$74,983
PDO crashes	4.33	1.44	$17,312
			$131,495

I. Amortized Benefit

Year	Crash Benefits	Present Value
2024	$131,495	$131,495
2025	$132,021	$130,456
2026	$132,549	$129,425
2027	$133,080	$128,401
2028	$133,612	$127,386
2029	$134,146	$126,379
2030	$134,683	$125,380
2031	$135,222	$124,389
2032	$135,763	$123,406
2033	$136,306	$122,430
2034	$136,851	$121,463
2035	$137,398	$120,502
2036	$137,948	$119,550
2037	$138,500	$118,605
2038	$139,054	$117,667
2039	$139,610	$116,737
2040	$140,168	$115,814
2041	$140,729	$114,899
2042	$141,292	$113,990
2043	$141,857	$113,089
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0

Total = $2,441,465

CRASH MODIFICATION FACTORS CLEARINGHOUSE

CMF / CRF DETAILS

CMF ID: 1414

ADD SIGNAL (ADDITIONAL PRIMARY HEAD)

DESCRIPTION:

PRIOR CONDITION: INTERSECTION HAS ONE PRIMARY SIGNAL HEAD PER APPROACH

CATEGORY: INTERSECTION TRAFFIC CONTROL

STUDY: *SAFETY BENEFITS OF ADDITIONAL PRIMARY SIGNAL HEADS*, FELIPE ET AL., 1998

Star Quality Rating:	★★★☆☆ [VIEW SCORE DETAILS]

Crash Modification Factor (CMF)	
Value:	0.72
Adjusted Standard Error:	
Unadjusted Standard Error:	

Crash Reduction Factor (CRF)	
Value:	28 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	

Applicability	
Crash Type:	All
Crash Severity:	All
Roadway Types:	Not specified
Number of Lanes:	
Road Division Type:	
Speed Limit:	
Area Type:	Urban
Traffic Volume:	
Average Traffic Volume:	
Time of Day:	
If countermeasure is intersection-based	

Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	4-leg
Traffic Control:	Signalized
Major Road Traffic Volume:	
Minor Road Traffic Volume:	
Average Major Road Volume :	
Average Minor Road Volume :	

Development Details	
Date Range of Data Used:	
Municipality:	Richmond, British Columbia
State:	
Country:	Canada
Type of Methodology Used:	Before/after using empirical Bayes or full Bayes
Sample Size (sites):	8 sites after

Other Details	
Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	Dec-01-2009
Comments:	The authors state that "three year of data were used for this analysis" (p. 7). This statement does not indicate if the b was 3 years, the after period was 3 years, both were 3 years, or the total time period was 3 years (i.e. 1.5 years for bef and 1.5 years for after period).

VIEW THE FULL STUDY DETA

EXPORT DETAIL PAGE AS A P

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CRASH MODIFICATION FACTORS CLEARINGHOUSE

CMF / CRF DETAILS

CMF ID: 1417

ADD SIGNAL (ADDITIONAL PRIMARY HEAD)

DESCRIPTION:

PRIOR CONDITION: INTERSECTION HAS ONE PRIMARY SIGNAL HEAD PER APPROACH

CATEGORY: INTERSECTION TRAFFIC CONTROL

STUDY: *SAFETY BENEFITS OF ADDITIONAL PRIMARY SIGNAL HEADS*, FELIPE ET AL., 1998

Star Quality Rating:	★★★☆☆ [VIEW SCORE DETAILS]

Crash Modification Factor (CMF)	
Value:	0.72
Adjusted Standard Error:	
Unadjusted Standard Error:	

Crash Reduction Factor (CRF)	
Value:	28 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	

Applicability	
Crash Type:	Rear end
Crash Severity:	All
Roadway Types:	Not specified
Number of Lanes:	
Road Division Type:	
Speed Limit:	
Area Type:	Urban
Traffic Volume:	
Average Traffic Volume:	
Time of Day:	
If countermeasure is intersection-based	

Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	4-leg
Traffic Control:	Signalized
Major Road Traffic Volume:	
Minor Road Traffic Volume:	
Average Major Road Volume :	
Average Minor Road Volume :	

Development Details	
Date Range of Data Used:	
Municipality:	Richmond, British Columbia
State:	
Country:	Canada
Type of Methodology Used:	Before/after using empirical Bayes or full Bayes
Sample Size (sites):	8 sites after

Other Details	
Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	Dec-01-2009
Comments:	The authors state that "three year of data were used for this analysis" (p. 7). This statement does not indicate if the b was 3 years, the after period was 3 years, both were 3 years, or the total time period was 3 years (i.e. 1.5 years for bef and 1.5 years for after period).

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CRASH MODIFICATION FACTORS CLEARINGHOUSE

CMF / CRF DETAILS

CMF ID: 1420

CONVERT SIGNAL FROM PEDESTAL-MOUNTED TO MAST ARM

DESCRIPTION:

PRIOR CONDITION: EXISTING PEDESTALS WERE REMOVED AND REPLACED WITH MAST ARM SIGNALS

CATEGORY: INTERSECTION TRAFFIC CONTROL

STUDY: *SIGNALIZED INTERSECTIONS: INFORMATIONAL GUIDE*, RODEGERDTS ET AL., 2004

Star Quality Rating:	★★★☆☆ [VIEW SCORE DETAILS]

Crash Modification Factor (CMF)	
Value:	0.51
Adjusted Standard Error:	
Unadjusted Standard Error:	0.031

Crash Reduction Factor (CRF)	
Value:	49 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	3.1

Applicability	
Crash Type:	All
Crash Severity:	All
Roadway Types:	Not specified
Number of Lanes:	
Road Division Type:	
Speed Limit:	
Area Type:	
Traffic Volume:	
Average Traffic Volume:	
Time of Day:	All
If countermeasure is intersection-based	

Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	
Traffic Control:	Signalized
Major Road Traffic Volume:	
Minor Road Traffic Volume:	
Average Major Road Volume :	
Average Minor Road Volume :	

Development Details	
Date Range of Data Used:	
Municipality:	
State:	KS
Country:	usa
Type of Methodology Used:	Simple before/after
Sample Size (crashes):	809 crashes before, 412 crashes after

Other Details	
Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	Dec-01-2009
Comments:	

VIEW THE FULL STUDY DETA

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CRASH MODIFICATION FACTORS CLEARINGHOUSE

CMF / CRF DETAILS

CMF ID: 8431

IMPROVE ANGLE OF CHANNELIZED RIGHT TURN LANE

DESCRIPTION: CHANGES MADE TO THE STUDY APPROACHES INCLUDE: SHARPENING THE FLAT APPROACH ANGLE TYPICAL IN TRADITIONAL DESIGNS, REDUCING THE RADIUS, ADJUSTING THE STOP BAR POSITION, AND MODIFYING THE CO INCREASE THE LINE OF SIGHT OF APPROACHING THROUGH TRAFFIC.

PRIOR CONDITION: VARIED DEPENDING ON INTERSECTION

CATEGORY: INTERSECTION GEOMETRY

STUDY: *SAFETY IMPACTS OF A MODIFIED RIGHT TURN LANE DESIGN AT INTERSECTIONS*, SCHATTLER AND HANSON, 2016

Star Quality Rating:	★★★★☆ [VIEW SCORE DETAILS]

Crash Modification Factor (CMF)	
Value:	0.397
Adjusted Standard Error:	
Unadjusted Standard Error:	0.107

Crash Reduction Factor (CRF)	
Value:	60.3 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	10.7

Applicability	
Crash Type:	Right turn,Other
Crash Severity:	All
Roadway Types:	Not specified
Number of Lanes:	1 to 3
Road Division Type:	
Speed Limit:	
Area Type:	Not specified
Traffic Volume:	
Average Traffic Volume:	
Time of Day:	All
If countermeasure is intersection-based	

Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	Not specified
Traffic Control:	Other
Major Road Traffic Volume:	
Minor Road Traffic Volume:	
Average Major Road Volume :	
Average Minor Road Volume :	

Development Details	
Date Range of Data Used:	2003 to 2016
Municipality:	Peoria
State:	IL
Country:	USA
Type of Methodology Used:	Before/after using empirical Bayes or full Bayes
Sample Size (crashes):	161 crashes before, 45 crashes after
Sample Size (sites):	7 sites before, 7 sites after
Sample Size (site-years):	21 site-years before, 21 site-years after

Other Details	
Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	Jan-17-2017
Comments:	Crash type = "right turn related crashes at subject approach". Total intersection AADT ranged from 3300 to 41300. G intersections analyzed included both signalized and stop-controlled intersections.

VIEW THE FULL STUDY DETA

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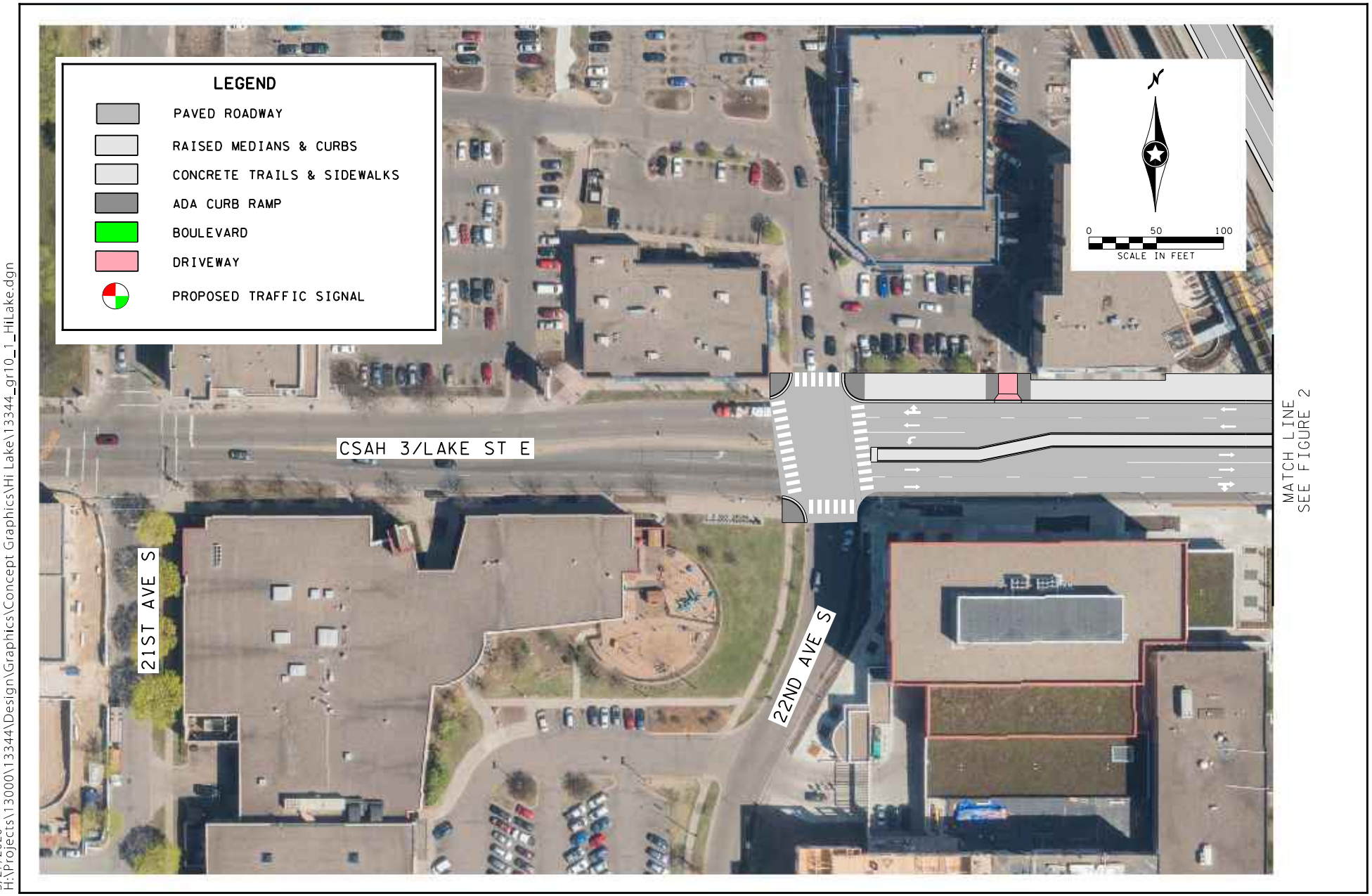
Countermeasure(s)	Crash Type	Crash Severity	Area Type	Config	Control	Major Daily Traffic Volume (veh/day)	Minor Daily Traffic Volume (veh/day)	Ref	Obs	Effectiveness: Crash Reduction Factor / Function	Effectiveness: Std Error	Effectiveness: Range Low	Effectiveness: Range High	Study Type
Prohibit right-turn-on-red (cont'd)	All	All	Urban/ Suburban		Signal			62		100(1-(0.984)^n); n=number of signalized intersection appraoches where RTOR is prohibited				Expert Panel
	Right-angle	All			Signal			15		30				Cross-section
	Sideswipe	All			Signal			15		20				Cross-section
Prohibit turns	All turns	All	All					1		45		40	90	
Restrict parking near intersections (to off-street)	All	All						28		49		8	90	
	Ped	All						15		30				
Vary speed	All	All	Rural					6		100(1-EXP(0.019(V-55))); V=major-road speed limit (or design speed) (mph)				
	All	All	Urban					6		100(1-EXP(0.005(V-40))); V=major-road speed limit (or design speed) (mph)				
LIGHTING														
Improve lighting at intersection	Ped	Fatal						5		78	87			
	Ped	Injury						5		**42**	18			
Install lighting	All	All			Signal			51		30				
	All	Fatal/Injury			Signal			51		17				
	Night	All			Signal			51		50				
	All	All			No Signal			28		47				
	All	All						62		4				Meta Analysis/ Expert Panel
	All	Injury						62		6				Meta Analysis/ Expert Panel
	Night	All						62		21				Meta Analysis/ Expert Panel
	Night	Injury						62		29				Meta Analysis/ Expert Panel

Countermeasures	Crash Type	Crash Severity	Area Type	Ref	Obs	Effectiveness				
						Crash Reduction Factor / Function	Std Error	Range		Study Type
								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

Attachment 4- Potential layout



Job #13344
3/27/2020
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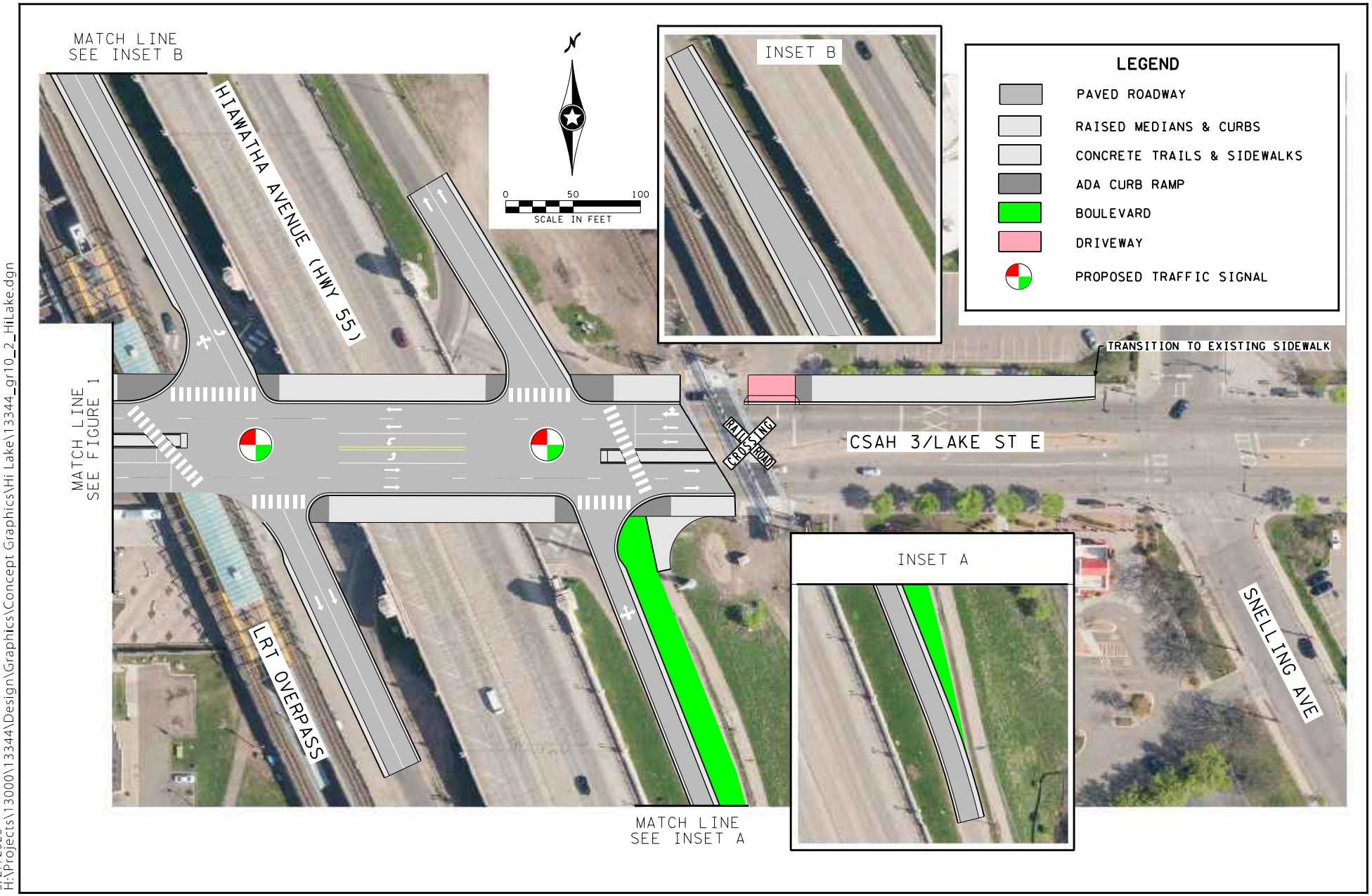
Hennepin County Improvements

CSAH 3 (Lake St E) from 22nd Ave S to Snelling Ave
Minneapolis, MN

Figure 1



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Hennepin County Improvements

CSAH 3 (Lake St E) from 22nd Ave S to Snelling Ave
Minneapolis, MN

Figure 2

Hi/Lake Interchange Safety Improvements

List of attachments

1. Project summary
2. Project photos – existing conditions
3. Project location map
4. Potential layout
5. Supporting documentation from Hennepin County planning documents
6. Supporting documentation from Minneapolis planning documents
7. CIP provisional project summary
8. Excerpts from Hi-Lake Interchange Study – Phase 1
9. Excerpts from Hi-Lake Interchange Study – Phase 2
10. Lake St level of congestion map
11. Franklin Ave level of congestion map
12. Socioeconomic equity map
13. Socioeconomic map
14. Affordable housing access map
15. Measures of effectiveness (MOE) report
16. Crash map and detail listing
17. Benefit cost worksheets and list of CMFs
18. Letters of support – Minneapolis and MnDOT

Project Scoping - Summary
Transportation Capital Projects

HENNEPIN COUNTY
MINNESOTA

Project Name
CSAH 3 (Lake St) Interchange Project

City(ies)
Minneapolis N/A N/A N/A

Commisioner Districts
4 N/A N/A

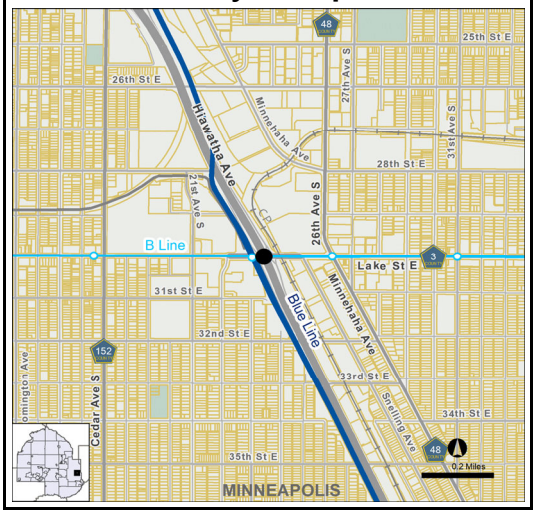
Capital Project Number
2155002

Project Category
Interchange

Scoping Manager
Robert Byers

Scoping Form Revision Dates
4/16/2020

Project Map



Project Summary
Reconstruct Lake Street (CSAH 3) at Hiawatha Avenue (TH 55) in the City of Minneapolis.

Roadway History
The existing interchange (constructed in the 1990s) at Lake Street (CSAH 3) and Hiawatha Avenue (TH 55) includes a design that's commonly referred to as a Single Point Urban Interchange (SPUI). This design combines all vehicle movements into one intersection that's controlled by a single traffic control system. This design is effective in minimizing vehicle delays at intersections that experience high left-turning demand, however, it's uninviting for people walking and biking. The Lake/Hiawatha SPUI is especially unique in that pedestrians are permitted to cross the arterial street (Lake Street), whereas, this crossing movement is typically prohibited at other locations where a SPUI is present (such as Lyndale Avenue/I-494 and Penn Avenue/I-494 in Bloomington and Richfield). Routine pedestrian crossing demand is generated at the Lake Street (CSAH 3) at Hiawatha Avenue (TH 55) interchange from two bus stops located on the west side. Additionally, the existing lighting underneath the interchange is poor, creating a sense of discomfort for people walking. Furthermore, an at-grade railroad crossing exists on the east approach of the interchange, further adding to the complexity of the area.

Project Description and Benefits
The proposed project will modify the existing geometry of the interchange to provide a tight-diamond design. Specifically, the channelized turn lanes will be revised in an effort to reduce vehicle speeds and provide more direct crossing routes for people walking. Furthermore, lighting upgrades will be included to improve user visibility, comfort, and security at the interchange.

MnDOT has identified a pavement project along Hiawatha Avenue (TH 55) in this area anticipated to occur in 2022. This project presents an opportunity to expand the scope of MnDOT's project and incorporate the desired interchange modifications.

