# Intersection Mobility and Safety Study

## Transportation Committee

METROPOLITAN COUNCIL

May 13, 2024

# Project Overview

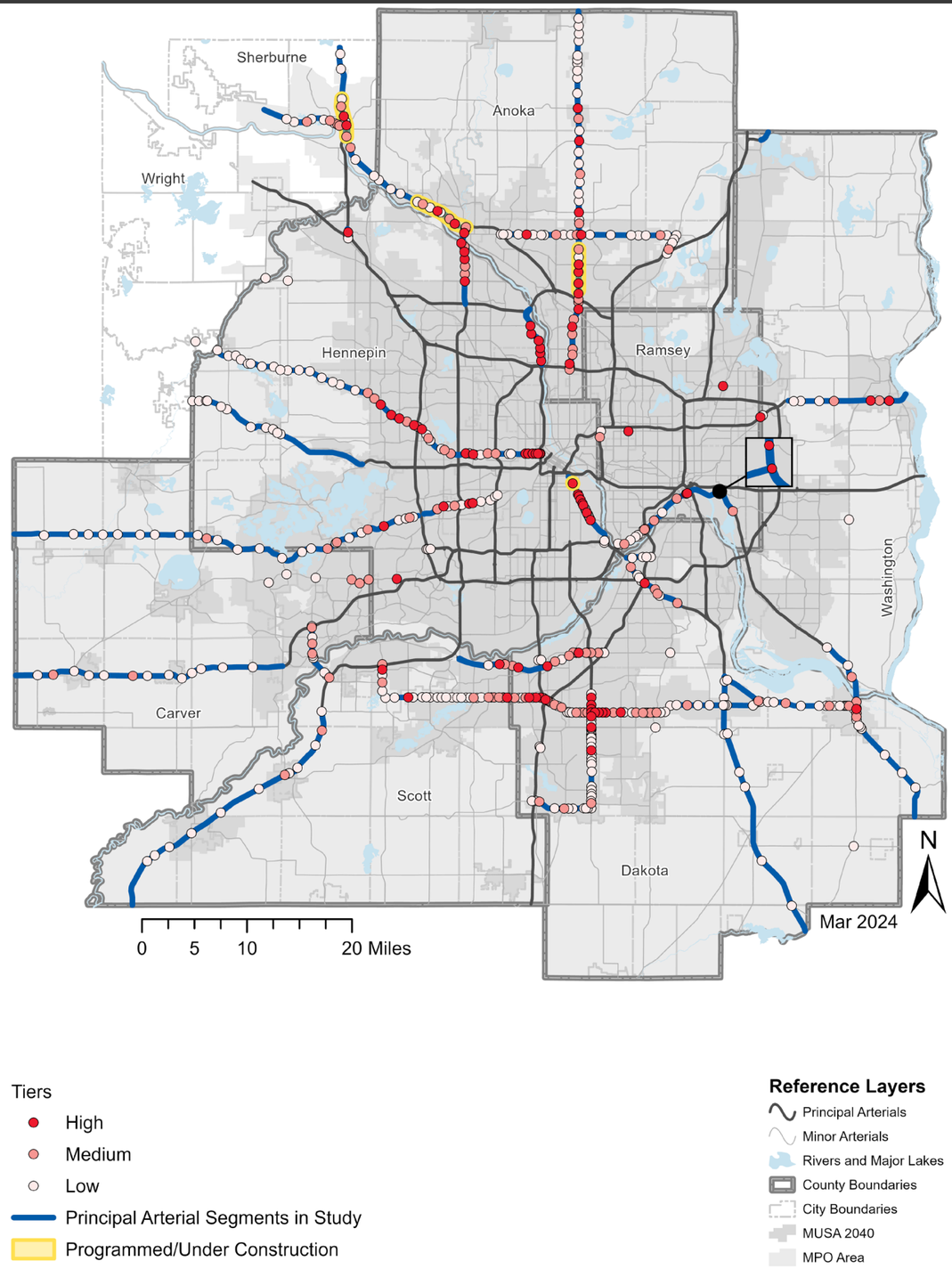
# Intersection Mobility and Safety Study