Project Risks & Uncertainities
- The existing overpass of TH 55 may present sight distance challenges as it relates to signal head visibility

Anticpated Project Timeline

Scoping:	2015 - 2020
Design:	2021 - 2022
R/W Acquisition:	2021 - 2022
Bid Advertisement:	Q1 2023
Construction:	Q2 2023 - Q4 2023

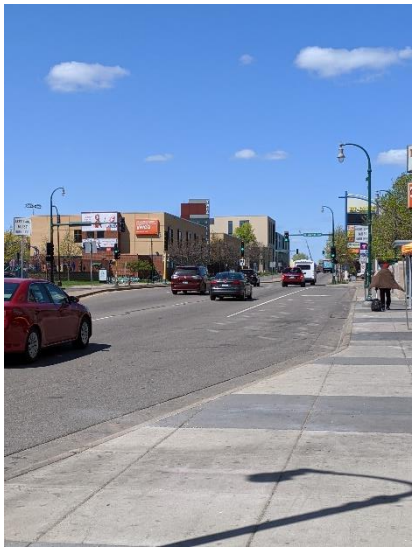
Project Delivery Responsibilities

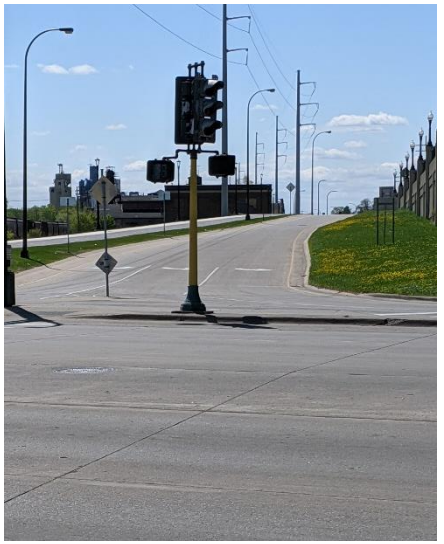
Preliminary Design:	MnDOT
Final Design:	MnDOT
Construction Services:	MnDOT

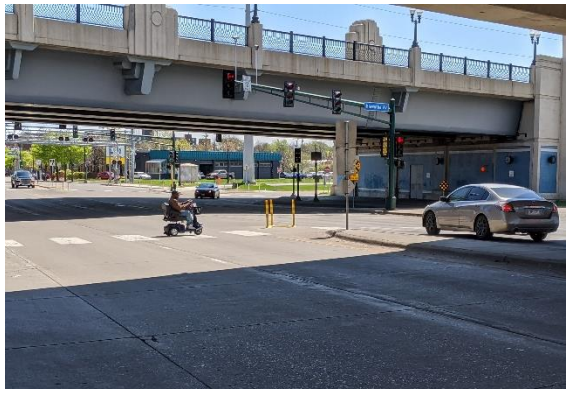
Project Budget -		Project Level
Construction:	$	4,350,000
Cost Estimate Year:		2020
Construction Year:		2023
Annual Inflation Rate:		3.0%
Inflated Construction:	$	4,750,000
Design Services:	$	710,000
R/W Acquisition:	$	-
Other (Utility Burial):	$	-
Construction Services:	$	480,000
Contingency:	$	1,310,000
Total Project Budget:	**$**	**7,250,000**

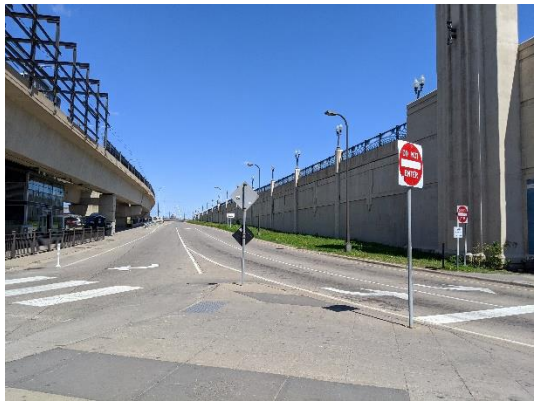
Funding Notes
- Eligible for federal funding through the Metropolitan Council's Regional Solicitation given the functional classification of CSAH 3 (A-Minor Arterial)

Attachment 2: Hi-Lake Existing Conditions – Photos





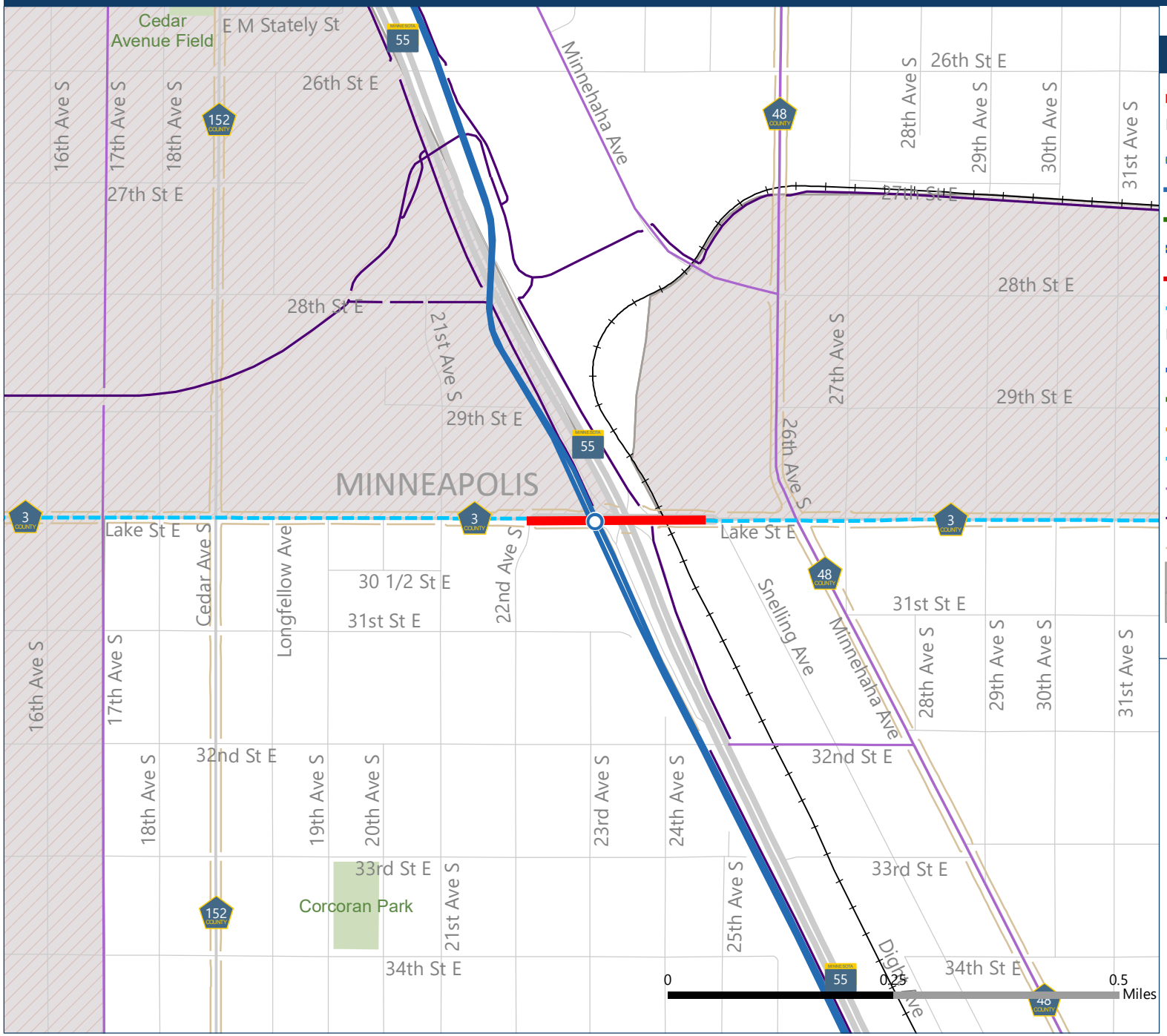




CSAH 3 (Lake St) Spot Mobility & Safety Project

Attachment 03 | Project Location Map

HENNEPIN COUNTY
MINNESOTA



Key

- Project (corridor)

Existing Transitways

- Blue / Green Line LRT
- Blue Line LRT
- Green Line LRT
- Northstar Line
- Red Line BRT
- Arterial BRT

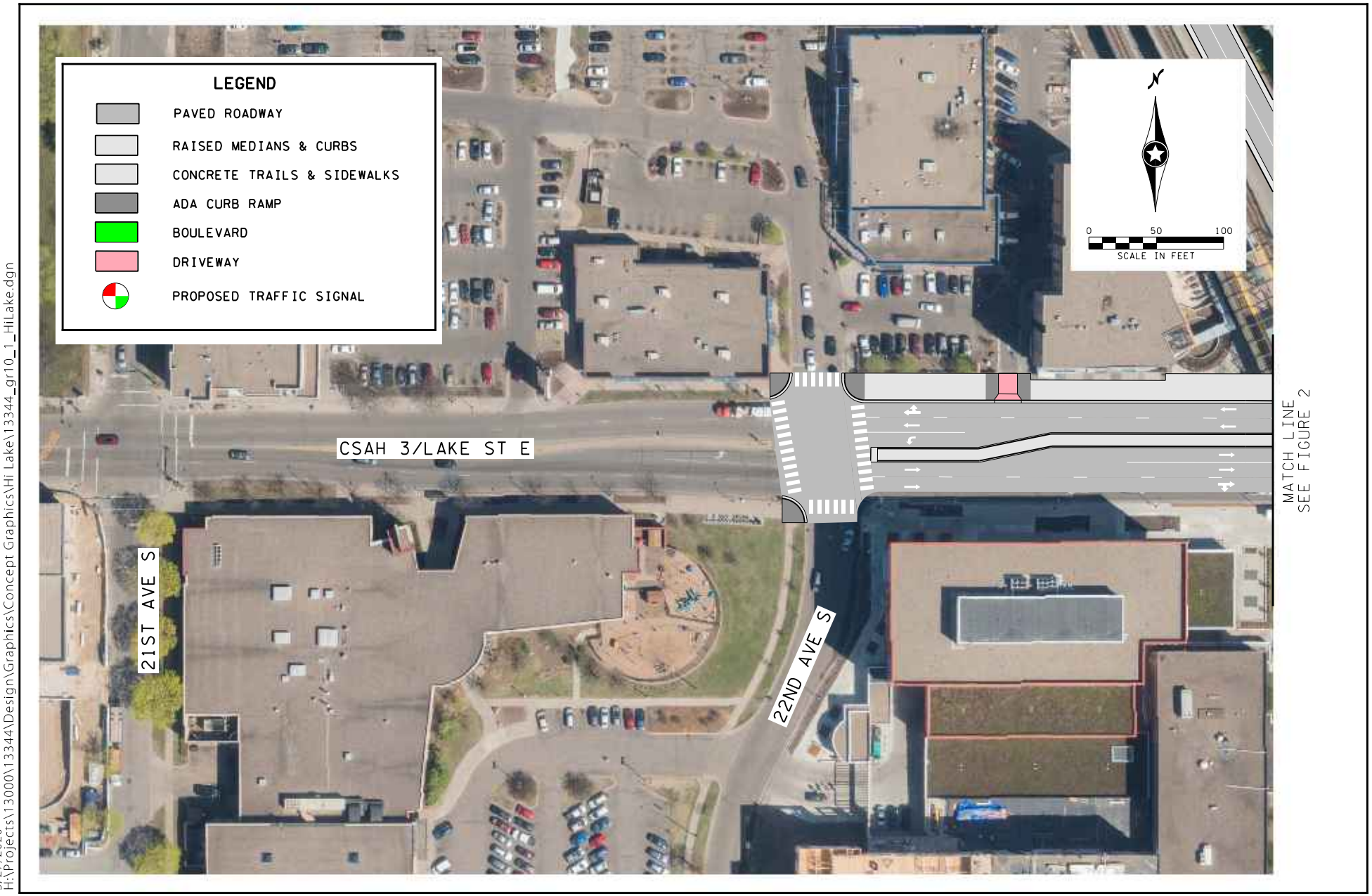
Planned Transitways

- Blue Line Extension LRT
- Green Line Extension LRT
- Orange Line BRT
- Arterial BRT
- On-street bikeway
- Off-street bikeway
- Sidewalks
- Areas of Concentrated Poverty (ACP)
- ACP & People of color > 50%

Published date: 4/20/2020

N

Attachment 4- Potential layout



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3/27/2020
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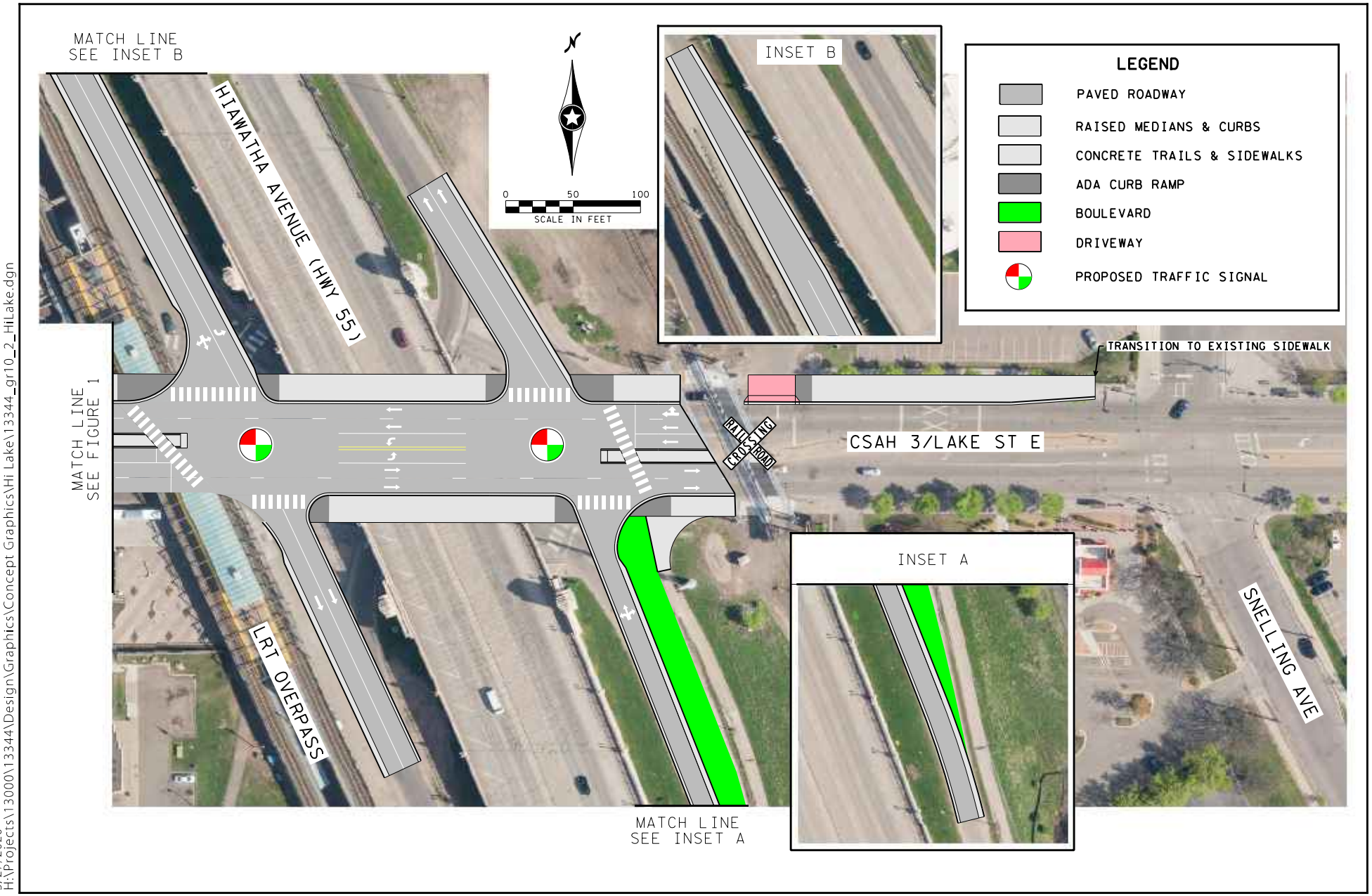
Hennepin County Improvements

CSAH 3 (Lake St E) from 22nd Ave S to Snelling Ave
Minneapolis, MN

Figure 1



Job #13344
3/27/2020
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Hennepin County Improvements

CSAH 3 (Lake St E) from 22nd Ave S to Snelling Ave
Minneapolis, MN

Figure 2

2 Goals of This Plan

The recommendations of this plan are guided by the following goals:

1. INCREASE THE SAFETY OF WALKING

Improving pedestrian safety is the primary goal of this plan. This plan includes strategies to promote safe behavior by pedestrians and motorists through improvements to pedestrian infrastructure along and across Hennepin County roads. This goal supports Hennepin County's goal to improve safety for all users of the transportation system.

Measures:

- Number of pedestrian-vehicle crashes
- Severity of pedestrian-vehicle crashes

2. INCREASE WALKING FOR TRANSPORTATION

Walking has the potential to replace short auto trips and is the primary means of access to public transit. This plan includes strategies to encourage walking by making it easier and more comfortable to walk. These strategies include improvements to pedestrian infrastructure, improvements to the planning and design process, and enhancing pedestrian connections to transit.

Measures:

- Miles of sidewalk and trail along county roadways
- Percent of county residents who walk to work
- Percent of county residents who walk to other destinations
- Annual pedestrian counts

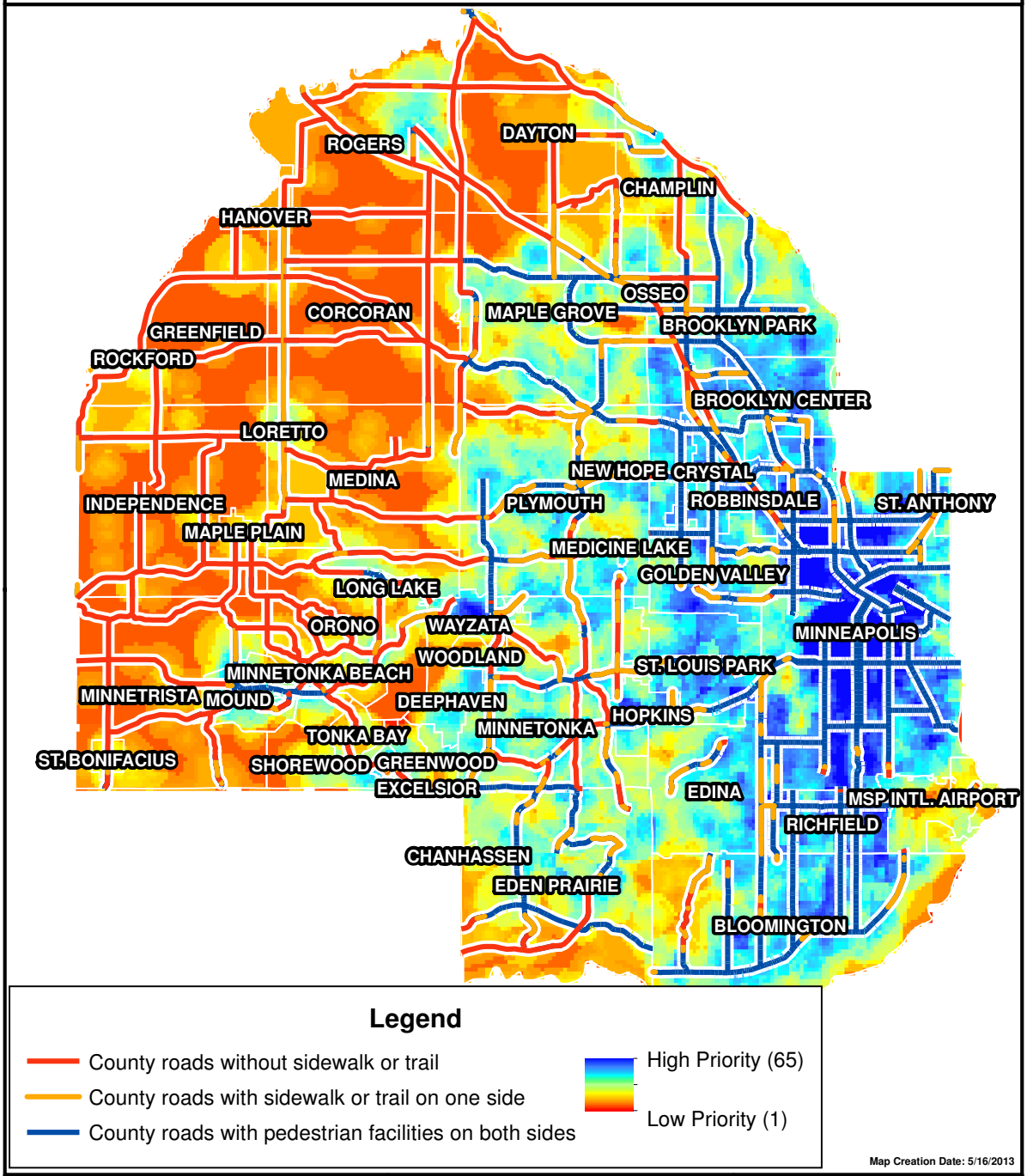
3. IMPROVE THE HEALTH OF COUNTY RESIDENTS

Walking for transportation and recreation is an easy way for children and adults to integrate regular physical activity into their routines. This plan prioritizes pedestrian projects, programs, and policies with the greatest potential to increase walking and in the geographic areas with the greatest needs for health improvements. Strategies under this goal also include Safe Routes to School programs and walking encouragement programs.

Measures:

- Percent of county residents who are overweight or obese

Priority Locations for Pedestrian Plan Implementation



The county and park district take great pride in the current bikeway system and will continue to improve it by pursuing the following goals:

RIDERSHIP GOAL

Promote the bicycle as a mode of transportation that is **practical, convenient, and pleasant** for commuting, health and exercise, and outdoor recreation.

BIKEWAY SYSTEM GOAL

Collaboratively build an **integrated county bicycle system** that allows bicyclists of varying skills to **safely, efficiently and comfortably connect** to and between all destinations within the county.

SAFETY AND COMFORT GOAL

Create a **safe and comfortable** county bikeway system.

SUSTAINABILITY GOAL

Implement bikeways and support facilities as an essential tool in **realizing environmental, social and economic sustainability**.

MAINTENANCE GOAL

Protect the county's and the park district's **investments** in the bikeway system and **reduce seasonal hazards** through partnerships.

By 2040, Hennepin County and Three Rivers Park District will…

Quadruple the number of **bicycle commuters** from 2010's 12,000 people to **48,000** people by 2040.

Halve bicycle crashes per capita from 2010 levels by 2040 and move **toward zero deaths** on bicycle.

Bring the ratio of **bike commuters** who are **women** to half.

Complete an average of **20 miles** of the bikeway system **each year**.

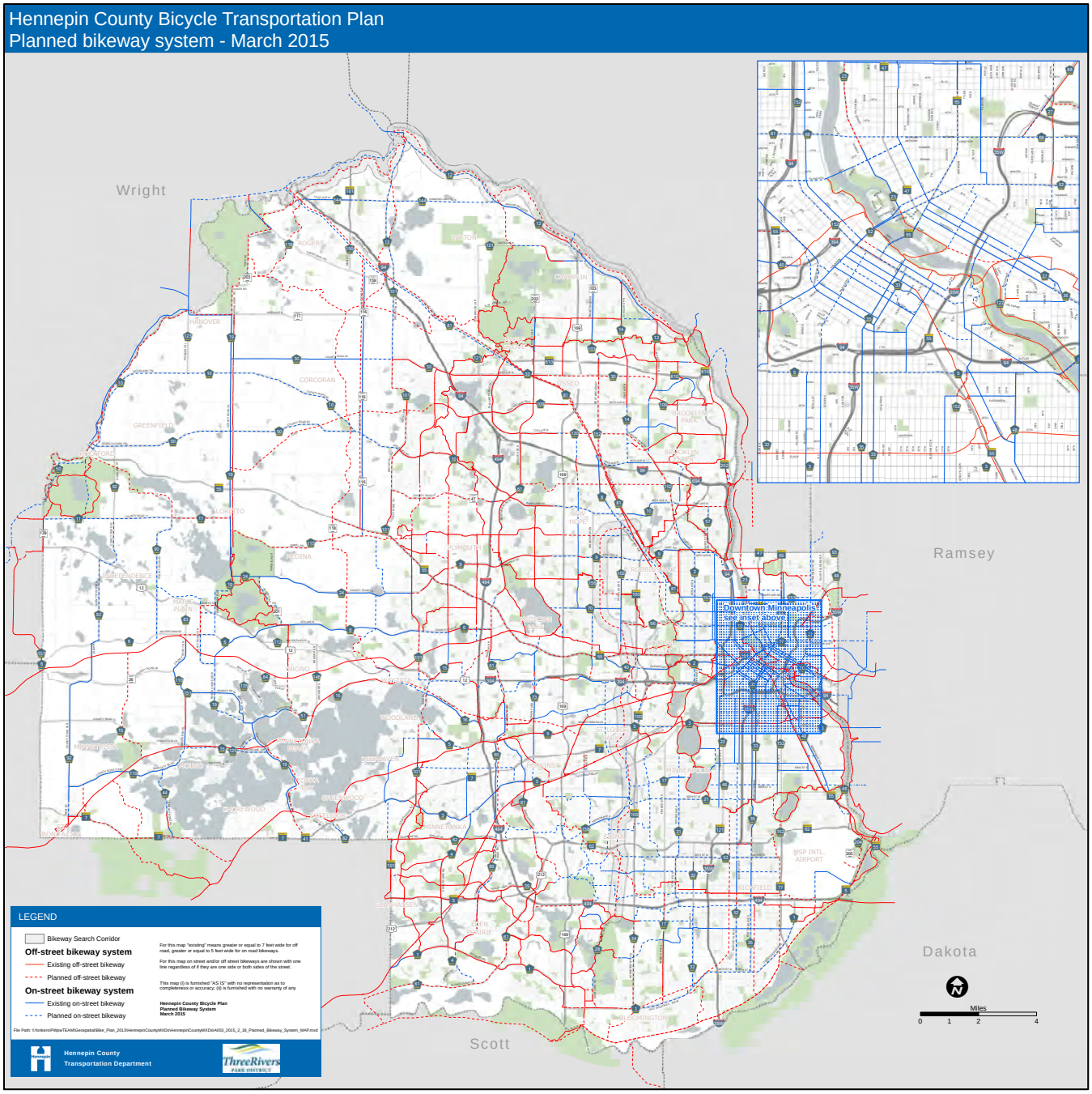
Will have a bikeway within **½ mile** of **90 percent** homes in Hennepin County.

Hennepin County 2040 Bikeway System

The existing bikeway system includes 651 miles of on- and off-street bikeways. The 2040 Bikeway System includes 540 miles of new planned bikeways, with almost half of the added system off-street. Implementing the 2040 Bikeway System will require ongoing political and public support to build an average of 20 miles of bikeway each year.

Table i: Annual mileage target for full system build-out

	Three Rivers Park District	Hennepin County	Planned system
Off-street bikeways	7.2	1.9	***9.1***
On-street bikeways		11.5	***11.5***
Total	***7.2***	***13.4***	***20.6***



Strategy 2.5	Actions
Work with transit partners early in the planning phase of corridor and station area planning to incorporate bicycle supportive facilities at key transit locations.	2.5.a Establish a communication protocol with key transit provider staff so county staff is aware of potential projects and can suggest ways to incorporate bicycle provisions in transit projects at the appropriate phase of project planning.
	2.5.b Provide guidance and resources for evaluating appropriateness of, and installing, bicycle repair stations and short/long-term bicycle storage options at major transit hubs.

Strategy 2.6	Actions
Work with transit providers and local communities to provide direct bicycle connections to transit stops and stations, and increase secure bicycle parking and storage to meet demand.	2.6.a Partner with transit agencies to identify transit/bicycle usage patterns (such as bike boardings, or bike parking use) to prioritize bicycle improvements that increase access to transit.
	2.6.b Consider prioritizing areas for bicycle improvements based on the percentage of lower income residents within a certain distance of the transit stop.
	2.6.c Include bikeway planning for major transit stations. Transitway and station area planning efforts should address bikeway system connections and support facilities.
	2.6.d Provide county funding eligibility for bikeway system connections and support facilities for major transit stations.

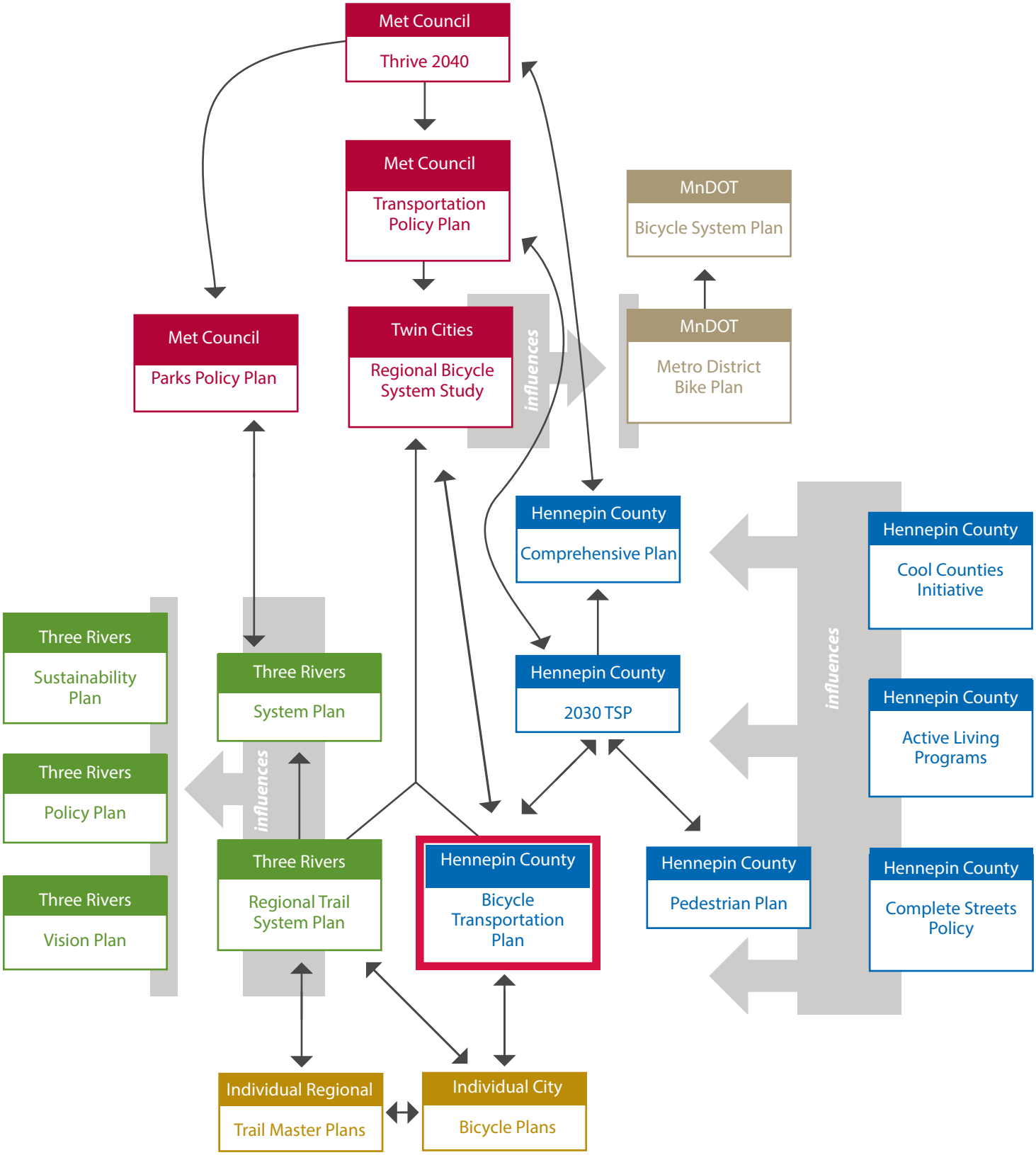


Figure 13: Policy framework

Figure 28: Pedestrian Priority Network

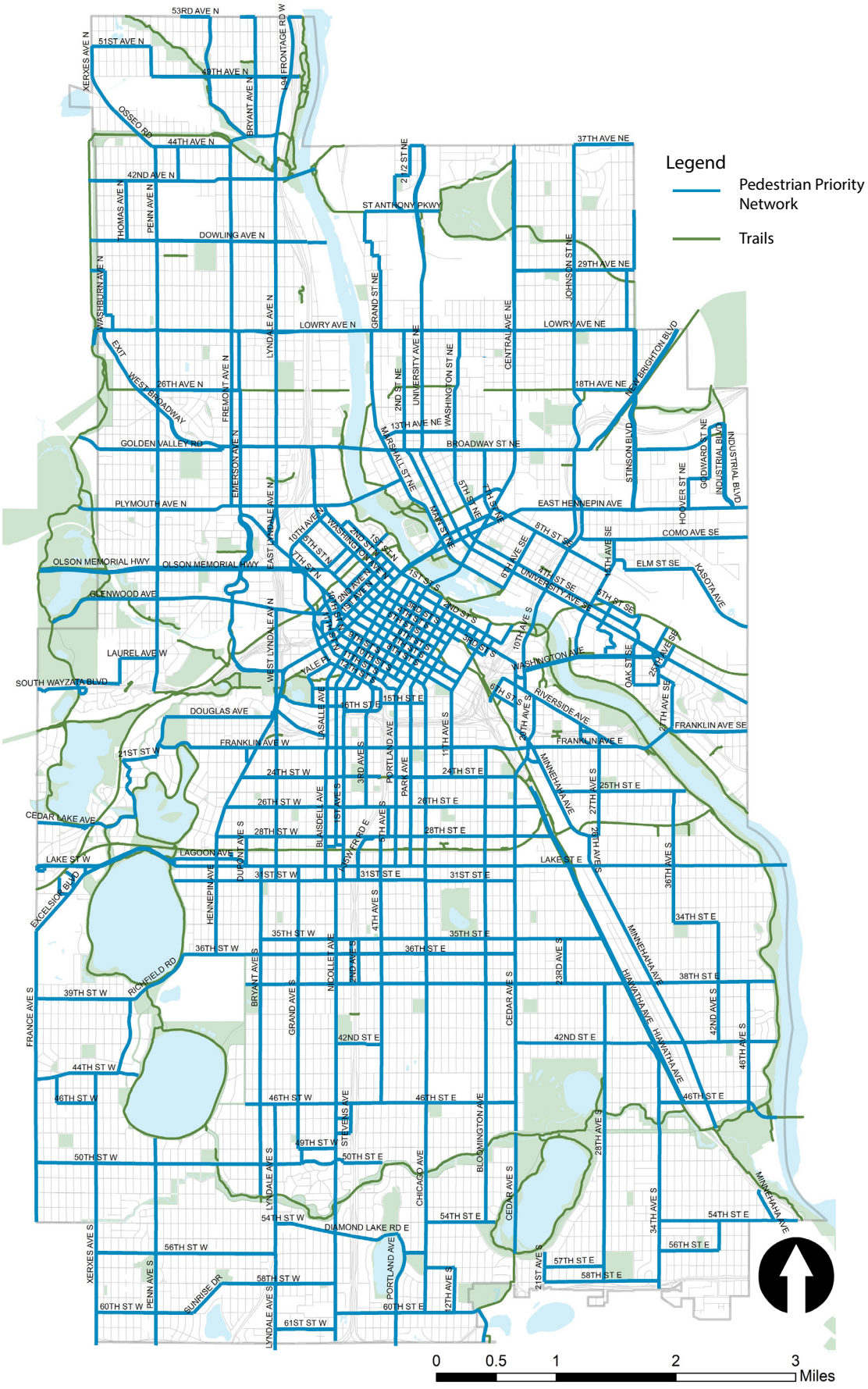


Figure 48: All Ages and Abilities Network

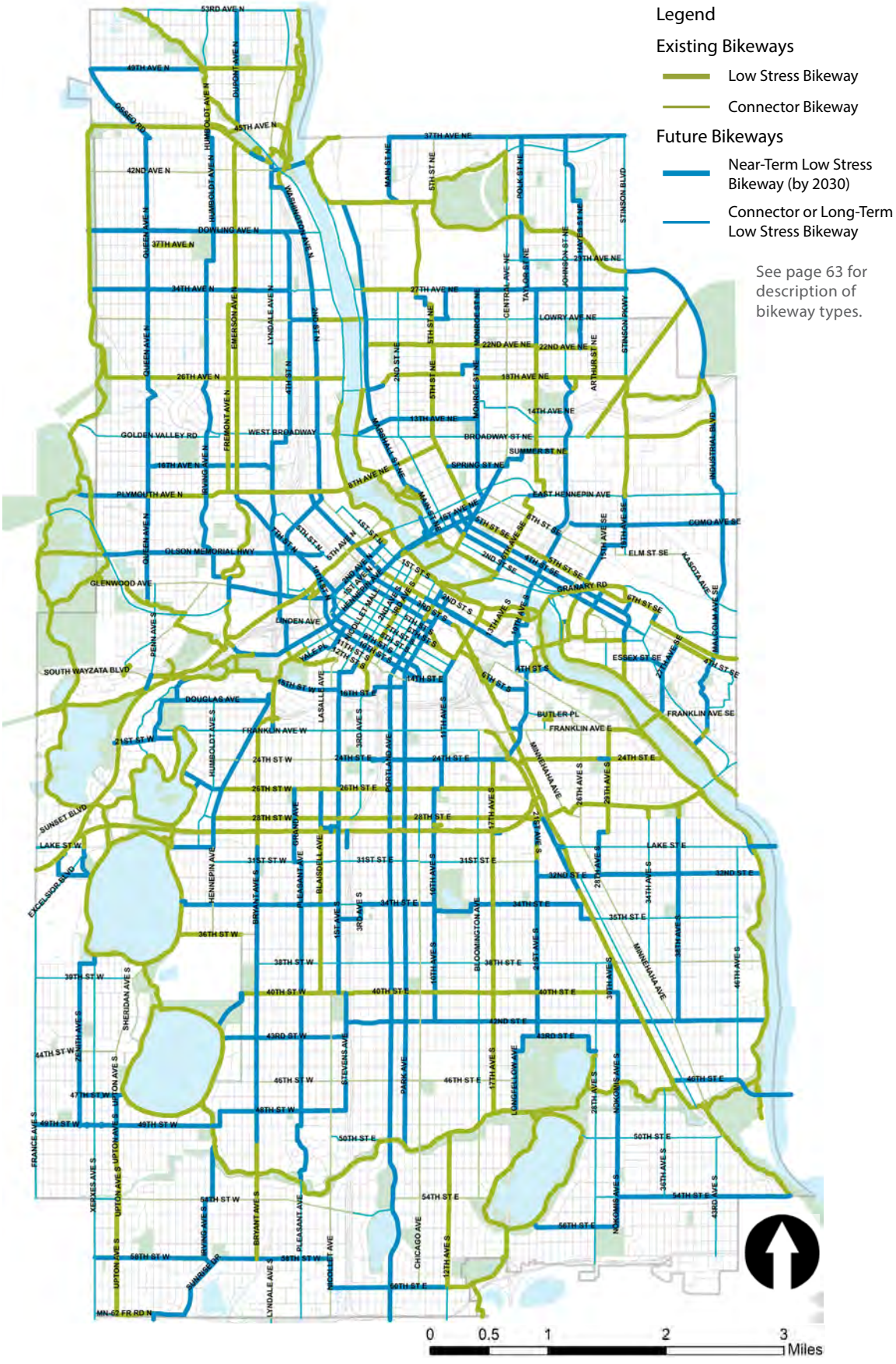
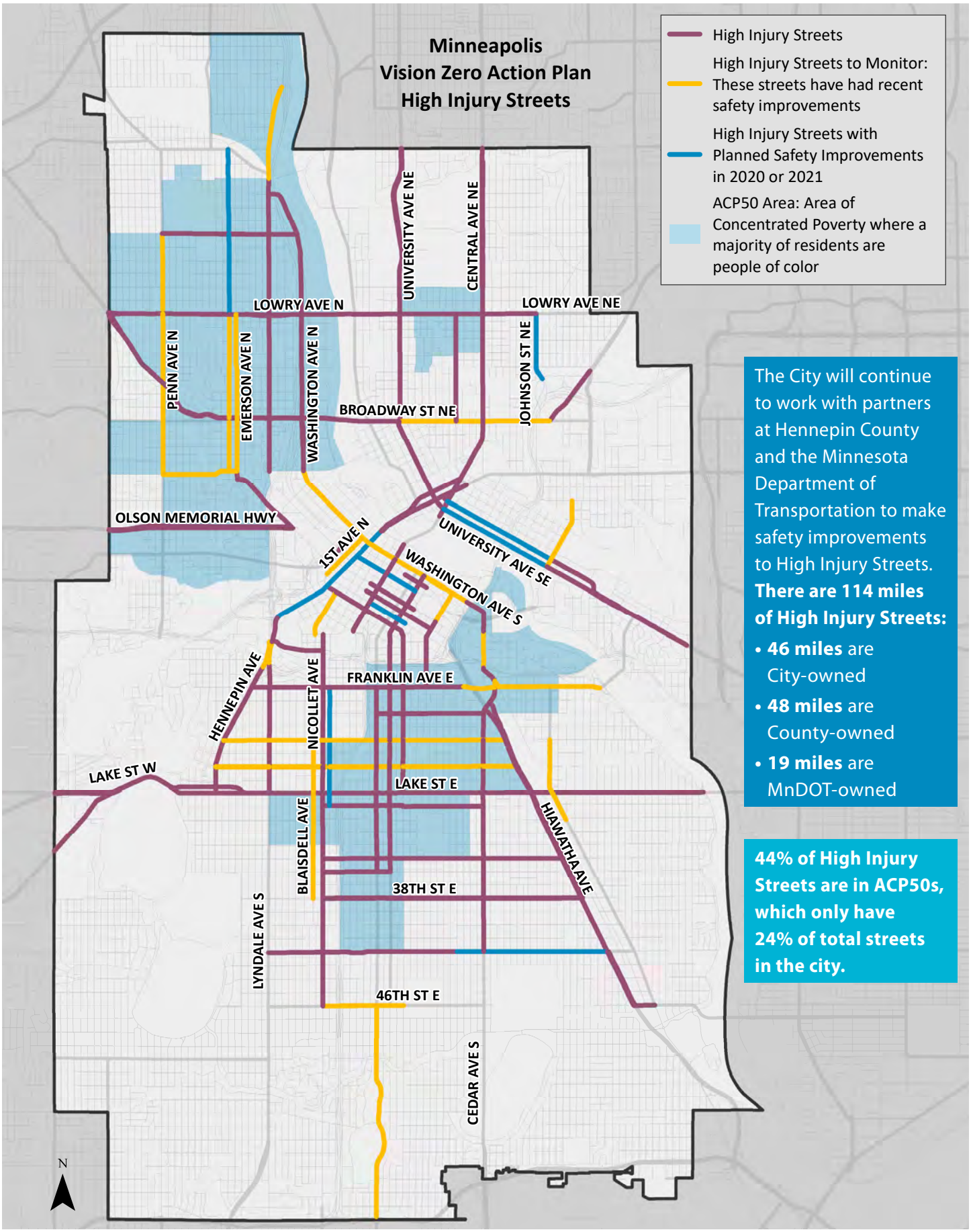


Figure 10: High Injury Streets



The City will continue to work with partners at Hennepin County and the Minnesota Department of Transportation to make safety improvements to High Injury Streets. **There are 114 miles of High Injury Streets:**

- **46 miles** are City-owned
- **48 miles** are County-owned
- **19 miles** are MnDOT-owned

44% of High Injury Streets are in ACP50s, which only have 24% of total streets in the city.

The crash density map in **Figure 5-7** provides a relative sense of the geographic distribution of crashes and is used as a background to the other infrastructure and street characteristics maps that follow. However, looking at hot spots alone only tells part of the story because the corridors and locations with more pedestrian crashes also have high volumes of users. Lake Street, Franklin Avenue, University Avenue SE/4th Street SE, and Penn Avenue N all have high numbers of cars, buses, bikes, and pedestrians, and all have high pedestrian crash numbers along their corridors.

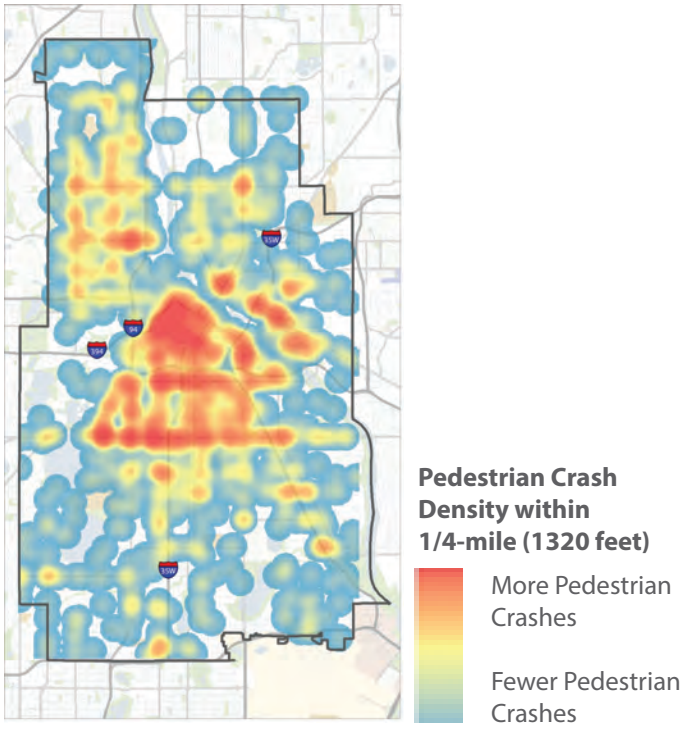


Figure 5-7. Pedestrian Crash Density

Source for Pedestrian Crash Data: 10-Year Dataset

Additionally, areas with tight intersection spacing – such as downtown Minneapolis – inherently will have more crashes per quarter mile, as multiple intersections and streets will fall within the density radius. A smaller density radius is useful to understand more intersection and block-specific trends and comparisons.