## Study Background

- Analyze before-and-after conditions of previous projects
- Prioritize intersections (high, medium, low – similar to the 2017 Principal Arterial Intersection Conversion Study)
- Use this information to influence project scoping in the short term, and long-range investment planning
  - Identify regional priorities for the 2050 Transportation Policy Plan (TPP) and Regional Solicitation

# Study Locations

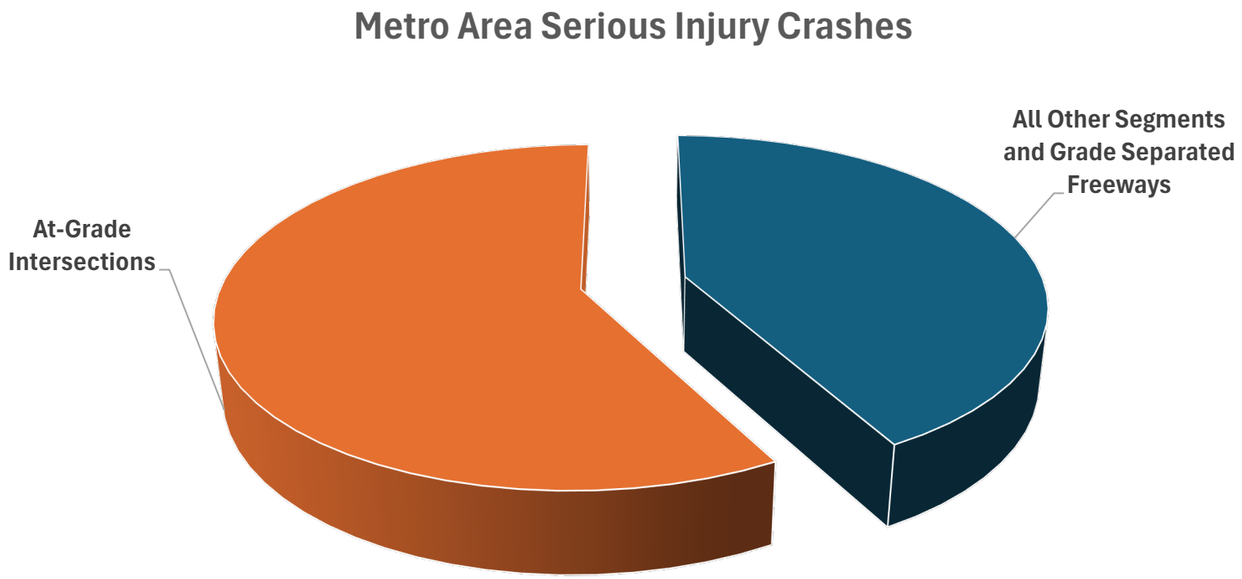
- The Intersection Mobility and Safety Study focused on principal arterials with at-grade intersections (i.e., excluded freeways like I-94 and I-35).
- While planning studies should occur at corridor level, projects are often delivered at the intersection-level due to a lack of funding and other constraints.
- MnDOT has focused more on preservation over the past 15 years so activities such as planning studies, funding pursuits, and even construction has been completed on major MnDOT intersections by cities and counties. (often with partial funding through the Regional Solicitation).



# Why prioritize intersections?

Intersections are a Core Focus Area in MnDOT's 2020-2024 Strategic Highway Safety Plan with 58% of the fatal and serious injury crashes occurring at intersections from 2018-2022 (on all Twin Cities roadways compared to 47% statewide).