For additional insight on pedestrian crash density, a brief comparison of pedestrian, bicycle, and vehicle crash densities in Minneapolis was also conducted. Crash density maps provided by the City of Minneapolis show that the relative densities of crashes involving pedestrians, bicyclists, and vehicles alone have locational similarities. Most crashes among all three crash types occur in the urban core of the city where streets, intersections, and people are more densely situated. However, while pedestrian and vehicle-alone crashes are more widely distributed throughout the city, bicycle crashes are more concentrated around the urban core. Bicycle, pedestrian, and vehicle crash density heat maps are provided in **Appendix D**.

Sidewalk Gaps

Eight percent of the linear miles of city streets are considered to have a sidewalk gap because they do not have sidewalks on one or both sides of the street. However, only four percent of the pedestrian crashes happened on streets that have sidewalk gaps. This underrepresentation of pedestrian crashes on streets with sidewalk gaps is not surprising; areas without sidewalks are primarily in industrial areas that do not have significant pedestrian activity.

However, there are six sidewalk gap segments that had three or more pedestrian crashes on or near the segment over the 10 years analyzed. These streets and intersections do have significant pedestrian or vehicular activity and likely warrant further consideration for pedestrian infrastructure:

- Seven intersection pedestrian crashes have occurred at the I-35W frontage road and University Ave SE or 4th Street SE*
- Six pedestrian crashes - five intersection related and one midblock - have occurred along the Willow Street sidewalk gap at Loring Park
- Five intersection pedestrian crashes have occurred at Huron Boulevard and Fulton Street
- Four intersection pedestrian crashes have occurred at University Avenue NE and 37th Avenue NE
- Four pedestrian crashes - one midblock and three intersection related - have occurred along Butler Place near Riverside Avenue
- Three pedestrian crashes have occurred at the northbound entrance ramp to Hiawatha Avenue from Lake Street**

*This intersection and area present a unique challenge of accommodating high volumes of turning vehicles to and from the freeway ramps alongside high numbers of students walking through and living in the area. While many of the crashes at these intersections may not be directly related to the sidewalk gap itself, missing sidewalk connectivity through this busy area is worth noting.

**Two of the three crashes at this interchange involved vehicles making right turns onto Hiawatha Avenue. This suggests that the issue is likely the free-right movement, not the lack of a sidewalk on the entrance ramp.

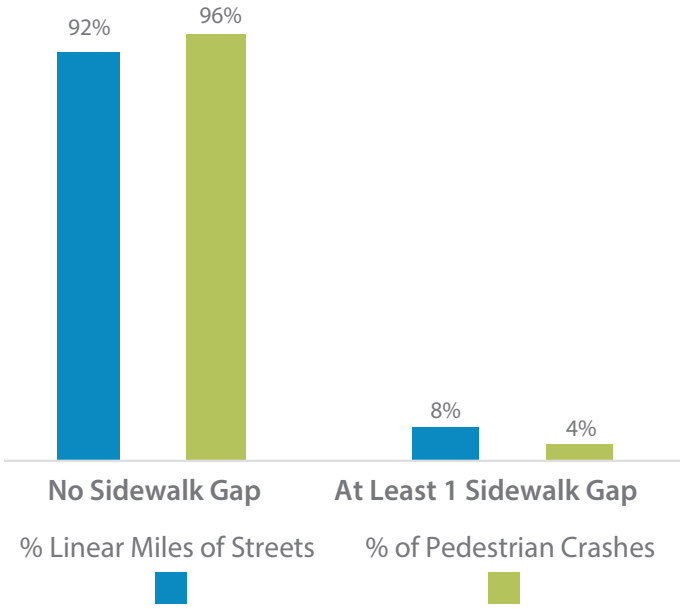


Figure 5-15. Pedestrian Crashes and Sidewalk Gaps

Source for Pedestrian Crash Data: 10-Year Dataset
Source for Sidewalk Gap Data: Pedestrian Master Plan (2009)

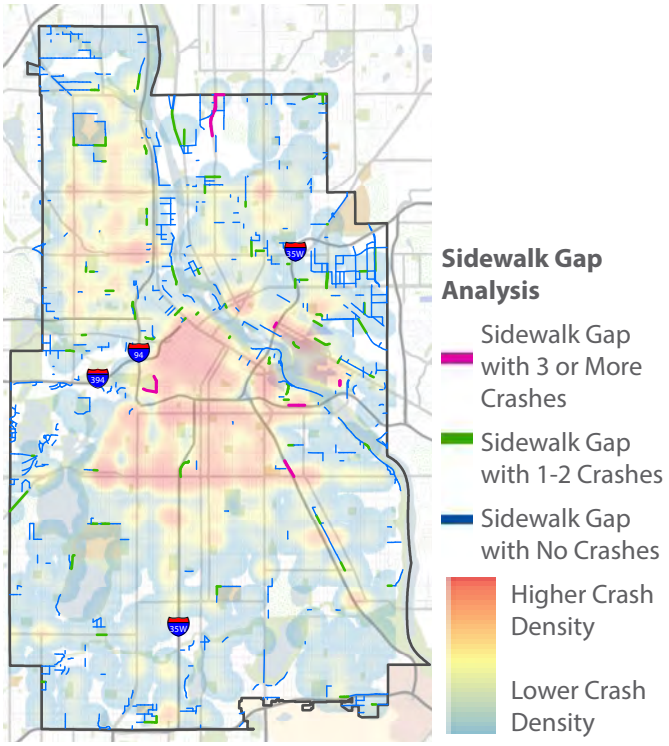


Figure 5-16. Pedestrian Crash Trends by Sidewalk Gaps

Source for Pedestrian Crash Data: 10-Year Dataset
Source for Sidewalk Gap Data: Pedestrian Master Plan (2009)

Crashes at State Highway Intersections

The Minnesota Department of Transportation (MnDOT) owns and maintains several trunk highways through the City of Minneapolis. These are typically some of the highest volume streets in the City of Minneapolis. Some examples include Hiawatha Avenue and Olson Memorial Highway (TH 55) and freeway on- and off-ramps to I-35W, I-94, and I-394. The intersections with the most pedestrian crashes on state roads are shown in **Table C-7** and intersections with the highest crash rates are shown in **Table C-8**.

Table C-7. State 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	4th St SE	Central Ave SE	14	0.13	28,700
2	Lowry Ave NE	Central Ave NE	11	0.11	26,500
3	2nd St S	3rd Ave S	10	0.18	15,675
4	4th St N	2nd Ave N	10	0.13	21,380
5	Washington Ave S	3rd Ave S	8	0.07	33,550
6	University Ave SE	Central Ave SE	6	0.07	23,350
7	Washington Ave S	I-35W SB Ramp	6	0.05	34,090
8	University Ave SE	I-35W NB Ramp	5	0.06	24,650
9	Fulton St SE	Huron Blvd SE	5	0.05	30,558
10	37th Ave NE	University Ave NE	4	0.05	20,850
11	10th St S	5th Ave S	4	0.04	25,600
12	Hennepin Ave E	University Ave NE	4	0.04	28,450
13	3rd St N	2nd Ave N	4	0.04	29,000
14	Lake St E	Hiawatha Ave S SB Ramp	4	0.04	30,160
15	42nd St E	Hiawatha Ave S	4	0.03	32,050
16	38th St E	Hiawatha Ave S	4	0.03	35,150
17	3rd Ave NE	University Ave NE	3	0.05	15,215
18	26th Ave NE	Central Ave NE	3	0.05	15,900
19	24th Ave NE	Central Ave NE	3	0.05	16,200

Source for Pedestrian Crash Data: 10-Year Database
Source for Vehicle Volume Data: City of Minneapolis

Project Name: 2155002 CSAH 3 - Reconstruct Lake St at Hiawatha Ave (TH 55)
Major Program: Transportation Provisional Projects
Department: Transportation Provisional Roads & Bridges Projects

Funding Start: Beyond 2024
Funding Completion: Beyond 2024

Summary:

Reconstruct Lake Street (CSAH 3) at Hiawatha Avenue (TH 55) in the City of Minneapolis.

Purpose & Description:

The existing interchange (constructed in the 1990s) at Lake Street (CSAH 3) and Hiawatha Avenue (TH 55) includes a design that's commonly referred to as a Single Point Urban Interchange (SPUI). This design combines all vehicle movements into one intersection that's controlled by a single traffic control system. This design is effective in minimizing vehicle delays at intersections that experience high left-turning demand, however, it's uninviting for people walking and biking. The Lake/Hiawatha SPUI is especially unique in that pedestrians are permitted to cross the arterial street (Lake Street), whereas, this crossing movement is typically prohibited at other locations where a SPUI is present (such as Lyndale Avenue/I-494 and Penn Avenue/I-494 in Bloomington and Richfield). Routine pedestrian crossing demand is generated at the Lake Street (CSAH 3) at Hiawatha Avenue (TH 55) interchange from two bus stops located on the west side. Additionally, the existing lighting underneath the interchange is poor, creating a sense of discomfort for people walking. Furthermore, an at-grade railroad crossing exists on the east approach of the interchange, further adding to the complexity of the area.

The City of Minneapolis, Hennepin County, MnDOT, and Metro Transit began evaluating the interchange in 2014. A feasibility study was completed in 2016 that included public engagement, concept analysis, and preliminary cost estimates. The various concepts provided in the study ranged from short-term improvements ($500,000) to long-term ($5,000,000). In 2017, a Phase II feasibility study began that continued where previous evaluations left off. Staff anticipates that the preferred option from the Phase II feasibility study will be the conversion of the SPUI design to a tight-diamond design to provide a more traditional interchange.

The proposed project will modify the existing geometry of the interchange to provide a tight-diamond design. Specifically, the channelized turn lanes will be revised in an effort to reduce vehicle speeds and provide more direct crossing routes for people walking. Furthermore, lighting upgrades will be included to improve user visibility, comfort, and security at the interchange.

MnDOT has identified a pavement project along Hiawatha Avenue (TH 55) in this area anticipated to occur in 2022. This project presents an opportunity to expand the scope of MnDOT's project and incorporate the desired interchange modifications.

This is a provisional project dependent upon the availability of funding.

Revenue for this project has not yet been entered into the CIP.

EXPENSE	Budget To-Date	12/31/19 Act & Enc	Balance	2020 Budget	2021	2022	2023	2024	Beyond 2024	Total
Construction									1,500,000	1,500,000
Total									**1,500,000**	**1,500,000**

Project Name: 2155002 CSAH 3 - Reconstruct Lake St at Hiawatha Ave (TH 55)
Major Program: Transportation Provisional Projects
Department: Transportation Provisional Roads & Bridges Projects

Funding Start: Beyond 2024
Funding Completion: Beyond 2024

Current Year's CIP Process Summary	Budget To-Date	2020 Budget	2021	2022	2023	2024	Beyond 2024	Total
Department Requested								
Administrator Proposed								
CBTF Recommended								
Board Approved Final								

Scheduling Milestones (major phases only):

Board Resolutions / Supplemental Information:

Project's Effect on Annual Operating Budget:

Additional planning and design work is required to determine the impact to Transportation Department staff or annual operating costs anticipated by this project.

Environmental Impacts and Initiatives:

Changes from Prior CIP:

- No changes since the 2019-2023 Transportation Capital Improvement Program.

Last Year's CIP Process Summary	Budget To-Date	2019	2020	2021	2022	2023	Beyond 2023	Total
Department Requested								
Administrator Proposed								
CBTF Recommended								
Board Approved Final								

1.0 OVERVIEW OF STUDY

1.1. Need

The Hiawatha-Lake (Hi-Lake) interchange serves approximately 34,000 vehicles, 2,500 pedestrians and bikes, 350 Metro Transit buses, and 5 freight trains per day. An additional 220 light rail trains and 37,000 vehicles per day travel overhead on Hiawatha Avenue (Trunk Highway 55). Serving all of these modes and improving the pedestrian and bicycling environment through the area has been a growing priority, particularly given the significant investments in transit and transit-oriented development over the last decade.

In response to recent constituent concerns, a group of policy makers from the City of Minneapolis, Hennepin County, and MnDOT visited the interchange and met with neighborhood residents to discuss the pedestrian and bicycle environment. The group agreed that while the pedestrian environment clearly needs improvement, there is no simple or obvious solution to do so. The intersection is busy, large, and currently auto-oriented, despite good transit connectivity and high pedestrian volumes. All modes need to be considered as various improvements are evaluated.

1.2. Purpose

The purpose of this study is to develop potential solutions to improve the pedestrian and bicycle environment of the Hi-Lake interchange while maintaining vehicle operations on Lake Street and Hiawatha Avenue. Although the study is being led by the City of Minneapolis and Hennepin County, Metro Transit and the Minnesota Department of Transportation also played crucial roles providing insight on the potential improvement alternatives. At the time of this study, no participating agencies have programmed projects or improvements in their capital improvement programs.

While improving the pedestrian environment was the primary driver of the study, several multimodal goals emerged through the process, as summarized below:

- Improve pedestrian and bicyclist comfort, safety, and security, and minimize delay at signals
- Ensure the roadway configuration supports all transit movements and facilitates efficient transit operations
- Reallocate right-of-way from vehicle lanes to sidewalk space where feasible to accommodate improved transit infrastructure, including arterial bus rapid transit stations
- Create a dedicated connection between nearby bicycle trails and the Blue Line Lake Street Station

The neighborhood has also expressed a goal of improving the aesthetics of the interchange area through public art and streetscape. This report presents the technical analysis of transportation options that were studied and identifies new pedestrian spaces that could be created by those options. However, a more detailed study and public process would be needed to explore how existing and new pedestrian spaces may be activated through art or other treatments.

This report outlines the existing conditions that drive the need for improvements and identifies a menu of improvements that can be implemented in phases without significant interchange reconstruction, as well as evaluating five alternatives that would significantly reconfigure the interchange. The study documents the key technical considerations for a variety of solutions in the area; informing potential improvements, funding sources, and implementation timeline.

1.3. Previous Studies

Historical summary

The Hiawatha Avenue/Lake Street intersection was grade separated in the 1990s. The single point urban interchange (SPUI) that currently exists was constructed at that time.

Hi-Lake Pedestrian Connectivity Project (2006-2007)

This study recommended multiple modifications to improve the pedestrian experience, including

- shortening crossings by adding or enlarging islands
- public art
- lighting

While the implementation of the modified islands shortened the crossing distances in some cases, the pedestrian routes became less direct and pedestrians remain exposed while waiting on the islands, contributing to the overall perception of poor safety in the area.

Hiawatha LRT Trail Extension Study (2012)

This study identified improvements to connect the Midtown Greenway to Lake Street, planned for construction in 2018.

Arterial Transitway Corridor Study (2011-2012)

Metro Transit studied Lake Street and other urban corridors with high-ridership bus routes that connect major destinations for implementation of enhanced bus service. The interchange at Lake Street and Hiawatha Avenue was identified as a station location for the Lake Street Arterial Bus Rapid Transit (arterial BRT) Line in this study. The arterial BRT Line is scheduled to open by 2022, but the project is not yet funded.

Midtown Corridor Alternatives Analysis (2012-2014)

This transit alternatives analysis identified streetcar on the Midtown Greenway and enhanced bus on Lake Street as the preferred alternative of the several studied alternatives.

Others

Hennepin County is involved in the development of the property in the southwest quadrant of the interchange, which will include a Hennepin County Service Center as well as housing and office space. Metro Transit is also participating in this work and is looking to improve street access from the site and LRT/bus access on Lake Street. There is a proposed bicycle facility through the development.

1.4. Study Process

The Hi-Lake Interchange Study took place over four months from October 2015 to January 2016. Three Project Management Team (PMT) meetings were held during the course of the study to discuss technical analysis, including data, improvement alternatives, evaluation of alternatives and cost estimates. The goal of the study was to conduct the technical analysis and design needed to evaluate the feasibility of improvement alternatives. From there, input from policy makers and the public will be needed on the feasible alternatives to determine the phasing of improvement implementation.

2.0 EXISTING CONDITIONS

2.1. Operations

The existing interchange at Hiawatha Avenue (Trunk Highway 55) and Lake Street (Hennepin County Road 3) is referred to as a Single Point Urban Interchange (SPUI). Unlike more traditional diamond interchanges that include two closely spaced intersections where the ramps intersect the arterial street, SPUI interchanges combine all movements into one intersection and have one signal that controls all movements. The SPUI design is a particularly effective for minimizing vehicle delays at high-volume interchanges with significant left turn demand, as opposing left turn movements operate concurrently. The wide, gradual turns also better accommodate heavy vehicles when compared to a tight diamond interchange. However, the size of the interchange makes it auto-oriented and requires longer yellow and red phase times than typical intersections, leading to some operational inefficiencies in terms of lost green time.

Figure 2-1: The Hi-Lake interchange study area within the City of Minneapolis

As SPUIs are typically installed in the context of large freeways, accommodating pedestrian and bicycles is not a typical priority. In fact, it is common for SPUIs to only serve pedestrians along the arterial, and unlike the Hi-Lake interchange, where a pedestrian phase is provided to cross Lake Street, several other SPUIs in the Twin Cities area at I-494/Penn Avenue and I-494/Lyndale Avenue do not provide a pedestrian phase to cross the arterial. Even with a pedestrian phase, however, the size and complexity of the design typically creates an uninviting pedestrian and bicycling environment.

2.2. Geometry

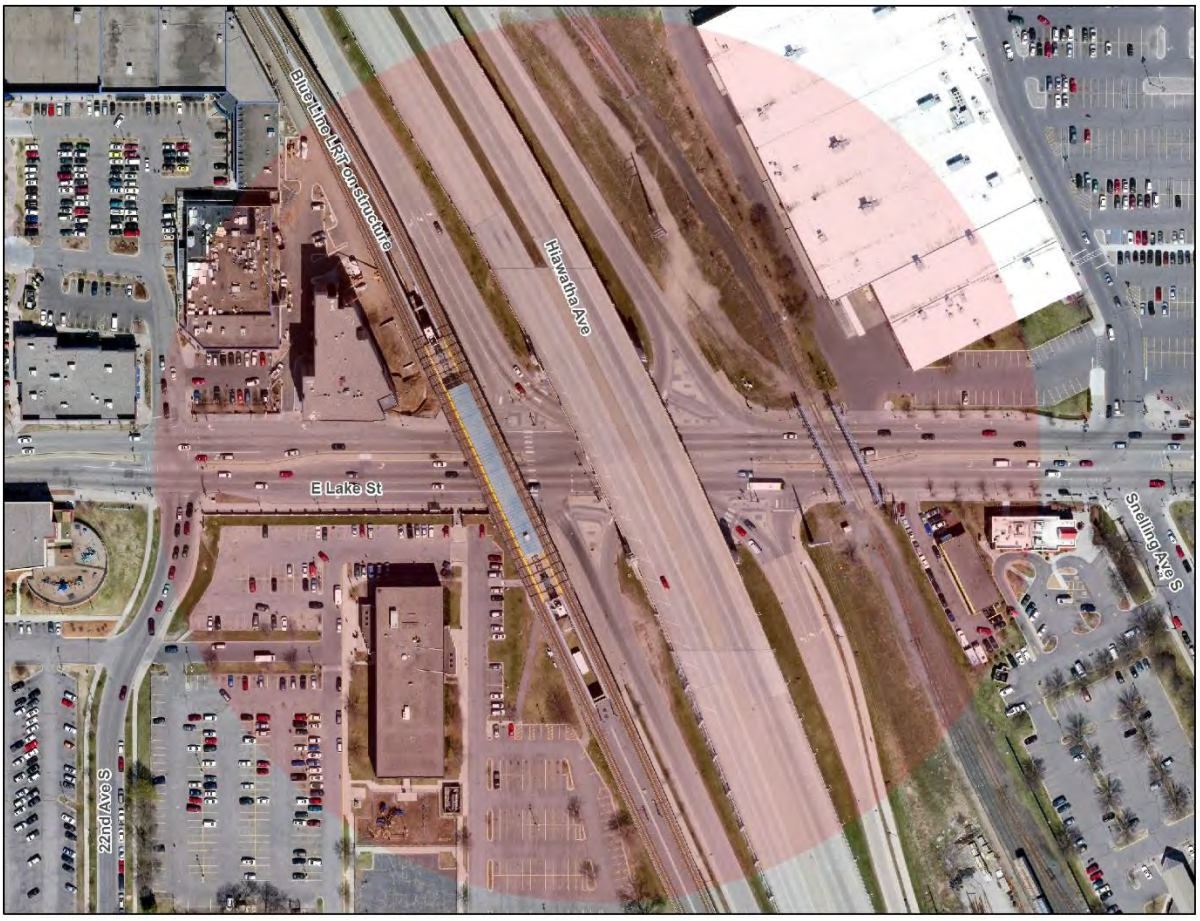


Figure 2-2: Existing geometry at the HiLake interchange

Lake Street is generally a four-lane, two-way roadway, widening in the Hi-Lake interchange area with designated left- and right- turn lanes in both directions. Two bridges span over Lake Street at the interchange: Hiawatha Avenue and the Blue Line LRT. Lake Street has traffic separating medians, but the medians are not wide enough for pedestrian refuge. Lake Street has a speed limit of 30 miles per hour (mph).

Running above Lake Street, Hiawatha Avenue is a four-lane median-separated 40 mph highway. To get to Lake Street, southbound and northbound traffic exits from Hiawatha Avenue in a single lane, widening into two-left turn lanes and one right turn lane at the intersection with Lake Street. The left- and right-turn lanes are separated by pedestrian refuge islands. The islands reduce the length of the pedestrian crossings along Lake Street and prevent vehicular through movements, including transit vehicles[1]. The right turn lanes from Hiawatha onto Lake are unsignalized free right-turns (not controlled by the traffic signal).

[1] Although no regular service routes perform a through movement, during periods of LRT disruption Metro Transit operates a "bus bridge" of articulated buses to replace Blue Line service; preventing north-south through movements at the interchange therefore impacts bus bridge operations.

There are two bus stops and one Blue Line (LRT) station at the interchange. The westbound bus stop is located approximated 200 feet west of the intersection, connected to a new affordable housing development called Lake Street Station. The eastbound bus stop is located approximately 100 feet west of the intersection, built adjacent to a retaining wall. Both bus stops are farther away from the LRT station than preferred by Metro Transit, and neither bus stop is visible from the LRT station.

Freight train tracks run at-grade on the east side of the intersection. The railroad crossing has overhead signing and flashers that may limit sightlines for approaching westbound traffic. Minnesota Commercial Railway (MNNR) operates approximately 4-6 trains per day through the Lake Street crossing.

For reference, a layout of existing geometric conditions can be found in **Appendix A.**

2.3. Demand

Passenger vehicle, heavy vehicle, pedestrian, and bicycle counts were taken at the 28th Street, Lake Street, and 32nd Street intersections along Hiawatha Avenue in October 2015. The counts were conducted for 24 hours on a weekday and 24 hours on a Saturday. Field visits were also conducted to document existing conditions. Weekend and weekday totals for each mode can be found in **Appendix I**. A summary of peak hour demand for vehicles, pedestrian, and bicycles is provided in **Figures 2-3** through **2-5**.

Pedestrian

Lake Street's heavy traffic volumes and long crossings with no center median refuge presents an uninviting pedestrian environment. Perhaps as a result, only around 120 pedestrians were observed crossing Lake Street at this location in a 24-hour weekday period. By contrast, nearly 2,400 pedestrians crossed east-west within the area over the same weekday time period, traveling to and from the light rail station and various other destinations in the area.

Bicycle

With no specific bicycle facilities within the intersection, many bicycles share the pedestrian infrastructure. Similar to pedestrians, the east-west movement along Lake Street has higher volumes than the north-south movements across Lake Street. Around 275 bicycles were observed crossing Lake Street at this location in a weekday 24-hour period, and over 400 bicycles crossed east-west within the area over the same weekday time period.

Auto

Similar to bicycle and pedestrian movements, the heaviest automobile movement at the Hi-Lake Interchange is east-west along Lake Street. Over 14,000 automobiles were observed travelling westbound and nearly 12,000 automobiles were observed travelling eastbound. The southbound movement from Hiawatha entering Lake Street served nearly 6,000 vehicles. The northbound movement from Hiawatha to Lake Street was the lowest volume with around 2,300 vehicles observed.

	Weekday Daily Total				
Direction	*U Turns*	*Left Turns*	*Straight Through*	*Right Turns*	**Total**
Southbound	0	3,900	0	1,900	**5,800**
Westbound	<10	1,100	9,100	3,800	**14,000**
Northbound	<10	1,000	0	1,300	**2,300**
Eastbound	<50	1,800	8,900	1,000	**11,700**
					33,800

Transit

Three bus routes (Route 21, 27, and 53) and one METRO Line (METRO Blue Line) serve the Hi-Lake Interchange. The eastbound bus stop peaks with over 600 daily alightings and the westbound bus stop peaks with over 800 boardings. There are approximately 120 daily transfers between LRT and the WB Route 21 bus. The Lake Street Blue Line Station is one of the busiest METRO stations outside of a downtown with over 2,600 daily boardings.

		Weekday Boardings (Alightings)		
Mode	*Direction*	*AM Peak*	*PM Peak*	**Daily Total**
Bus	Eastbound	30 (80)	90 (130)	**410 (610)**
	Westbound	50 (60)	210 (100)	**840 (400)**
Blue Line LRT	Northbound/Southbound	170 (*)	380 (*)	**2,660 (*)**

*LRT alightings not available

2.4. Key Issues and Opportunities

The Hi-Lake Interchange is clearly a busy intersection for all modes. The existing design creates a few key issues and opportunities for pedestrians and bicycles in particular.

(1) Lighting

The area below the Hiawatha Bridge has insufficient lighting. The lack of natural light is uncomfortable for pedestrians and diminishes perceived safety and personal security. The contrast in lighting between the area under the bridge and the street makes visibility difficult when entering and exiting the area under the bridge.

Figure 2-6: Shadows and lighting contrast under bridge

(2) Vehicle-Routing, Pedestrian Visibility, and Non-Compliance

Pedestrians frequently cross on the Don't Walk indications when they perceive a gap in traffic. However, the large intersection makes it difficult for pedestrians to see and recognize the approaching left-turn vehicles. The Hiawatha bridge over the interchange compounds the issue by blocking natural light and making the intersection dark.

Figure 2-7: Left-turning vehicles approaching the pedestrian crosswalk

(3) Challenging North-South Pedestrian Crossing

To cross Lake Street, pedestrians have to traverse six lanes of traffic (including turn lanes) without a pedestrian refuge area. Shown below is a pedestrian using the center median as a refuge area. The existing median is approximately four feet wide, which is not wide enough to provide an accessible refuge. A long cycle length at the traffic signal, which can creating long pedestrian delays, is a likely cause of pedestrians deciding to cross the intersection when there are any gaps in traffic.

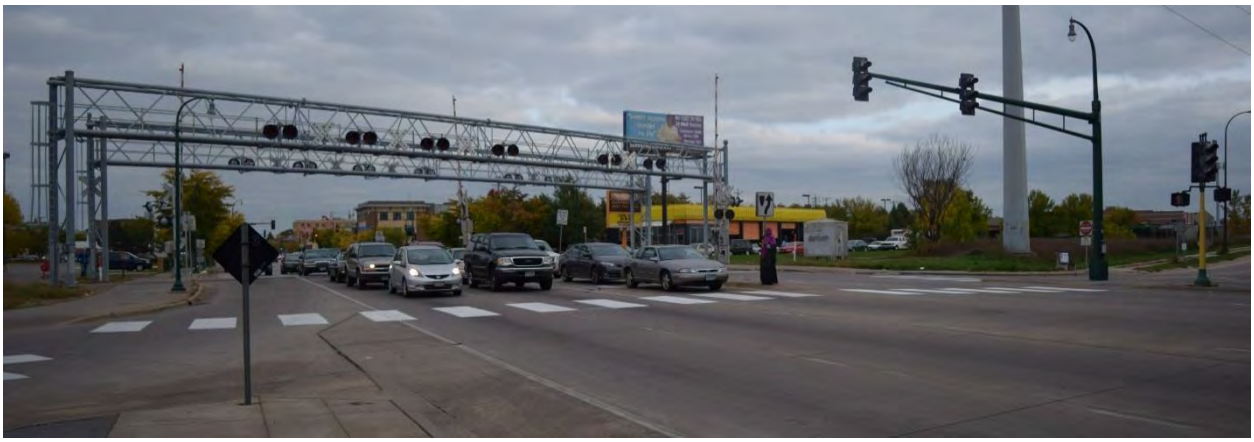


Figure 2-8: North-south crossing on East end of interchange

(4) Driver Confusion within Westbound Right Turn Lane

There is no stop bar for westbound traffic on Lake Street, and the at-grade railroad crossing occurs prior to the traffic signal. This creates inefficient or unsafe queuing: some vehicles do not proceed over the tracks because it is unclear where to stop; others queue on the tracks. In addition, while the pedestrian crossing of this lane is controlled with Walk/Don't Walk indications, the vehicle indications are not very visible and therefore most drivers treat the movement as a "free" right.

Figure 2-9: View of control for westbound right turn lane (Photo Credit: Google Streetview)

(5) Challenging North-South Bicycle Crossing

The intersection is a key midpoint between the Midtown Greenway to the north and the Hiawatha Trail to the south. With no bicycle-specific infrastructure or right-of-way (and with no through-movements allowed for vehicles), bicyclists are forced to use pedestrian paths to cross Lake Street.

Figure 2-10: Bicyclist waiting on the island to cross Lake Street

(6) Confusing Bicycle Routing

For bicyclists approaching Lake Street from the Midtown Greenway along the west side of Hiawatha Avenue, it is unclear how to access Lake Street. Some bikes use the narrow, unmarked, and unsigned shoulder and others use the sidewalk.

Figure 2-11: Southbound approach to Lake Street from bicyclist's perspective

(7) Bus Bridge Operations

Prior to the installation of pedestrian refuge islands, two signs below the Hiawatha bridge would illuminate during Blue Line outages to allow buses to make a through movement. With the pedestrian refuge islands in place, buses cannot make through movements. Instead, southbound bus bridges access the Lake Street Station by traveling on Cedar Avenue to Lake Street. This creates inefficiencies in the bus operations.

Figure 2-12: View of bus bridge message sign

(8) Future Plaza Space

The Corcoran Parklet on the southwest corner of the intersection is the future site of a permanent one-acre plaza that will be home to the Midtown Farmers Market. It offers yard furniture and green space in an otherwise bustling intersection.

Figure 2-13: Corcoran Parklet

(10) New and Future Transit-Oriented Development

The intersection has a new transit-oriented senior and affordable housing development called the Lake Street Station apartments. Proximity to transit, Nice Ride, shopping, and restaurants is an integral part of the building's marketing. Additionally, Hennepin County is redeveloping the former light rail park and ride lot on the southwest quadrant of the interchange, and the development will include a Hennepin County Service Center as well as housing and office space.

Figure 2-14: Lake Street Station Apartments

3.0 EVALUATION MEASURES

3.1. Development

In order to evaluate the potential improvement alternatives against the existing conditions, several evaluation measures were generated. These measures, broken into seven categories (Pedestrian, Bicycle, Vehicles, Transit, Livability & Sustainability, and Costs), attempt to address the issues and opportunities identified in the existing conditions. The criteria are based on existing conditions and are generally measurable (e.g. east-west crossing distance), and the goal of each criteria (e.g. to decrease the east-west crossing distance) was based on the Humanize Hi-Lake petition and the National Association of City Transportation Officials (NACTO) Urban Street Guide. While the goals of the evaluation measures lay the foundation for all improvements, they were primarily used to evaluate the Tier III Alternatives (discussed in **Section 6.0**) in order to objectively compare the large-scale, long-term improvements.

3.2. Base Conditions

The evaluation measures and the base condition per measure is shown in the table below. A full description of each measure including the evaluation methodology is provided in **Appendix C**. Several measures, identified in *italics*, would likely not change with geometric improvements, or the impacts cannot be estimated. For these measures, the existing condition is noted, if available, and the footnote identifies other measures that partially capture the objective of the measure in some form.

Evaluation Measures for Tier III Improvements

No.	Evaluation Measure	Notes	Base Condition
	**Pedestrians**		
P1	East-West Crossing Distance	The distance that a pedestrian on Lake Street is in a crosswalk	200 feet
P2	East-West Signal Delay	The average time a pedestrian waits for a walk signal	56 seconds
P3	East-West Crossing Time	The average time a pedestrian on Lake Street is in a crosswalk	57 seconds
P4	East-West Total Time	The total time needed to travel from eastbound bus stop to the railroad crossing on the north side of Lake Street	199 seconds
P5	East-West Lane Crossings	The number of vehicle lanes a pedestrian on Lake Street crosses	5
P6	Count of Vehicle Free Rights	The number of non-signalized turns allowed	2
P7[1]	*Number and severity of pedestrian crashes*	*2 pedestrian/vehicle crashes since 2010 (4% of total collisions), both at crash severity C (possible injury). Full report available.*	
	**Bicycles**		
B1	Bicycle Crossing Distance	Evaluated using pedestrian crosswalk distance across Lake Street on west side of intersection	140 Feet

Evaluation Measures for Tier III Improvements

No.	Evaluation Measure	Notes	Base Condition
B2	Average Bicycle Delay	Evaluated using average pedestrian signal delay across Lake Street on west side of intersection	91 seconds
B3	Opportunity to connect trails and Blue Line station	Geometry would allow for bicycle connection between the Hiawatha Trail extension and LRT station	No
B4[2]	*Number and severity of bicycle crashes*	*2 bicycle/vehicle crashes since 2010 (4% of total collisions), both at crash severity PDO. Full report available.*	
B5[2]	*Number of people biking to/from transit*	*This data was not available from Metro Transit or the counts conducted for this study*	
	**Vehicles**		
V1	Peak Hour Delay Per Vehicle	Weighted average per vehicle for the entire intersection	35 seconds
V2	Approaches with Spillback	Total number of approaches with spillback during peak hour	1
V3	Queue Length	Maximum 95th percentile queue length	510 feet
V4	Cut-Through Potential	Likelihood that vehicles will use interchange to avoid traffic on Hiawatha	0
V5	Maximum Volume/Capacity Ratio	Maximum value at Lake & Hiawatha during the peak hour; the threshold is less than one	0.64
V6	Volume/Capacity Ratio Sensitivity Test	Increase in traffic volumes required to surpass a volume to capacity ratio of 1 at the intersection	25%
V7.1	Effect on adjacent intersections: 28th St.	Maximum Volume/Capacity ratio at 28th Street	0.95
V7.2	Effect on adjacent intersections: 32nd St.	Maximum Volume/Capacity ratio at 32nd Street	0.90
V8[3]	*Prevalence of speeding*	*Lake Street (West of intersection): 85 percent of vehicles travel at or below 29-30 MPH in 2010; no data available for ramps*	
V9[3]	*Number and severity of automobile crashes*	*50 auto/auto crashes since 2010 (92% of total collisions) with the majority being rear-ends. Full report available.*	
	**Transit**		
T1	Bus Movements Allowed	The number of ramps used during "bus bridge" operations	2 (South ramps only)
T2	Incorporates arterial BRT Station Footprint	Whether or not geometry could include a full arterial BRT station	No
T3	Distance between bus stop and LRT Station	Distance between LRT station and bus stop sign (120 feet minimum assumed for arterial BRT)	WB: 140 ft. EB: 50 ft.
T4	Delay due to merging back into traffic	Number of times the bus experiences delay from merging back into the travel lane after boarding passengers	Multiple

Evaluation Measures for Tier III Improvements

No.	Evaluation Measure	Notes	Base Condition
	Livability and Sustainability		
L1	Diverted Vehicles	Number of vehicles from Hiawatha that use other routes to access Lake Street per day	0
L2	Pavement Removal/Opportunity Space	Area re-allocated from transportation to other uses	0
L3	Livability Aesthetics	Geometry could decrease areas of shadow, include additional street lights, or incorporate public art	Minimal
L4	Opportunity for Shade & Trees	Geometry could include new medians with planters, street trees, and/or boulevards	Minimal
L5	Wayfinding (Decrease Pedestrian Confusion)	Geometry is simple and pedestrian space is obvious	None
L6[4]	*Presence of garbage/debris*	*Common*	
L7[4]	*Crime rates*	*Over the past year, 7 incidents of robbery, 1 motor vehicle theft, 1 homicide, and 1 aggravated assault was reported to Minneapolis Police Department near the intersection*	
L8[4]	*Surveillance/camera coverage*	*Unknown*	
Costs			
C1	Capital Costs	Estimated capital costs (2015 dollars)	$0

[1] Not carried forward as an evaluation measure. Captured by P1, P5, and P6.

[2] Not carried forward as an evaluation measure. Captured by B1, B2, and B3.

[3] Not carried forward as an evaluation measure. Captured by P6, V2, V3, and V5.

[4] Not carried forward as an evaluation measure. Captured by L3

Hi-Lake Phase 2 Final Report

Chapter Two: Community Engagement

The City of Minneapolis and Hennepin County have worked directly with many stakeholders on the Hi-Lake Study. Engagement in Phase 2 focused on seeking feedback on the draft Action Plan and sharing project updates. From summer 2017 through fall 2018, staff hosted and attended a series of engagement activities to gather feedback on Phase 2 of the Hi-Lake study.

- **Open Streets:** City and County staff hosted a booth sharing information about the Hi-Lake Study at the 2017 and 2018 Open Streets events on Lake Street and Minnehaha Avenue.
- **Stakeholder Working Group:** City and County staff engaged a group of community stakeholders on the Phase 2 scope of work and project updates. The stakeholder working group met twice during Phase 2 and was comprised of staff following organizations:
    - Corcoran Neighborhood Organization
    - Longfellow Community Council
    - Lake Street Council
    - East Phillips Improvement Coalition
    - Wellington Management, Inc.
    - YWMCA
    - Our Streets Minneapolis
    - The Sierra Club North Star Chapter
    - Our Streets Minneapolis
    - Minneapolis Ward 9 Council Office
- **Presentations at meetings:** City and County staff engaged residents and staff about the Hi-Lake Study at the following public meetings where community members could voice their concerns and solutions for Hi-Lake.
    - May 30, 2017: Corcoran Neighborhood Association meeting
    - July 6, 2017: Corcoran Neighborhood Association meeting
    - January 18, 2017: Longfellow Community Council meeting
    - February 27, 2017: Community meeting hosted by Longfellow Community Council
    - November 13, 2018: Community meeting hosted by Longfellow Community Council

FEEDBACK

Feedback from these engagement activities uncovered many key themes:

- Pedestrian comfort and personal safety are a major concern
- A desire to improve bicyclist access and wayfinding through Hi-Lake
- A growing desire to see improvements at Hi-Lake in the near-term
- A desire to study how street design could improve personal safety issues at Hi-Lake
- Overall support for action plan and long-term Tight Diamond design
- Desire to continue to pursue opportunities to fund the Tight Diamond
- A desire to explore ways to activate the Hiawatha Avenue Bridge underpass space with improved lightening or the installation of public art or even allowing commercial activities.

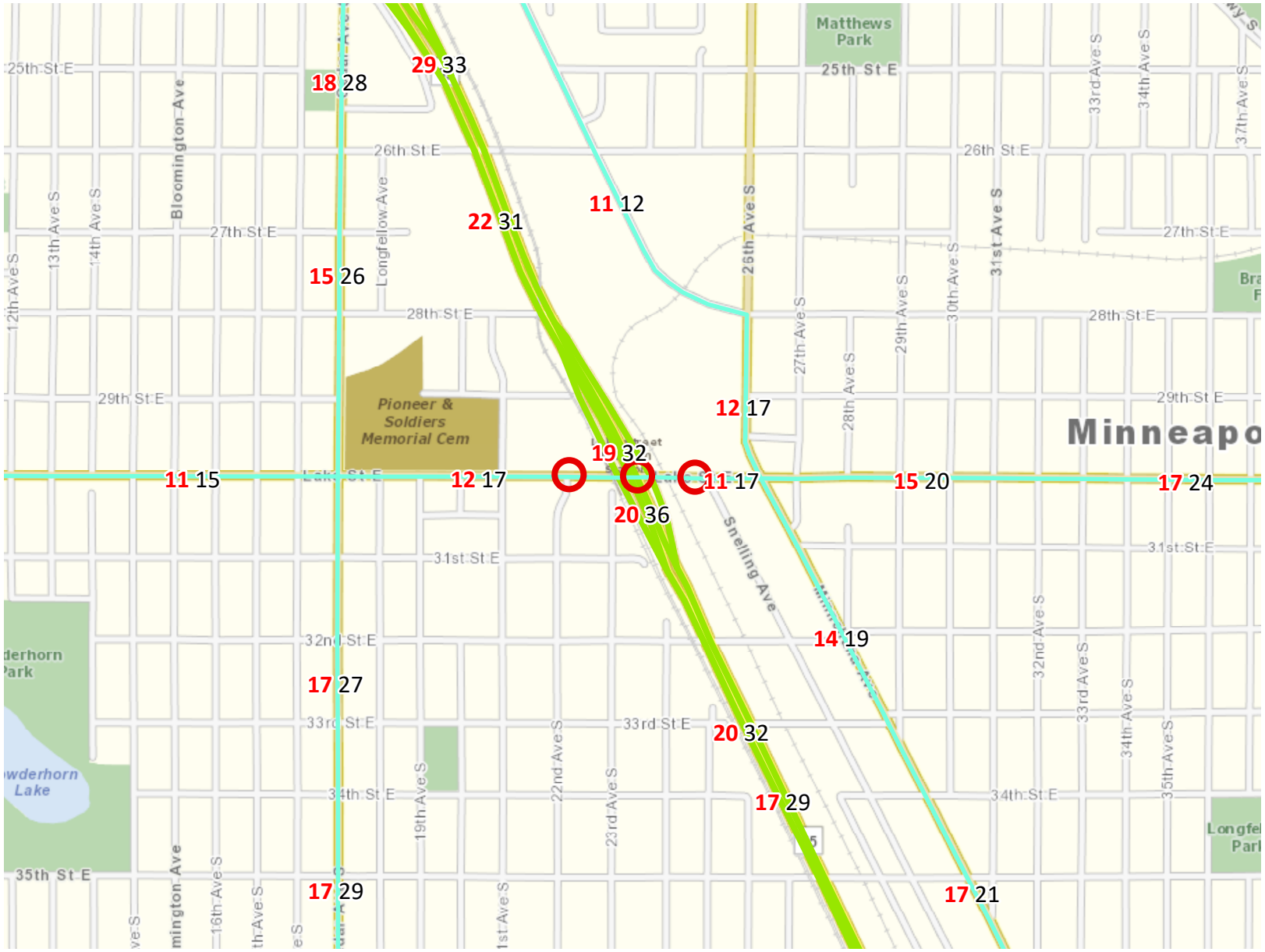
Table 1 Potential Hi-Lake Improvements

	IMPROVEMENT		IMPLEMENTATION		BENEFITS					OTHER CONSIDERATIONS			
		Details	Estimated Costs (2018)	Lead Time	Reduces Vehicle Speeds	Reduces Pedestrian Exposure to Vehicles	Increases Pedestrian Visibility to Vehicles	Improves Pedestrian Realm/ Urban Form	Total Benefits	Consistency with Tight Diamond		Coordination Effort/ Implementation Challenges	
Space Allocation or Geometry Improvements		**PERMANENT CURB EXTENSION** Permanent reconfiguration of sweeping vehicle movements to pedestrian space using concrete at free right-hand turns	Medium $20k	1-2 years	✓	✓✓	✓	✓		No	Would likely need to be reconstructed in full build-out	Most	May have impact on snow plows, emergency response vehicles, drainage, and the disability community
		REMOVE RIGHT TURN LANES Permanently covert vehicle space to pedestrian space. Could occur at westbound transit boarding area and/or near southbound Hiawatha entrance	High $150k	2+ years	✓✓	✓	✓	✓		No	Would likely be reconfigured in full build-out	Some	Traffic impacts should be evaluated and justify pedestrian benefits
		TEMPORARY WESTBOUND BUS PLATFORM Procured plastic or other heavy materials to temporarily improve westbound Metro Transit bus boarding area into existing right turn lane	Medium $40k	1 year or less	✓	✓	✓	✓		No	Would be utilized elsewhere upon full build-out	Little	Need to coordinate with Metro Transit to procure proper products
		TEMPORARY CURB EXTENSION Temporary transformation of sweeping vehicle movements to pedestrian space using bollards or paint at free right-hand turns	Low $5k	1 year or less	✓	✓	✓	✓		No	Although it would be removed in full build-out, improvement has low fiscal impact with high benefit	Some	May have impact on snow plows and emergency response vehicles
		SPEED TABLES Raised pedestrian crossings at free right-hand turns	Medium $25k	1-2 years	✓✓	✗	✓	✗		No	Would certainly be removed in full build-out	Most	May have impact on snow plows, emergency response vehicles, drainage, and the disability community
		SIDEWALK BUFFER SPACE Temporarily covert vehicle space to pedestrian space using bollards, paint, and planters	Low $15k	1 year or less	✓	✓	✓	✓		No	Would certainly be reconfigured in full build-out	Some	Safety concerns will need to be addressed if solution is not permanent
Other Engineering Improvements		**PEDESTRIAN MEDIAN REFUGE ISLAND** Concrete or bollard-created refuge island on Lake Street crossings to improve pedestrian crossings	Low $12.5k	1-2 years	✗	✓	✓	✓		No	Would likely need to be reconstructed in full build-out	Little	Additional engineering should ensure truck and bus movements are not impacted
		HIGH VISIBILITY CROSSWALKS Visible markings designate a safe crossing location and alert drivers to pedestrians	Medium $40K	1 year or less	✗	✗	✓	✓		No	Would likely be reconfigured in full build-out	Little	Requires periodic maintenance
		ACCESSIBLE PEDESTRIAN PUSH BUTTONS Audible notifications to pedestrians that corresponds to visually available signal information, such as countdown timers	High $90k	1-2 years	✗	✓	✓	✗		No	Would likely need to be reconstructed in full build-out	Little	Most effective when paired with other crossing improvements
		LEADING PEDESTRIAN INTERVAL Gives pedestrians priority in an intersection with a few seconds head start before vehicles	Low $5k	1 year or less	✗	✗	✓	✗		Yes	Familiarity with LPI would carry through to full build-out	Little	Traffic impacts should be evaluated and justify pedestrian benefits
		NEW PEDESTRIAN RAMPS New detectable warning surfaces and reconfigured slopes at pedestrian ramps	High $110k	1-2 years	✗	✓	✗	✗		No	Would likely need to be reconstructed in full build-out	Little	Requires periodic replacement
Public Space Improvements		**LANDSCAPING** Landscaping or street trees, potentially in planters to be semi-mobile	Medium $27.5k	2+ years	✓	✗	✓	✓		Possibly	Depending on plantar and street choice these could be maintained in full build-out	Most	Special assessment for installation and regular maintenance may be required
		RECONSIDER AUTO ACCESS POINTS TO RETAIL Evaluate vehicle access to southwest corner of the Target site to reduce heavy vehicle traffic before railroad tracks	Low Staff time	2+ years	✗	✓	✗	✓		Yes	Benefits of reducing conflict points would carry forward to full build-out	Most	Private business will need alternative access routes
		LIGHTING Enhanced lighting under the Hiawatha bridge	High $175k	1-2 years	✗	✗	✓	✓		Yes	Benefits in public realm would carry forward to full build-out	Most	Increased fixture replacements and power costs
		PUBLIC ART Public art under the Hiawatha bridge	Medium $30k	2+ years	✗	✗	✗	✓		Yes	Benefits in public realm would carry forward to full build-out	Most	Additional time is needed to incorporate local art creation and public input