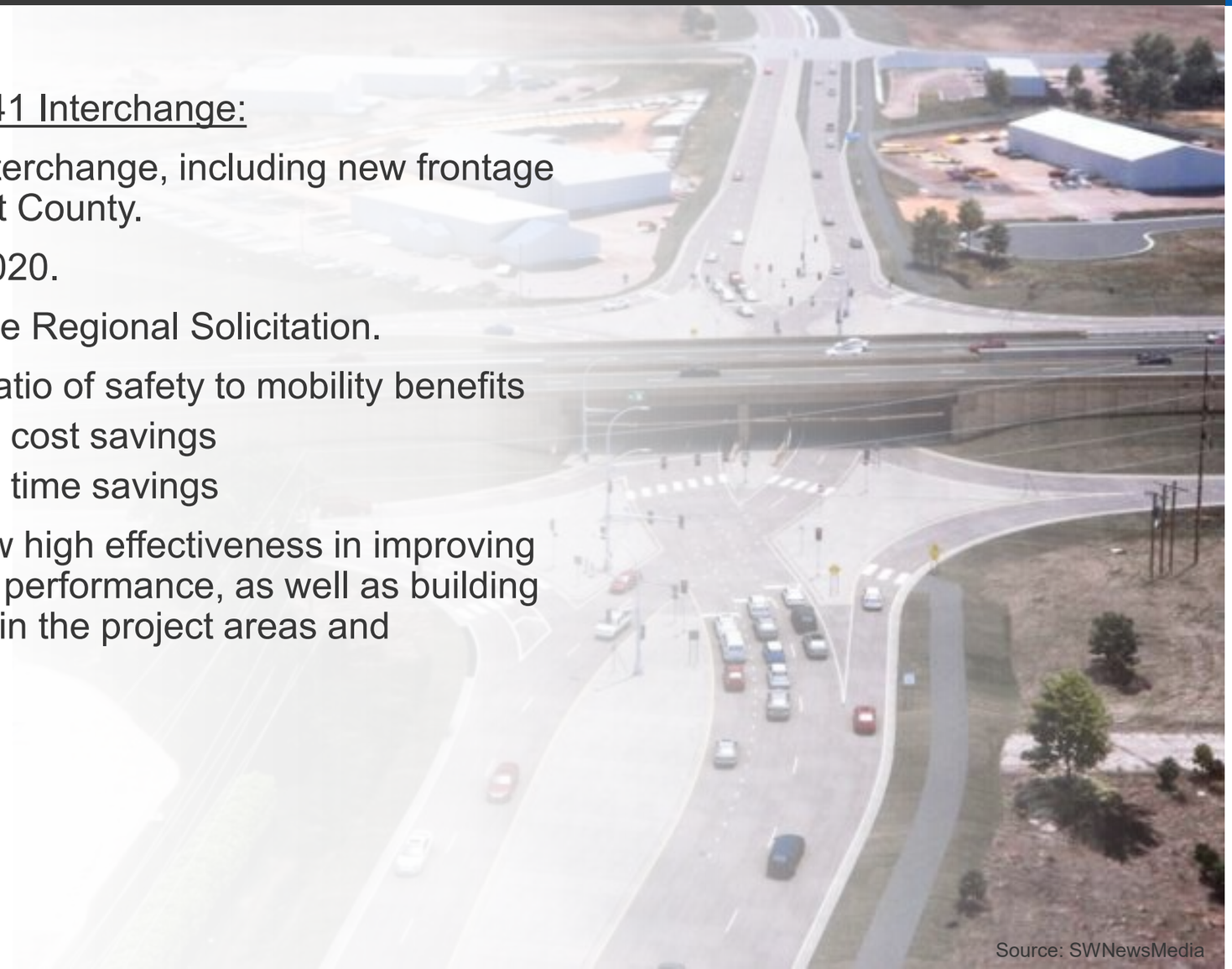
Pedestrian safety is listed as an emerging priority.



# Before-and-After Analysis

Project: Highway 169 and Highway 41 Interchange:

- Converted a traffic signal to an interchange, including new frontage roads, south of Shakopee in Scott County.
- Construction was completed in 2020.
- Project funded, in part, through the Regional Solicitation.
- Annual benefits: Achieved a 3:1 ratio of safety to mobility benefits
  - $5.4 million in annual crash cost savings
  - $1.8 million in annual travel time savings
- Recently completed projects show high effectiveness in improving travel times, reliability, and safety performance, as well as building out missing multimodal elements in the project areas and increasing ADA compliance.



Source: SWNewsMedia

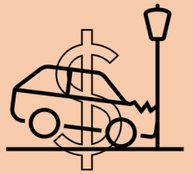
# Needs Summary and Tiering

# Performance Measures

## MOBILITY

| | | |
|---|---|---|
| Total Intersection Delay |  | Daily person-hours for all approaches |
| Peak Period Delay |  | Person-hours for worst approach and worst peak |
| Cross-Street Delay |  | Daily person-hours for cross street approaches |
| Transit Passenger Delay |  | Daily person-hours on buses passing through intersection |

## SAFETY

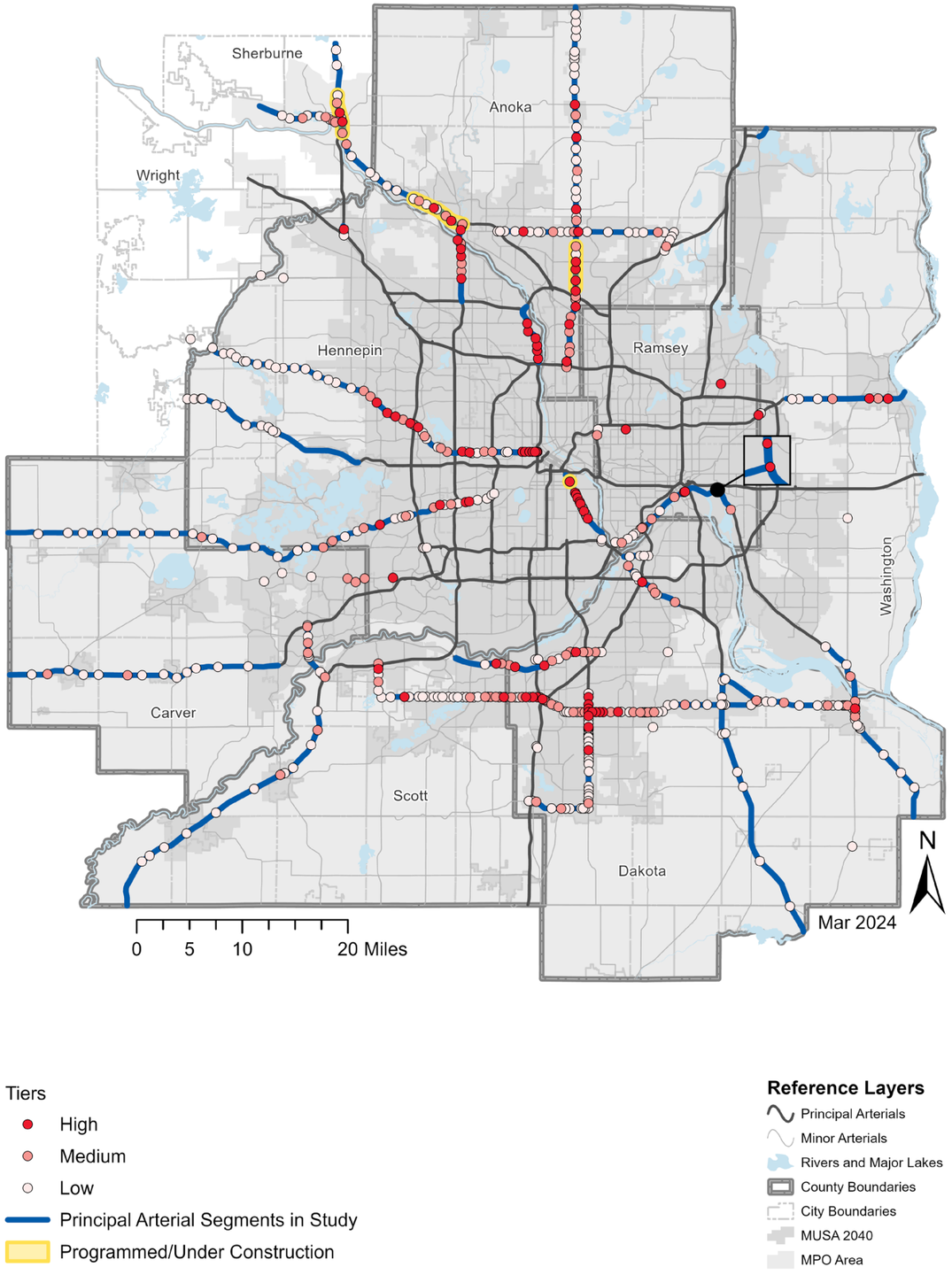
| | | |
|---|---|---|
| Severe Crash Rate |  | Rate of fatal+serious injury crashes over 5 years per MEV |
| Total Crash Cost |  | Total dollar value over 5 years |