Attachment 10 - Lake St level of congestion

Level of Congestion

Roadway Spot Mobility & Safety Project: Hi/Lake Interchange Safety Improvements | Map ID: 1587396362792



Project Points
A Minor Arterials
A Minor Arterials Planned
Principal Arterials
Principal Arterials Planned

0 0.125 0.25 0.5 0.75 1 Miles

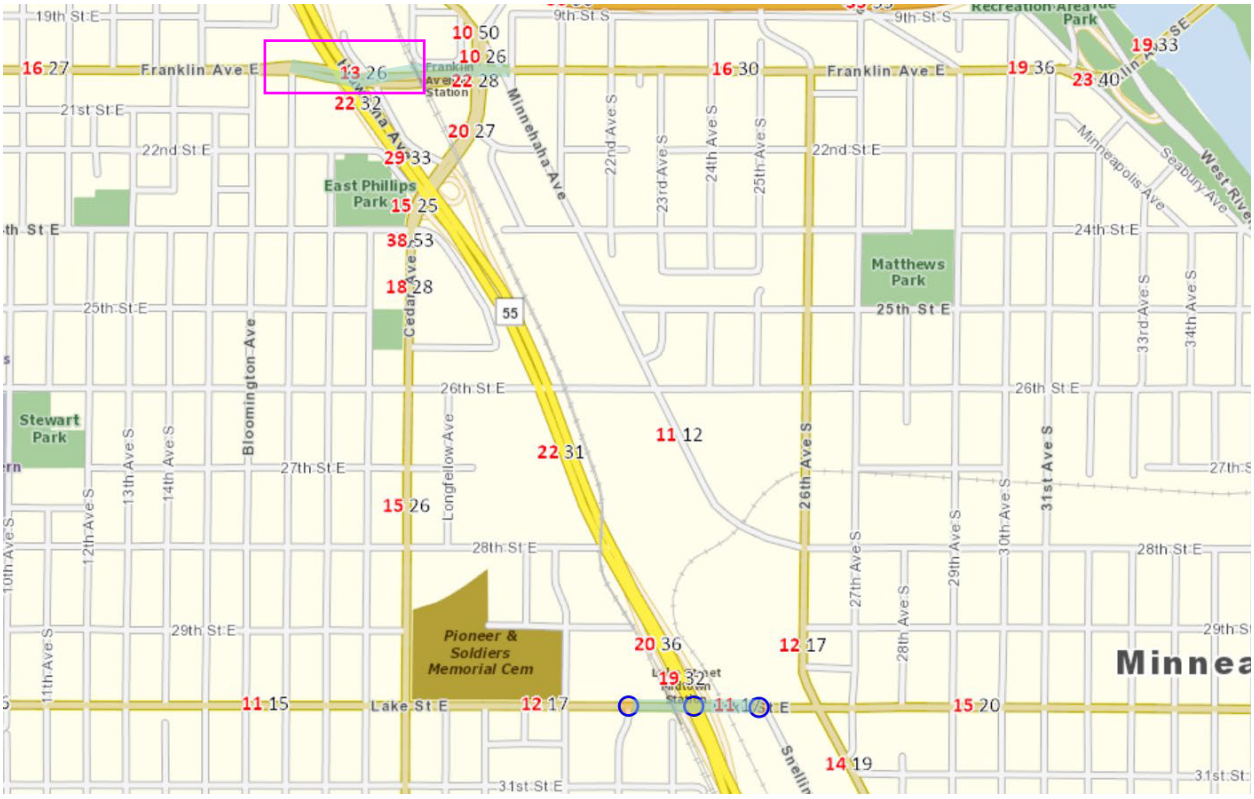
Created: 4/20/2020
LandscapeRSA1

For complete disclaimer of accuracy, please visit https://giswebsite.metc.state.mn.us/gissite/notice.aspx

METROPOLITAN COUNCIL

Attachment 11 - Franklin Ave level of congestion map

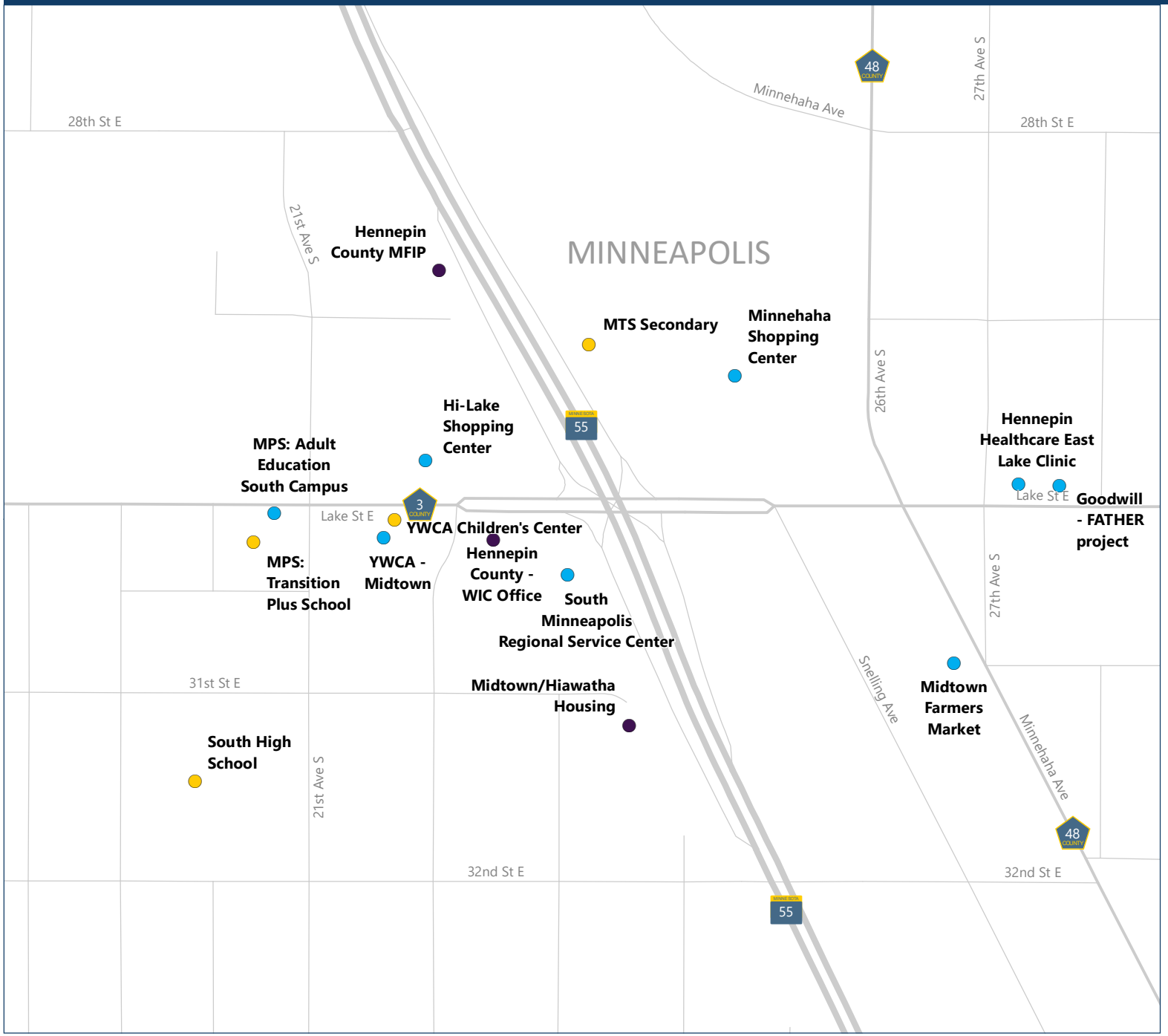
Revised level of congestion map showing parallel roadway (Franklin Ave E)



Hi-Lake interchange Safety Improvements

Attachment 12 | Socioeconomic equity map

HENNEPIN COUNTY
MINNESOTA



Key

Socio-Economic Equity Category

- Community Resource
- Disability
- Elderly
- Low-Income
- Youth

0 0.075 0.15 Miles

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.

Published date: 5/4/2020

N

Attachment 13 - Socio-economic map

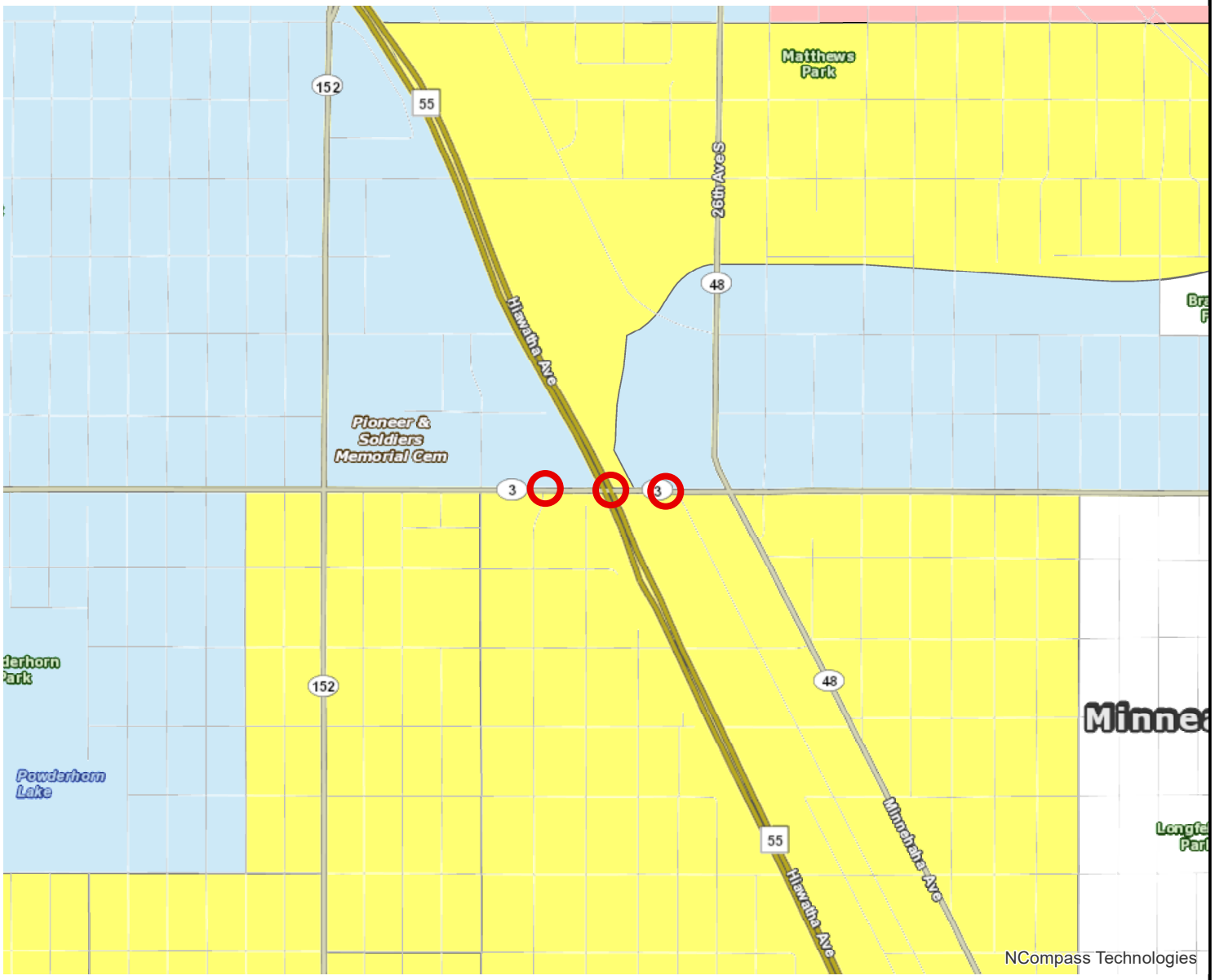
Socio-Economic Conditions

Roadway Spot Mobility & Safety Project: Hi/Lake Interchange Safety Improvements | Map ID: 1587396362792

Results

Project located **IN**
Area of Concentrated Poverty with 50% or more of residents are people of color (ACP50):
(0 to 30 Points)

Tracts within half-mile:
8500 107400 107500
108600 108700 108800
125900



Points

Area of Concentrated Poverty > 50% residents of color

Area of Concentrated Poverty

Above reg'l avg conc of race/poverty

0 0.15 0.3 0.6 0.9 1.2 Miles

Created: 4/20/2020
LandscapeRSA2

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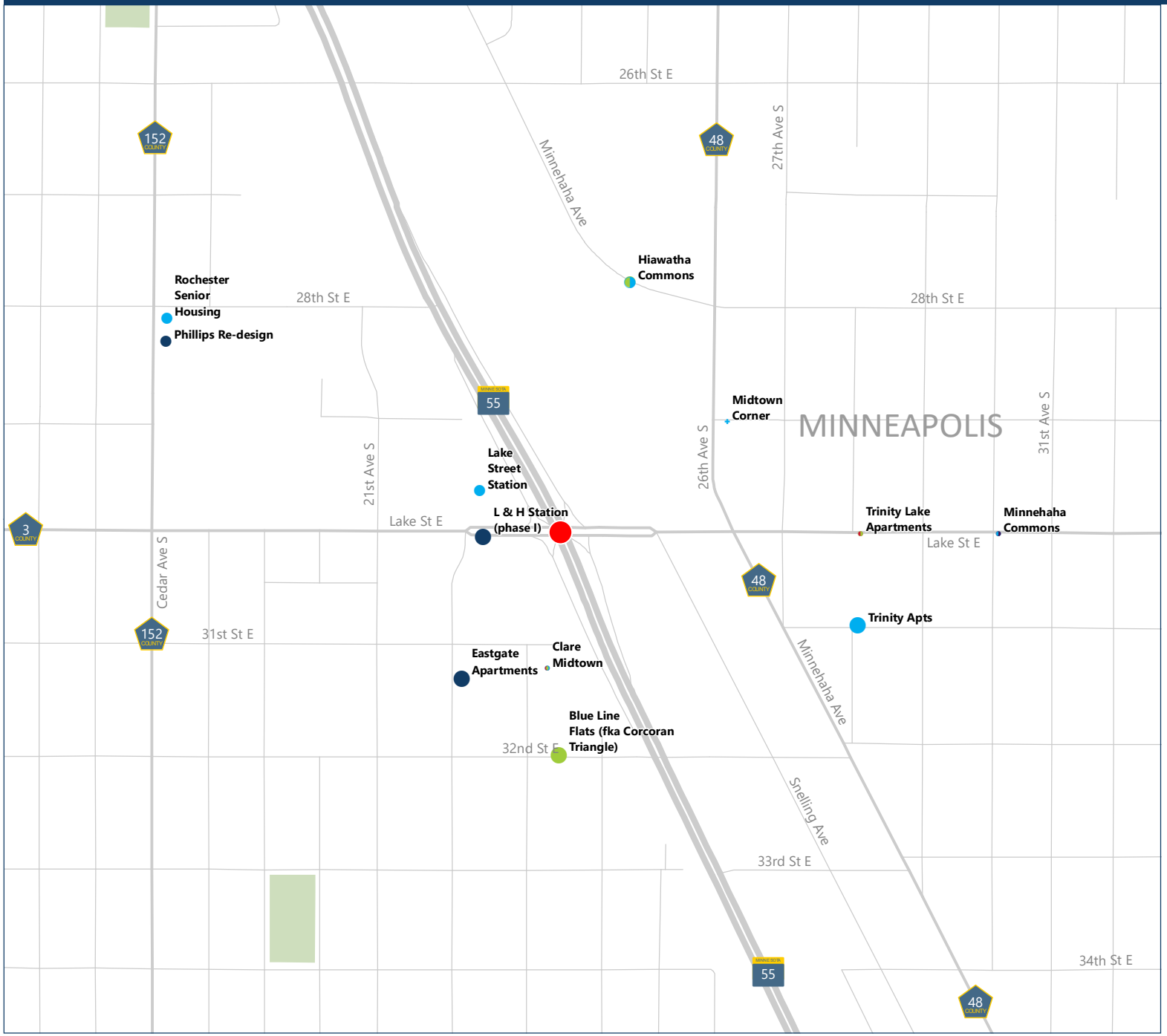
METROPOLITAN COUNCIL

CSAH 3 (Lake Street) Spot Mobility & Safety Project

Attachment 14 | Affordable Housing Access Map

HENNEPIN COUNTY
MINNESOTA



Key

- Project Location

Groups Served

- People with Disabilities
- Elderly
- Family
- Homeless
- Single People
- Multiple Groups
- No Information

Affordable Units

- 0 - 50
- 51 - 100
- 101 - 150
- 151 - 200
- 201 - 1500

Construction Status

- Complete
- Planned

0 0.125 0.25 Miles

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Published date: 4/29/2020

N

Hennepin

Attachment 15. MOE report

Existing Conditions (AM Peak) 04/22/2020

124: Hiawatha Av S SB Ramp & Hiawatha Av S NB Ramp & Lake St E

Direction	All
Future Volume (vph)	3305
Total Delay / Veh (s/v)	41
CO Emissions (kg)	4.22
NOx Emissions (kg)	0.82
VOC Emissions (kg)	0.98

Proposed Conditions (AM Peak) 04/22/2020

3: Hiawatha Ave S SB Ramp & Lake St E

Direction	All
Future Volume (vph)	3031
Total Delay / Veh (s/v)	25
CO Emissions (kg)	3.17
NOx Emissions (kg)	0.62
VOC Emissions (kg)	0.73

124: Hiawatha Av S NB Ramp & Lake St E

Direction	All
Future Volume (vph)	2990
Total Delay / Veh (s/v)	7
CO Emissions (kg)	1.31
NOx Emissions (kg)	0.25
VOC Emissions (kg)	0.30

Notes from the Applicant:

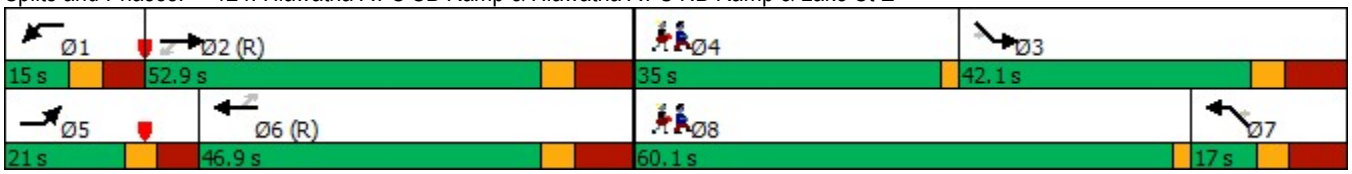
1) Staff was unable to collect turning movement counts within the last 3 years given the current abnormal travel patterns caused by COVID-19. Therefore, staff used turning movement counts collected in 2015, as part of the Hi-Lake Interchange Study, and applied an annual growth rate of 0.5% as recommended in the study.

2) The traffic volumes in the Existing Conditions and the Proposed Conditions are slightly different due to the conversion of the SPUI Design to a Tight Diamond Design. Therefore, staff added the delay and emissions experienced at both intersections in the proposed conditions and compared it to existing conditions experienced at the SPUI.