## MULTIMODAL & EQUITY

| | | |
|---|---|---|
| SPACE Analysis |  | Aggregate score of 19 factors for ped/bike and equity |

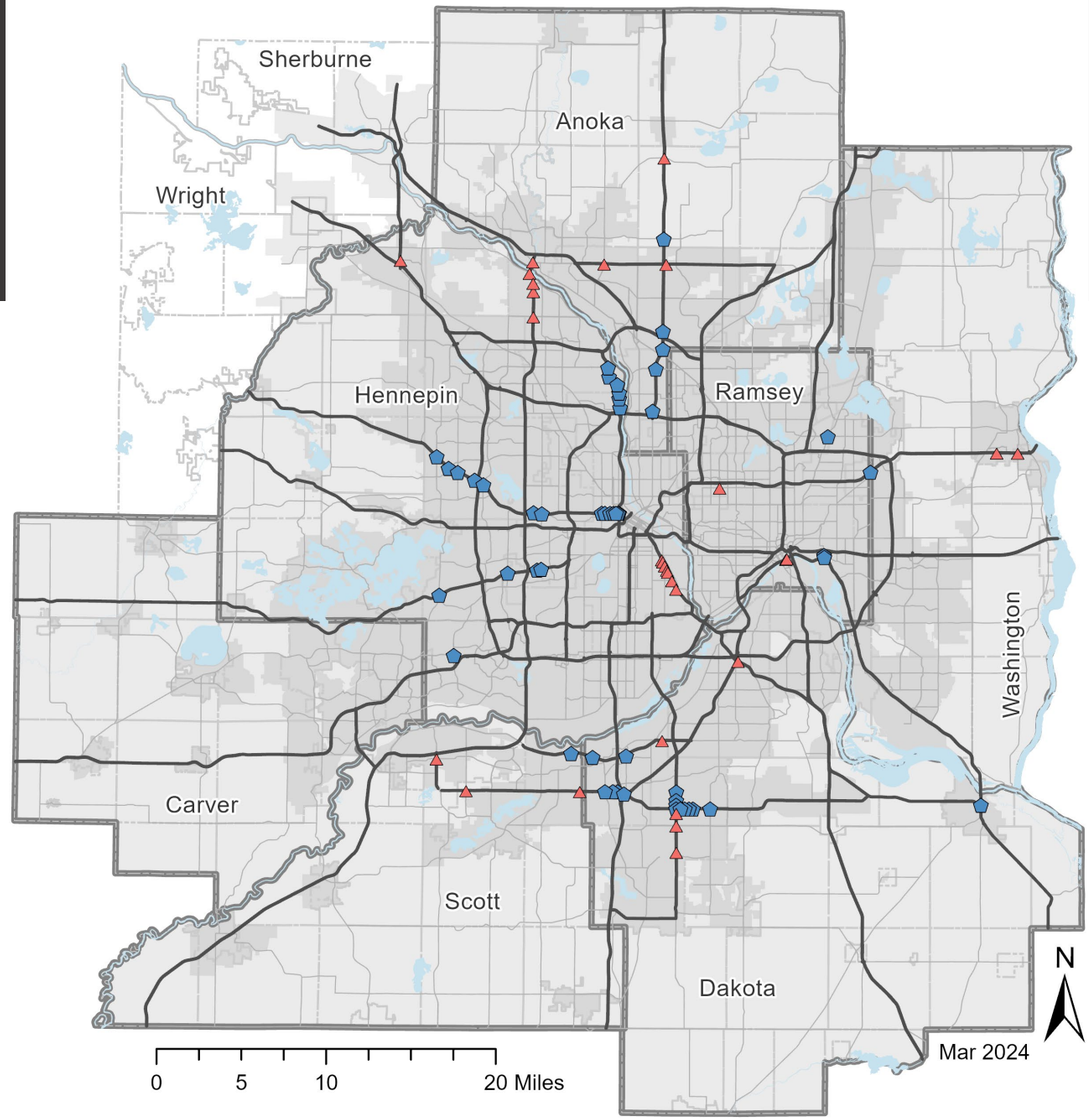
# Map of Tiering Results

- Total of 518 intersections analyzed in study
- Intersections by tier:
  - High: 89
  - Medium: 117
  - Low: 312



# Top Scoring Locations

| Rank | Location |
|---|---|
| 1 | 6TH AVE N & HIGHWAY 55 & LYNDALE AVE N |
| 2 | HWY 51 & CR B |
| 3 | CSAH 23 (CEDAR AVE) & CSAH 42 |
| 4 | HIGHWAY 55 & PENN AVE N |
| 5 | 46TH ST E & HIAWATHA AVE |
| 6 | TH 252 & 85TH AVE |
| 7 | HIGHWAY 55 & LYNDALE AVE N |
| 8 | TH 65 NE & OSBORNE RD |
| 9 | TH 252 & 66TH AVE |
| 10 | CSAH 42 & CSAH 5 |
| 11 | CSAH 23 (CEDAR AVE) & 140TH ST |
| 12 | 38TH ST E & HIAWATHA AVE |
| 13 | 35TH ST E & HIAWATHA AVE |
| 14 | TH 65 & 93RD LN |
| 15 | FERRY ST N & FERRY ST S & MAIN ST W |
| 16 | CEDAR AVE & 160TH ST |
| 17 | HIGHWAY 101 & DIAMOND LAKE RD S |
| 18 | TH 13 & NICOLLET AVE |
| 19 | HIGHWAY 169 & DAYTON RD |
| 20 | CSAH 42 & NICOLLET AVE |




Total high need locations = 80

Study Status

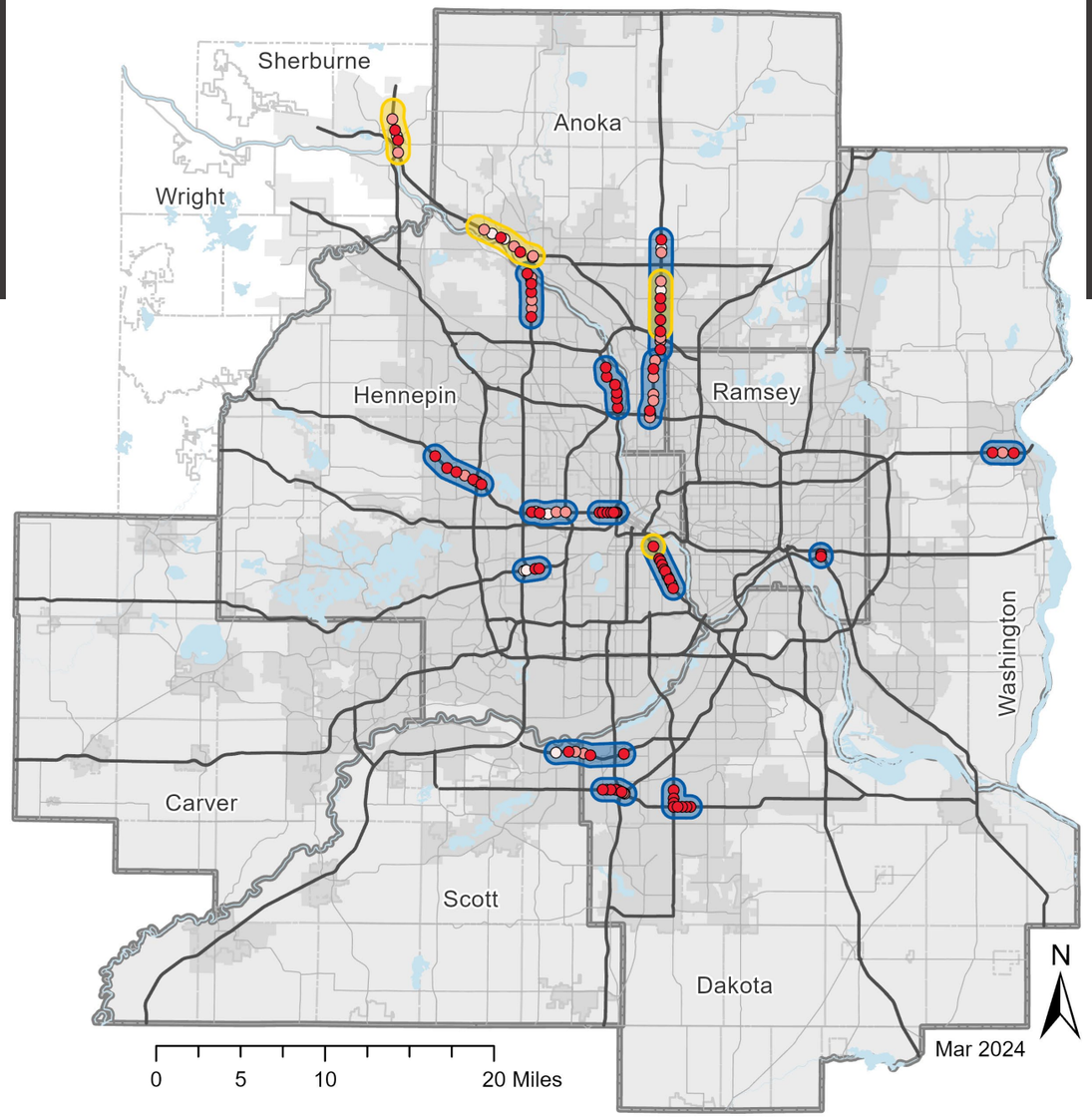
- Locations without Recent or Upcoming Planning Efforts (29)
- Recent, Ongoing, or Planned Study (51)

Reference Layers

- Principal Arterials
- Minor Arterials
- Rivers and Major Lakes
- County Boundaries
- City Boundaries
- MUSA 2040
- MPO Area