Lane Group	EBL	EBT	EBR2	WBL	WBT	WBR2	SEL	SER2	NWL	NWR2	Ø4	Ø8
Lane Configurations												
Traffic Volume (vph)	145	920	75	60	835	235	685	240	70	40		
Future Volume (vph)	145	920	75	60	835	235	685	240	70	40		
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	Perm	Prot	Perm		
Protected Phases	5	2		1	6		3		7		4	8
Permitted Phases			2			6		3		7		
Detector Phase	5	2	2	1	6	6	3	3	7	7		
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	5.0	5.0	5.0	7.0	7.0
Minimum Split (s)	15.0	27.0	27.0	15.0	27.0	27.0	15.5	15.5	15.0	15.0	35.0	35.0
Total Split (s)	21.0	52.9	52.9	15.0	46.9	46.9	42.1	42.1	17.0	17.0	35.0	60.1
Total Split (%)	14.5%	36.5%	36.5%	10.3%	32.3%	32.3%	29.0%	29.0%	11.7%	11.7%	24%	41%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.0	2.0
All-Red Time (s)	4.5	6.5	6.5	4.5	6.5	6.5	7.0	7.0	6.5	6.5	0.0	0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	8.0	10.0	10.0	8.0	10.0	10.0	10.5	10.5	10.0	10.0		
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	23.2	60.5	60.5	12.6	49.9	49.9	43.3	43.3	37.0	37.0		
Actuated g/C Ratio	0.16	0.42	0.42	0.09	0.34	0.34	0.30	0.30	0.26	0.26		
v/c Ratio	0.58	0.72	0.15	0.44	0.75	0.57	0.74	0.41	0.09	0.09		
Control Delay	64.8	39.3	0.6	71.4	47.4	22.0	50.8	12.9	37.4	0.3		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	64.8	39.3	0.6	71.4	47.4	22.0	50.8	12.9	37.4	0.3		
LOS	E	D	A	E	D	C	D	B	D	A		
Approach Delay		40.0			43.4							
Approach LOS		D			D							

Intersection Summary	
Cycle Length: 145	
Actuated Cycle Length: 145	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of 1st Green	
Natural Cycle: 145	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 40.9	Intersection LOS: D
Intersection Capacity Utilization 74.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 124: Hiawatha Av S SB Ramp & Hiawatha Av S NB Ramp & Lake St E



Lane Group	EBT	WBL	WBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	1065	60	905	685	0
Future Volume (vph)	1065	60	905	685	0
Turn Type	NA	pm+pt	NA	Prot	NA
Protected Phases	6	5	2	8	
Permitted Phases		2			8
Detector Phase	6	5	2	8	8
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	23.5	23.5	23.5	39.5	39.5
Total Split (s)	27.0	23.5	50.5	39.5	39.5
Total Split (%)	30.0%	26.1%	56.1%	43.9%	43.9%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	6.5	6.5
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	C-Max	None	C-Max	None	None
Act Effct Green (s)	35.8	46.3	46.3	31.7	31.7
Actuated g/C Ratio	0.40	0.51	0.51	0.35	0.35
v/c Ratio	0.64	0.29	0.54	0.89	0.80
Control Delay	24.9	18.5	10.5	47.0	31.7
Queue Delay	0.0	0.0	0.2	0.0	0.0
Total Delay	24.9	18.5	10.7	47.0	31.7
LOS	C	B	B	D	C
Approach Delay	24.9		11.2		39.6
Approach LOS	C		B		D

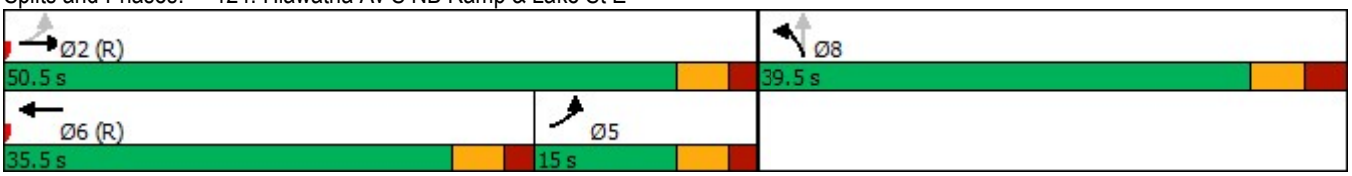
Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 66 (73%), Referenced to phase 2:WBTL and 6:EBT, Start of 1st Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 25.1	Intersection LOS: C
Intersection Capacity Utilization 91.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 3: Hiawatha Ave S SB Ramp & Lake St E

Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Traffic Volume (vph)	145	1605	895	0
Future Volume (vph)	145	1605	895	0
Turn Type	pm+pt	NA	NA	NA
Protected Phases	5	2	6	
Permitted Phases	2			8
Detector Phase	5	2	6	8
Switch Phase				
Minimum Initial (s)	5.0	10.0	10.0	7.0
Minimum Split (s)	15.0	32.5	32.5	39.5
Total Split (s)	15.0	50.5	35.5	39.5
Total Split (%)	16.7%	56.1%	39.4%	43.9%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	2.0	2.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	6.5
Lead/Lag	Lag		Lead	
Lead-Lag Optimize?	Yes		Yes	
Recall Mode	None	C-Max	C-Max	None
Act Effct Green (s)	69.7	69.7	54.7	8.3
Actuated g/C Ratio	0.77	0.77	0.61	0.09
v/c Ratio	0.38	0.65	0.43	0.49
Control Delay	6.0	4.2	9.4	19.0
Queue Delay	3.4	0.9	0.0	0.0
Total Delay	9.4	5.1	9.4	19.0
LOS	A	A	A	B
Approach Delay		5.4	9.4	19.0
Approach LOS		A	A	B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 8 (9%), Referenced to phase 2:EBTL and 6:WBT, Start of 1st Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 7.4	Intersection LOS: A
Intersection Capacity Utilization 91.3%	ICU Level of Service F
Analysis Period (min) 15	

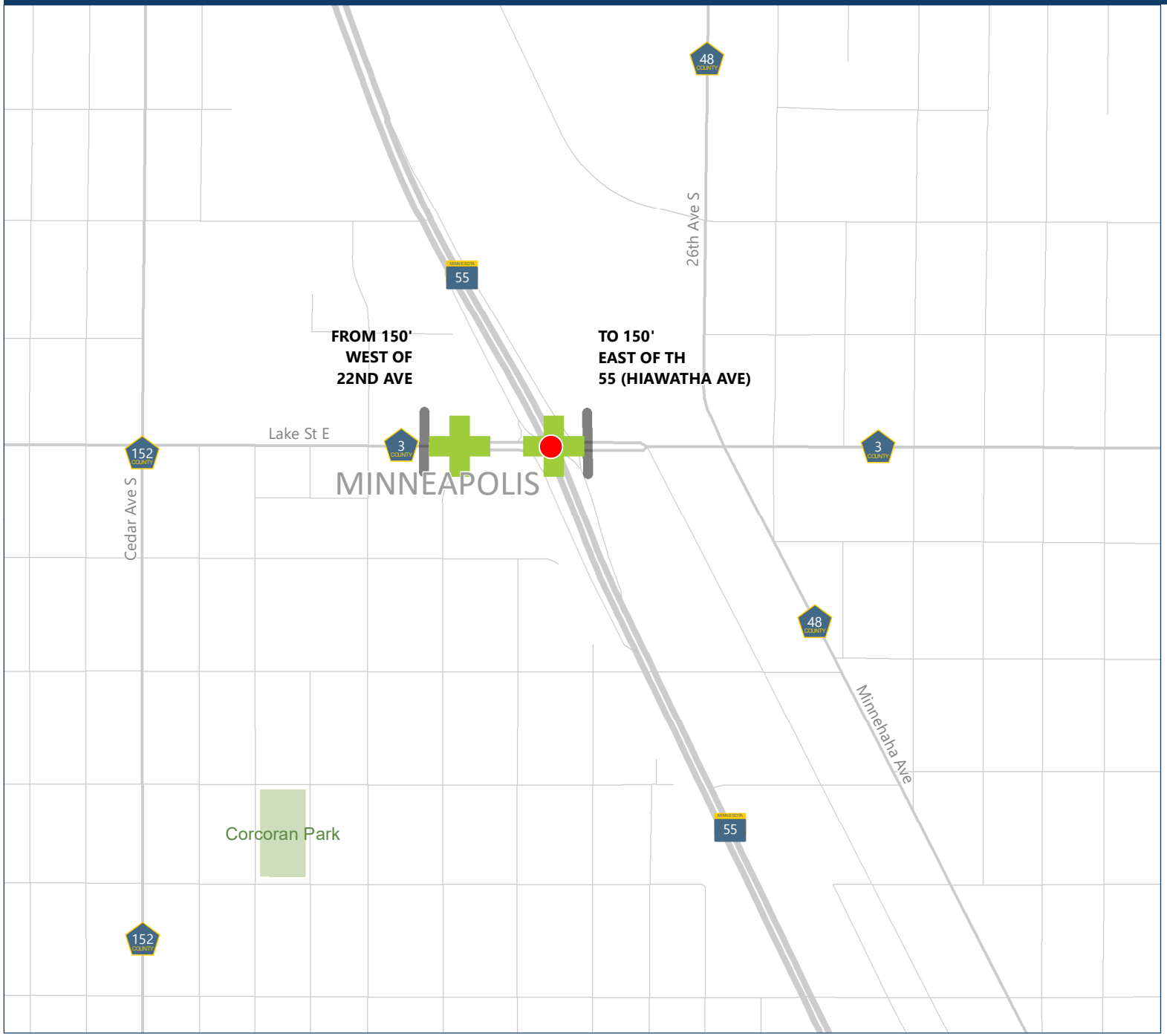
Splits and Phases: 124: Hiawatha Av S NB Ramp & Lake St E



CSAH 3 (Lake St) Spot Mobility and Safety Project

Attachment 16 | Crash Map and Detail Listing

HENNEPIN COUNTY
MINNESOTA



Key

- Project Location
- Major Intersection

0 0.125 0.25 Miles

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.

Published date: 4/9/2020

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Hennepin

CSAH 3 (Lake St) Spot Mobility and Safety Project

Attachment 19 | Crash Map and Detail Listing

Intersection A | At 22nd Ave

Incident ID	Roadway	Month	Day	Year	Hour	Sev	Num of Ks	Num of Veh	Basic Type	Contributing Factor	Latitude	Longitude
00317788	22ND AVE S	1	8	2016	3	5	0	2	7	4	44.948219	-93.2403179
00326334	E LAKE ST	2	4	2016	1	5	0	2	90	2	44.9485155	-93.240072
00331438	E LAKE ST	2	23	2016	9	5	0	2	90	65	44.9485259	-93.2404265
00337159	E LAKE ST	3	21	2016	7	5	0	2	7	70	44.9483823	-93.2399229
00351352	22ND AVE S	5	24	2016	3	5	0	2	10	2	44.948416	-93.2403374
00352270	E LAKE ST	5	27	2016	5	5	0	1	4	99	44.9484421	-93.2403491
00355423	E LAKE ST	6	9	2016	3	0	0	0	90		44.9485177	-93.2395377
00364596	E LAKE ST	7	18	2016	8	5	0	2	7		44.9483484	-93.2395974
00375166	E LAKE ST	7	2	2016	6	5	0	2	10	1	44.9485059	-93.2406143
00376227	E LAKE ST	9	2	2016	6	5	0	0	90		44.9485368	-93.2404099
00383354	E LAKE ST	10	1	2016	11	0	0	0	90		44.9484342	-93.2394985
00392874	E LAKE ST	11	7	2016	6	5	0	2	90	74	44.9482897	-93.2403317
00397731	E LAKE ST	11	20	2016	2	5	0	1	3	68	44.9482683	-93.2401728
00399616	E LAKE ST	12	2	2016	10	0	0	0	90		44.948423	-93.2398354
00426988	22ND AVE S	3	4	2017	9	3	0	2	10	99	44.9483358	-93.2403118
00447417	E LAKE ST	4	24	2017	9	4	0	3	7	1	44.9484348	-93.2402199
00448455	22ND AVE S	4	28	2017	1	5	0	2	5	1	44.9482933	-93.2403296
00450922	E LAKE ST	5	9	2017	6	0	0	0	90		44.9484711	-93.2401748
00456214	E LAKE ST	5	31	2017	12	5	0	0	90	70	44.9483012	-93.2405196
00456702	E LAKE ST	6	2	2017	4	5	0	1	4		44.9484424	-93.2403362
00497300	E LAKE ST	8	28	2017	2	5	0	2	5	70	44.9482826	-93.2402523
00501296	22ND AVE S	9	14	2017	6	5	0	2	90	99	44.9482445	-93.2403583
00515695	22ND AVE S	11	9	2017	3	5	0	1	4	99	44.9482707	-93.2403081
00532646	E LAKE ST	12	31	2017	22	5	0	1	4	99	44.9484137	-93.2405387
00540379	22ND AVE S	1	26	2018	7	4	0	1	1	99	44.9481409	-93.2403009
00582557	E LAKE ST	3	9	2018	4	5	0	0	90	99	44.9484864	-93.2396885
00585633	E LAKE ST	3	26	2018	2	5	0	2	5	1	44.9484159	-93.2403825
00586235	E LAKE ST	3	29	2018	11	5	0	1	4	99	44.9482856	-93.2398152
00586541	E LAKE ST	3	30	2018	8	5	0	0	1		44.948435	-93.2403289
00589456	22ND AVE S	4	8	2018	9	5	0	1	4		44.9483056	-93.2403385
00597234	-- NOT ON ROADW	5	14	2018	8	5	0	0	90		44.9485478	-93.2396449
00626915	E LAKE ST	8	10	2018	8	4	0	1	2	99	44.9482956	-93.2403653
00630468	E LAKE ST	8	26	2018	9	4	0	3	9	2	44.9483052	-93.2403351
00635292	E LAKE ST	9	16	2018	6	0	0	0	90		44.9484509	-93.2401613
00650656	E LAKE ST	10	9	2018	12	5	0	1	3	68	44.9484902	-93.2395779
00650973	22ND AVE S	10	10	2018	4	4	0	3	9	1	44.9483345	-93.2403621
00656336	E LAKE ST	11	2	2018	11	0	0	0	90		44.94839	-93.2398146
00659837	E LAKE ST	11	13	2018	3	4	0	1	1	1	44.9484788	-93.2404465
00663179	22ND AVE S	11	27	2018	4	5	0	2	8	1	44.9483607	-93.2403756
00345661	E LAKE ST	4	30	2016	0	2	0	1	3	70	44.9482266	-93.2409251
	Subtotal	**23**										

CSAH 3 (Lake St) Spot Mobility and Safety Project

Attachment 19 | Crash Map and Detail Listing

Intersection B | At TH 55 (Hiawatha Ave)

Incident ID	Roadway	Month	Day	Year	Hour	Sev	Num of Ks	Num of Vehs	Basic Type	Contributing Factor	Latitude	Longitude
00322555	RAMP641	1	22	2016	3	4	0	3	7	74	44.9484528	-93.2378503
00331719	RAMP504	2	25	2016	11	4	0	1	1	90	44.9485653	-93.2388973
00338246	E LAKE ST	3	25	2016	8	4	0	1	4		44.9484189	-93.2389571
00348318	E LAKE ST	5	11	2016	11	0	0	0	90		44.9482187	-93.2391011
00349370	HIAWATHA AVE	5	16	2016	8	5	0	2	7	1	44.9483922	-93.2380179
00349405	RAMP648	5	16	2016	11	4	0	1	2	1	44.9482324	-93.2387014
00359785	E LAKE ST	6	27	2016	5	5	0	2	7	1	44.948436	-93.2375854
00387084	RAMP641	10	17	2016	1	5	0	1	3	71	44.9485045	-93.2378724
00404915	E LAKE ST	12	16	2016	2	5	0	2	7	70	44.9483572	-93.2382644
00449961	E LAKE ST	5	5	2017	5	5	0	2	7	1	44.9482716	-93.2399828
00453760	E LAKE ST	5	20	2017	10	5	0	1	4	1	44.9484603	-93.239092
00470555	RAMP891	6	17	2017	8	4	0	1	1	1	44.9482655	-93.2376719
00473795	E LAKE ST	6	30	2017	11	5	0	1	4		44.9484534	-93.2377297
00492558	E LAKE ST	8	8	2017	4	5	0	1	3	90	44.948196	-93.2393754
00506759	E LAKE ST	10	6	2017	8	5	0	0	1		44.9482894	-93.2384611
00509355	E LAKE ST	10	17	2017	9	5	0	2	5	69	44.9484446	-93.2384636
00510795	E LAKE ST	10	18	2017	11	5	0	2	7	1	44.9482832	-93.2389196
00515204	HIAWATHA AVE	11	6	2017	6	5	0	1	1	1	44.9484216	-93.2385429
00534652	E LAKE ST	1	11	2018	12	5	0	1	4		44.9484282	-93.2388581
00541644	E LAKE ST	1	31	2018	9	5	0	2	7		44.9482901	-93.2386996
00589277	E LAKE ST	4	7	2018	9	5	0	1	4		44.9482794	-93.2385938
00596706	RAMP504	5	11	2018	12	5	0	1	4		44.9484428	-93.2388767
00609830	E LAKE ST	7	10	2018	10	5	0	2	7	1	44.9482894	-93.2387721
00665641	E LAKE ST	12	4	2018	4	5	0	1	4		44.9482412	-93.2390368
00629219	RAMP648	8	21	2018	12	3	0	1	2	99	44.94828	-93.2387603
00397453	HIAWATHA AVE	11	16	2016	11	5	0	2	5	10	44.9487095	-93.2381667
00326347	E LAKE ST	2	4	2016	15	5	0	1	4	1	44.9484397	-93.2371426
00354524	E LAKE ST	6	6	2016	15	4	0	2	7	2	44.9483497	-93.2372932
00347816	RAMP648	5	9	2016	13	4	0	1	3	68	44.948004	-93.2385797
00606512	RAMP641	6	24	2018	15	5	0	3	7	1	44.9486518	-93.2380074

Subtotal: 28

Project Total: 51

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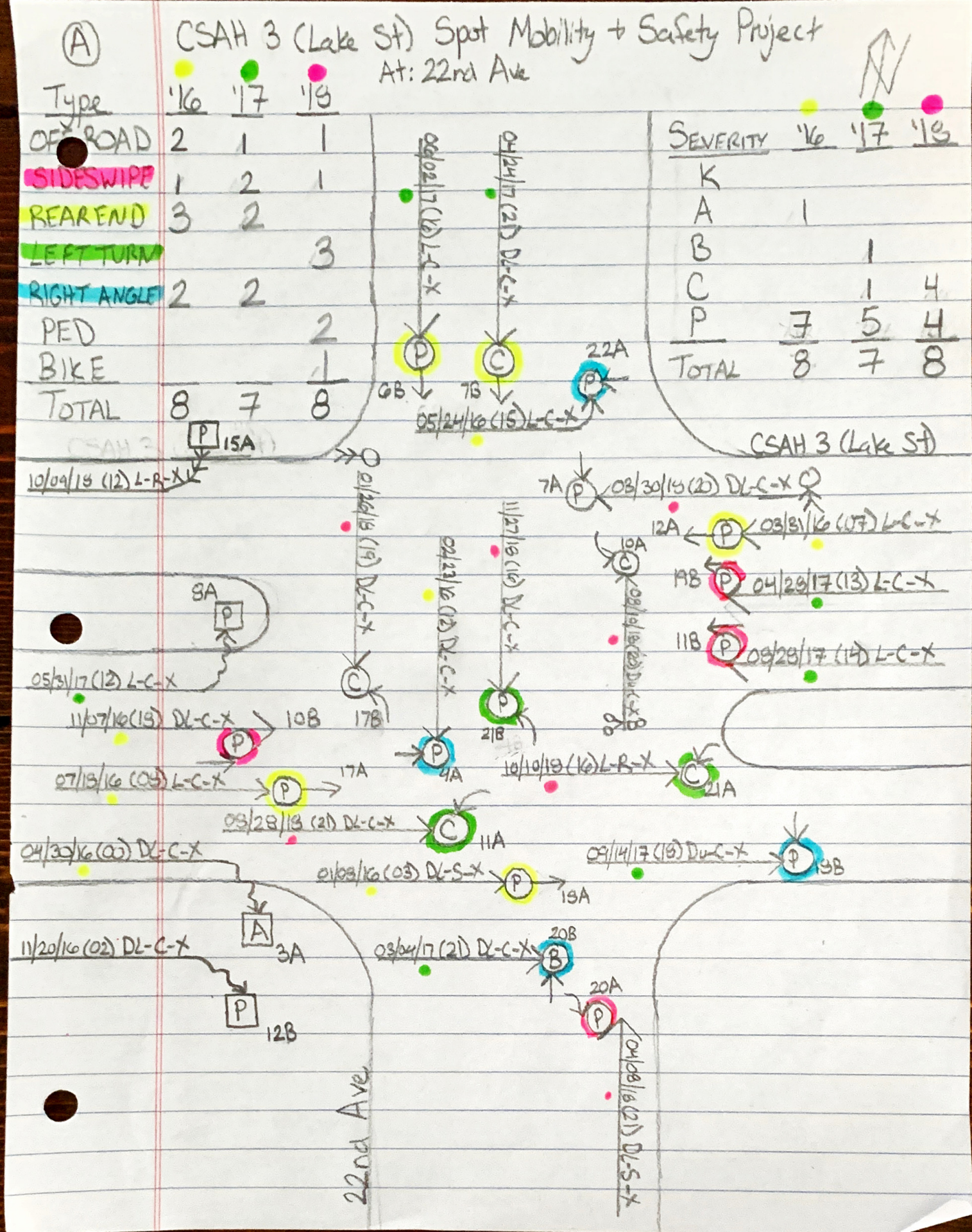
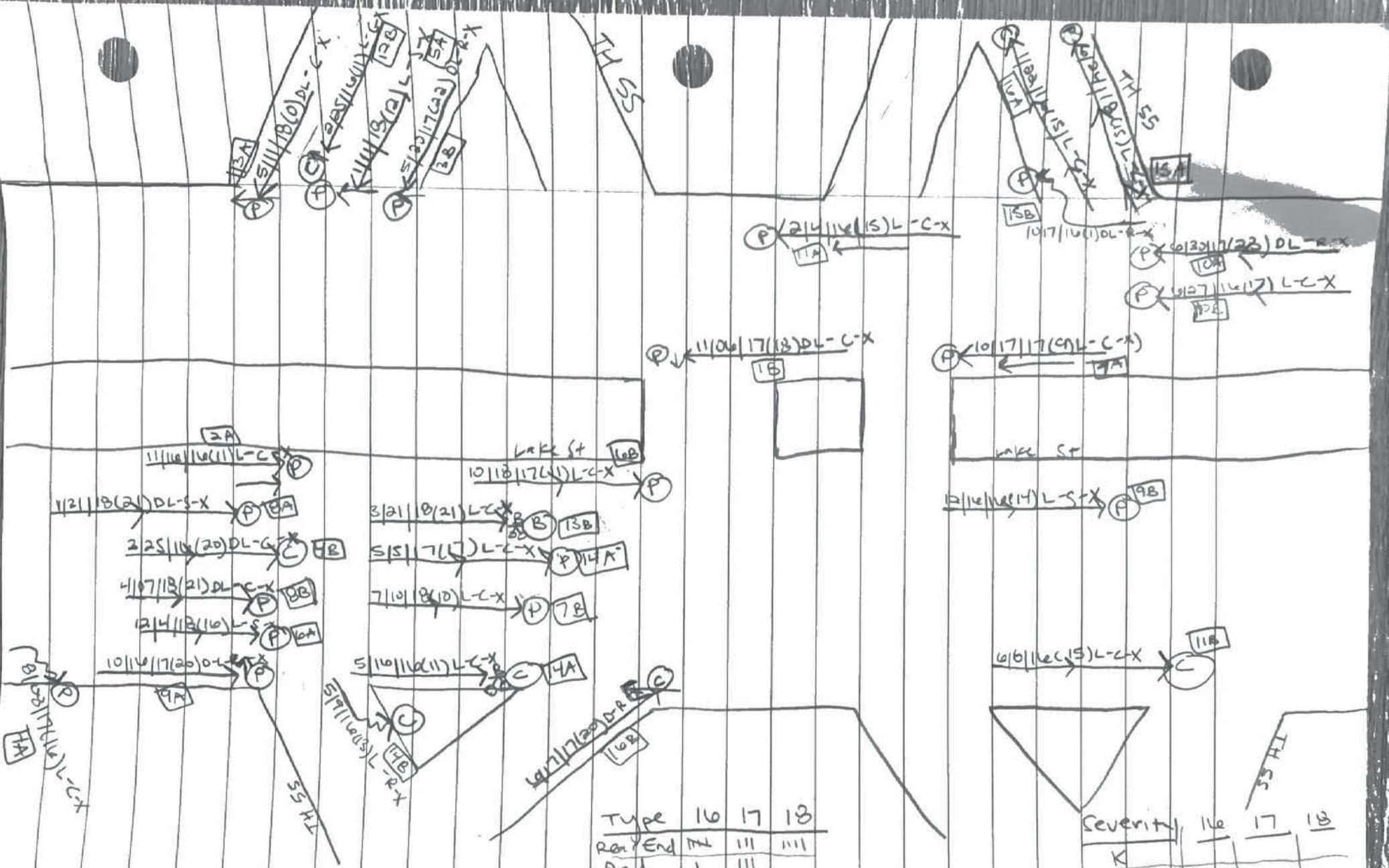
CSAH 3 (Lake St) Spot Mobility + Safety Project

At: 22nd Ave

Type	'16	'17	'18
OFF ROAD	2	1	1
SIDESWIPE	1	2	1
REAREND	3	2	
LEFT TURN			3
RIGHT ANGLE	2	2	
PED			2
BIKE			1
TOTAL	8	7	8

Severity	'16	'17	'18
K			
A	1		
B		1	
C		1	4
P	7	5	4
TOTAL	8	7	8





CSAH 3 (Lake Street) Spot Mobility Project
At TH 55 (Hiawatha)

Type	16	17	18
Rear End	IIII	III	IIII
Ped	1	III	
Bike	1		1
Sideswipe	II	II	
R. Angle			II
Off-road	II	1	
backup			1
	11	9	8

Severity	16	17	18
K			
A			1
B			
C	IIII	1	
P	III	IIII	III
Total	11	9	8

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route	CSAH 3	**District**	Metro	**County**	Hennepin County
Begin RP	14.19	**End RP**	14.25	**Miles**	0.06
Location	At: 22nd Ave				

B. Project Description

Proposed Work	CSAH 3: install additional primary signal head; 22nd Ave: install mast arms, improve intersection lighting		
Project Cost*	$5,659,400	**Installation Year**	2024
Project Service Life	20 years	**Traffic Growth Factor**	0.4%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

0.72	**Fatal (K) Crashes**	**Reference**	CMF 1414: Install additional primary signal head (28% reduction)
0.72	**Serious Injury (A) Crashes**		
0.72	**Moderate Injury (B) Crashes**	**Crash Type**	CMF 1414: RE & SS crashes along CSAH 3
0.72	**Possible Injury (C) Crashes**		
0.72	**Property Damage Only Crashes**		www.CMFclearinghouse.org

D. Crash Modification Factor (optional second CMF)

0.00	**Fatal (K) Crashes**	**Reference**	CMF 1420: Install mast arms (49% reduction)
0.00	**Serious Injury (A) Crashes**		CMF 1420: Improve intersection lighting (42% reduction)
0.51	**Moderate Injury (B) Crashes**	**Crash Type**	CMF 1420: RE, LT, RA, BIKE & PED along 22nd Ave
0.32	**Possible Injury (C) Crashes**		FHWA Desktop Reference: BIKE & PED nighttime crashes
0.47	**Property Damage Only Crashes**		www.CMFclearinghouse.org

E. Crash Data

Begin Date	1/1/2016	**End Date**	12/31/2018	3 years
Data Source	MnCMAT Version 2.0			

Crash Severity	CMF 1414: RE & SS crashes along CSAH 3	CMF 1420: RE, LT, RA, BIKE & PED along 22nd Ave FHWA Desktop Reference: BIKE & PED nighttime crashes
K crashes	0	0
A crashes	0	0
B crashes	0	1
C crashes	0	3
PDO crashes	6	6

F. Benefit-Cost Calculation

$2,382,249	**Benefit (present value)**
$5,659,400	**Cost**

B/C Ratio = 0.43

Proposed project expected to reduce 3 crashes annually, 0 of which involving fatality or serious injury.

F. Analysis Assumptions

Crash Severity	Crash Cost
K crashes	$1,360,000
A crashes	$680,000
B crashes	$210,000
C crashes	$110,000
PDO crashes	$12,000

Link: mndot.gov/planning/program/appendix_a.html

Real Discount Rate	1.2%
Traffic Growth Rate	0.4%
Project Service Life	20 years

G. Annual Benefit

Crash Severity	Crash Reduction	Annual Reduction	Annual Benefit
K crashes	0.00	0.00	$0
A crashes	0.00	0.00	$0
B crashes	0.49	0.16	$34,300
C crashes	2.03	0.68	$74,470
PDO crashes	4.88	1.63	$19,536
			$128,306

H. Amortized Benefit

Year	Crash Benefits	Present Value
2024	$128,306	$128,306
2025	$128,819	$127,292
2026	$129,335	$126,285
2027	$129,852	$125,287
2028	$130,371	$124,297
2029	$130,893	$123,314
2030	$131,416	$122,339
2031	$131,942	$121,372
2032	$132,470	$120,413
2033	$133,000	$119,461
2034	$133,532	$118,517
2035	$134,066	$117,580
2036	$134,602	$116,650
2037	$135,140	$115,728
2038	$135,681	$114,813
2039	$136,224	$113,906
2040	$136,769	$113,005
2041	$137,316	$112,112
2042	$137,865	$111,226
2043	$138,416	$110,346
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0

Total = $2,382,249

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route	CSAH 3	**District**	Metro	**County**	Hennepin County
Begin RP	14.26	**End RP**	14.39	**Miles**	0.13
Location	At: TH 55 (Hiawatha Ave)				

B. Project Description

Proposed Work	CSAH 3: add primary signal head, remove channelized turn islands & construct raised medians		
Project Cost*	$5,659,400	**Installation Year**	2024
Project Service Life	20 years	**Traffic Growth Factor**	0.4%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

0.00	**Fatal (K) Crashes**	**Reference**	CMF 8431: Improve the angle of RTs (60.3% reduction)
0.00	**Serious Injury (A) Crashes**		CMF 1417: Install primary signal head (28% reduction)
0.00	**Moderate Injury (B) Crashes**	**Crash Type**	CMF 8431: crashes involving right turning vehicles
0.51	**Possible Injury (C) Crashes**		CMF 1417: RE crashes involving EB vehicles
0.60	**Property Damage Only Crashes**		www.CMFclearinghouse.org

D. Crash Modification Factor (optional second CMF)

0.44	**Fatal (K) Crashes**	**Reference**	FHWA Desktop Reference: Install refuge island (56% reduction)
0.44	**Serious Injury (A) Crashes**		
0.44	**Moderate Injury (B) Crashes**	**Crash Type**	FHWA Desktop Reference: BIKE & PED crashes
0.44	**Possible Injury (C) Crashes**		
0.44	**Property Damage Only Crashes**		www.CMFclearinghouse.org

E. Crash Data

Begin Date	1/1/2016	**End Date**	12/31/2018	3 years
Data Source	MnCMAT Version 2.0			

Crash Severity	CMF 8431: crashes invovling RT veh CMF 1417: RE crashes	FHWA Desktop Reference: BIKE & PED crashes
K crashes	0	0
A crashes	0	0
B crashes	0	1
C crashes	3	1
PDO crashes	8	2

F. Benefit-Cost Calculation

$2,441,465	**Benefit (present value)**
$5,659,400	**Cost**

B/C Ratio = 0.44

Proposed project expected to reduce 3 crashes annually, 0 of which involving fatality or serious injury.

G. Analysis Assumptions

Crash Severity	Crash Cost
K crashes	$1,360,000
A crashes	$680,000
B crashes	$210,000
C crashes	$110,000
PDO crashes	$12,000

Link: mndot.gov/planning/program/appendix_a.html

Real Discount Rate	1.2%
Traffic Growth Rate	0.4%
Project Service Life	20 years

H. Annual Benefit

Crash Severity	Crash Reduction	Annual Reduction	Annual Benefit
K crashes	0.00	0.00	$0
A crashes	0.00	0.00	$0
B crashes	0.56	0.19	$39,200
C crashes	2.05	0.68	$74,983
PDO crashes	4.33	1.44	$17,312
			$131,495

I. Amortized Benefit

Year	Crash Benefits	Present Value
2024	$131,495	$131,495
2025	$132,021	$130,456
2026	$132,549	$129,425
2027	$133,080	$128,401
2028	$133,612	$127,386
2029	$134,146	$126,379
2030	$134,683	$125,380
2031	$135,222	$124,389
2032	$135,763	$123,406
2033	$136,306	$122,430
2034	$136,851	$121,463
2035	$137,398	$120,502
2036	$137,948	$119,550
2037	$138,500	$118,605
2038	$139,054	$117,667
2039	$139,610	$116,737
2040	$140,168	$115,814
2041	$140,729	$114,899
2042	$141,292	$113,990
2043	$141,857	$113,089
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0

Total = $2,441,465

CRASH MODIFICATION FACTORS CLEARINGHOUSE

CMF / CRF DETAILS

CMF ID: 1414

ADD SIGNAL (ADDITIONAL PRIMARY HEAD)

DESCRIPTION:

PRIOR CONDITION: INTERSECTION HAS ONE PRIMARY SIGNAL HEAD PER APPROACH

CATEGORY: INTERSECTION TRAFFIC CONTROL

STUDY: *SAFETY BENEFITS OF ADDITIONAL PRIMARY SIGNAL HEADS*, FELIPE ET AL., 1998

Star Quality Rating:	★★★☆☆ [VIEW SCORE DETAILS]

Crash Modification Factor (CMF)	
Value:	0.72
Adjusted Standard Error:	
Unadjusted Standard Error:	

Crash Reduction Factor (CRF)	
Value:	28 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	

Applicability	
Crash Type:	All
Crash Severity:	All
Roadway Types:	Not specified
Number of Lanes:	
Road Division Type:	
Speed Limit:	
Area Type:	Urban
Traffic Volume:	
Average Traffic Volume:	
Time of Day:	
If countermeasure is intersection-based	

Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	4-leg
Traffic Control:	Signalized
Major Road Traffic Volume:	
Minor Road Traffic Volume:	
Average Major Road Volume :	
Average Minor Road Volume :	

Development Details	
Date Range of Data Used:	
Municipality:	Richmond, British Columbia
State:	
Country:	Canada
Type of Methodology Used:	Before/after using empirical Bayes or full Bayes
Sample Size (sites):	8 sites after

Other Details	
Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	Dec-01-2009
Comments:	The authors state that "three year of data were used for this analysis" (p. 7). This statement does not indicate if the b was 3 years, the after period was 3 years, both were 3 years, or the total time period was 3 years (i.e. 1.5 years for bef and 1.5 years for after period).

VIEW THE FULL STUDY DETA

EXPORT DETAIL PAGE AS A P

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For more information, contact Karen Scurry at **karen.scurry@dot.gov**

CRASH MODIFICATION FACTORS CLEARINGHOUSE

CMF / CRF DETAILS

CMF ID: 1417

ADD SIGNAL (ADDITIONAL PRIMARY HEAD)

DESCRIPTION:

PRIOR CONDITION: INTERSECTION HAS ONE PRIMARY SIGNAL HEAD PER APPROACH

CATEGORY: INTERSECTION TRAFFIC CONTROL

STUDY: *SAFETY BENEFITS OF ADDITIONAL PRIMARY SIGNAL HEADS*, FELIPE ET AL., 1998

Star Quality Rating:	★★★☆☆ [VIEW SCORE DETAILS]

Crash Modification Factor (CMF)	
Value:	0.72
Adjusted Standard Error:	
Unadjusted Standard Error:	

Crash Reduction Factor (CRF)	
Value:	28 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	

Applicability	
Crash Type:	Rear end
Crash Severity:	All
Roadway Types:	Not specified
Number of Lanes:	
Road Division Type:	
Speed Limit:	
Area Type:	Urban
Traffic Volume:	
Average Traffic Volume:	
Time of Day:	
If countermeasure is intersection-based	

Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	4-leg
Traffic Control:	Signalized
Major Road Traffic Volume:	
Minor Road Traffic Volume:	
Average Major Road Volume :	
Average Minor Road Volume :	

Development Details	
Date Range of Data Used:	
Municipality:	Richmond, British Columbia
State:	
Country:	Canada
Type of Methodology Used:	Before/after using empirical Bayes or full Bayes
Sample Size (sites):	8 sites after

Other Details	
Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	Dec-01-2009
Comments:	The authors state that "three year of data were used for this analysis" (p. 7). This statement does not indicate if the b was 3 years, the after period was 3 years, both were 3 years, or the total time period was 3 years (i.e. 1.5 years for bef and 1.5 years for after period).

VIEW THE FULL STUDY DETA

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For more information, contact Karen Scurry at **karen.scurry@dot.gov**

CRASH MODIFICATION FACTORS CLEARINGHOUSE

CMF / CRF DETAILS

CMF ID: 1420

CONVERT SIGNAL FROM PEDESTAL-MOUNTED TO MAST ARM

DESCRIPTION:

PRIOR CONDITION: EXISTING PEDESTALS WERE REMOVED AND REPLACED WITH MAST ARM SIGNALS

CATEGORY: INTERSECTION TRAFFIC CONTROL

STUDY: *SIGNALIZED INTERSECTIONS: INFORMATIONAL GUIDE*, RODEGERDTS ET AL., 2004

Star Quality Rating:	★★★☆☆ [VIEW SCORE DETAILS]

Crash Modification Factor (CMF)	
Value:	0.51
Adjusted Standard Error:	
Unadjusted Standard Error:	0.031

Crash Reduction Factor (CRF)	
Value:	49 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	3.1

Applicability	
Crash Type:	All
Crash Severity:	All
Roadway Types:	Not specified
Number of Lanes:	
Road Division Type:	
Speed Limit:	
Area Type:	
Traffic Volume:	
Average Traffic Volume:	
Time of Day:	All
If countermeasure is intersection-based	

Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	
Traffic Control:	Signalized
Major Road Traffic Volume:	
Minor Road Traffic Volume:	
Average Major Road Volume :	
Average Minor Road Volume :	

Development Details	
Date Range of Data Used:	
Municipality:	
State:	KS
Country:	usa
Type of Methodology Used:	Simple before/after
Sample Size (crashes):	809 crashes before, 412 crashes after

Other Details	
Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	Dec-01-2009
Comments:	

VIEW THE FULL STUDY DETA

EXPORT DETAIL PAGE AS A P

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CRASH MODIFICATION FACTORS CLEARINGHOUSE

CMF / CRF DETAILS

CMF ID: 8431

IMPROVE ANGLE OF CHANNELIZED RIGHT TURN LANE

DESCRIPTION: CHANGES MADE TO THE STUDY APPROACHES INCLUDE: SHARPENING THE FLAT APPROACH ANGLE TYPICAL IN TRADITIONAL DESIGNS, REDUCING THE RADIUS, ADJUSTING THE STOP BAR POSITION, AND MODIFYING THE CO INCREASE THE LINE OF SIGHT OF APPROACHING THROUGH TRAFFIC.

PRIOR CONDITION: VARIED DEPENDING ON INTERSECTION

CATEGORY: INTERSECTION GEOMETRY

STUDY: *SAFETY IMPACTS OF A MODIFIED RIGHT TURN LANE DESIGN AT INTERSECTIONS*, SCHATTLER AND HANSON, 2016

Star Quality Rating:	★★★★☆ [VIEW SCORE DETAILS]

Crash Modification Factor (CMF)	
Value:	0.397
Adjusted Standard Error:	
Unadjusted Standard Error:	0.107

Crash Reduction Factor (CRF)	
Value:	60.3 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	10.7

Applicability	
Crash Type:	Right turn,Other
Crash Severity:	All
Roadway Types:	Not specified
Number of Lanes:	1 to 3
Road Division Type:	
Speed Limit:	
Area Type:	Not specified
Traffic Volume:	
Average Traffic Volume:	
Time of Day:	All
If countermeasure is intersection-based	

Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	Not specified
Traffic Control:	Other
Major Road Traffic Volume:	
Minor Road Traffic Volume:	
Average Major Road Volume :	
Average Minor Road Volume :	

Development Details	
Date Range of Data Used:	2003 to 2016
Municipality:	Peoria
State:	IL
Country:	USA
Type of Methodology Used:	Before/after using empirical Bayes or full Bayes
Sample Size (crashes):	161 crashes before, 45 crashes after
Sample Size (sites):	7 sites before, 7 sites after
Sample Size (site-years):	21 site-years before, 21 site-years after

Other Details	
Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	Jan-17-2017
Comments:	Crash type = "right turn related crashes at subject approach". Total intersection AADT ranged from 3300 to 41300. G intersections analyzed included both signalized and stop-controlled intersections.

VIEW THE FULL STUDY DETA

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Countermeasure(s)	Crash Type	Crash Severity	Area Type	Config	Control	Major Daily Traffic Volume (veh/day)	Minor Daily Traffic Volume (veh/day)	Ref	Obs	Effectiveness: Crash Reduction Factor / Function	Effectiveness: Std Error	Effectiveness: Range Low	Effectiveness: Range High	Study Type
Prohibit right-turn-on-red (cont'd)	All	All	Urban/ Suburban		Signal			62		100(1-(0.984)^n); n=number of signalized intersection appraoches where RTOR is prohibited				Expert Panel
	Right-angle	All			Signal			15		30				Cross-section
	Sideswipe	All			Signal			15		20				Cross-section
Prohibit turns	All turns	All	All					1		45		40	90	
Restrict parking near intersections (to off-street)	All	All						28		49		8	90	
	Ped	All						15		30				
Vary speed	All	All	Rural					6		100(1-EXP(0.019(V-55))); V=major-road speed limit (or design speed) (mph)				
	All	All	Urban					6		100(1-EXP(0.005(V-40))); V=major-road speed limit (or design speed) (mph)				
LIGHTING														
Improve lighting at intersection	Ped	Fatal						5		78	87			
	Ped	Injury						5		**42**	18			
Install lighting	All	All			Signal			51		30				
	All	Fatal/Injury			Signal			51		17				
	Night	All			Signal			51		50				
	All	All			No Signal			28		47				
	All	All						62		4				Meta Analysis/ Expert Panel
	All	Injury						62		6				Meta Analysis/ Expert Panel
	Night	All						62		21				Meta Analysis/ Expert Panel
	Night	Injury						62		29				Meta Analysis/ Expert Panel

Countermeasures	Crash Type	Crash Severity	Area Type	Ref	Obs	Effectiveness				
						Crash Reduction Factor / Function	Std Error	Range		Study Type
								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

Minneapolis
City of Lakes

Public Works
350 S. Fifth St. - Room 239
Minneapolis, MN 55415
TEL 612.673.3000
www.minneapolismn.gov

Support for Hennepin County
Regional Solicitation Applications

Dear Ms. Stueve:

Hennepin County has requested letters of support for a series of grant applications as part of the Regional Solicitation process, by which the Metropolitan Council competitively allocates federal transportation funds. As a part of this request, Minneapolis conducted a review of completed plans, studies, and community engagement, as well as documented priorities and adopted policies to identify which projects to support. Improvements along Hennepin County streets offer significant opportunities to address some of the greatest safety and mobility needs within Minneapolis and are a critical part of the city's goal to address climate change, support mode shifts, and eliminate deaths and severe injuries resulting from traffic crashes.

Minneapolis hereby supports the following applications:

Roadway Reconstruction / Modernization

- Lowry Ave NE (CSAH 153) Reconstruction: Marshall St NE to Washington St NE
- Franklin Ave (CSAH 5) Reconstruction: Blaisdell Ave to Chicago Ave

Spot Mobility and Safety

- Lake St E (CSAH 3) at Hiawatha Ave (TH 55): Intersection

Pedestrian Facilities

- Glenwood Ave (CSAH 40) ADA Upgrades: Penn Ave N (CSAH 2) to Bryant Ave N

Bridges

- Washington Avenue Bridge over Basset Creek (CSAH 152)
- Osseo Rd Bridge over CP Rail (CSAH 152)

At this time, Minneapolis has no funding programmed in its adopted 2020-2024 Transportation Capital Improvement Program (CIP) for these projects. Therefore, Minneapolis is currently unable to commit cost participation in these projects. However, we request that Hennepin County includes city staff as part of the design process to ensure project success. Furthermore, Minneapolis agrees to provide maintenance, such as sweeping and plowing, for protected bikeways included with these projects and in alignment with Minneapolis' proposed All Ages and Abilities Network, until such time Hennepin County has the resources to do so.

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,

Robin Hutcheson
Director of Public Works
City of Minneapolis

DEPARTMENT OF TRANSPORTATION

MnDOT Metro District
1500 West County Road B-2
Roseville, MN 55113

May 12, 2020

Jason Pieper
Hennepin County Public Works
1600 Prairie Drive
Medina, MN 55340

Re: MnDOT Letter for Hennepin County
Metropolitan Council/Transportation Advisory Board 2020 Regional Solicitation Funding Request for CSAH 3 (Lake St.) Pedestrian Project

Dear Jason Pieper,

This letter documents MnDOT Metro District's recognition for Hennepin County to pursue funding for the Metropolitan Council/Transportation Advisory Board's (TAB) 2020 Regional Solicitation for CSAH 3 (Lake St.) Pedestrian Project.

As proposed, this project impacts MnDOT right-of-way on TH 55. As the agency with jurisdiction over TH 55, MnDOT will allow Hennepin County to seek improvements proposed in the application for the CSAH 3 Bridge project. If funded, details of any future maintenance agreement with Hennepin County will need to be determined during project development to define how the improvements will be maintained for the project's useful life.

Metro District does have other roadway investments planned to occur nearby and on this roadway over the next 5-6 years. Please coordinate project development with MnDOT Area staff so that our agencies can work together to best leverage our respective efforts. Due to expected loss of future state and federal transportation revenues as a result of the COVID-19 pandemic, there is likely to be significant disruptions to the current MnDOT construction program that will surface in the next year.

MnDOT Metro District looks forward to continued cooperation with Hennepin County as this project moves forward and as we work together to improve safety and travel options within the Metro Area. If you have questions or require additional information at this time, please reach out to West Area Manager April Crockett at April.Crockett@state.mn.us or 651-234-7728.

Sincerely,

Michael Barnes

Digitally signed by Michael Barnes
Date: 2020.05.12 18:15:54 -05'00'

Michael Barnes, PE
Metro District Engineer
CC: April Crockett, Metro District Area Manager
Molly McCartney, Metro Program Director
Dan Erickson, Metro State Aid Engineer