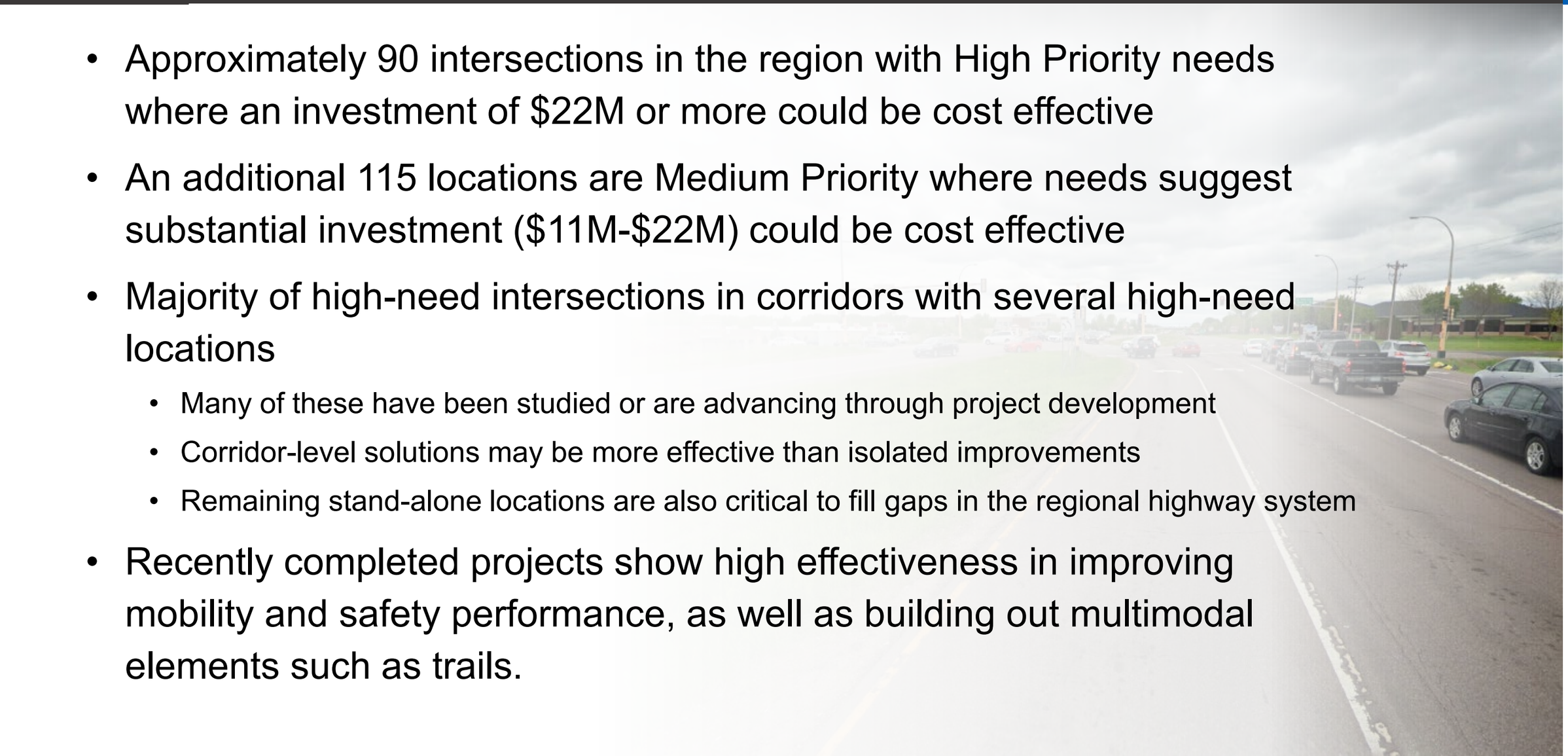
# Corridor Sections

| Corridor Section | Total |
|---|---|
| CSAH 42 and Cedar Ave – Apple Valley | 8 |
| CSAH 42 Burnsville | 10 |
| Elk River Redefine 169 | 5 |
| Highway 10 Anoka and Ramsey | 8 |
| Highway 169 - Champlin | 8 |
| TH 13 Savage and Burnsville | 6 |
| TH 252 | 6 |
| TH 55 Hiawatha | 13 |
| TH 55 Plymouth | 8 |
| TH 61 at Burns and Warner | 2 |
| TH 65 – CR 10 to Bunker Lake Blvd | 13 |
| TH 7 St. Louis Park | 4 |
| TH 36 Oak Park Heights | 3 |
| TH 55 Golden Valley | 7 |
| TH 55 Olson Memorial | 7 |
| TH 65 – I-694 to CR 10 | 8 |



# Findings and Conclusions

- Approximately 90 intersections in the region with High Priority needs where an investment of $22M or more could be cost effective
- An additional 115 locations are Medium Priority where needs suggest substantial investment ($11M-$22M) could be cost effective
- Majority of high-need intersections in corridors with several high-need locations
  - Many of these have been studied or are advancing through project development
  - Corridor-level solutions may be more effective than isolated improvements
  - Remaining stand-alone locations are also critical to fill gaps in the regional highway system
- Recently completed projects show high effectiveness in improving mobility and safety performance, as well as building out multimodal elements such as trails.



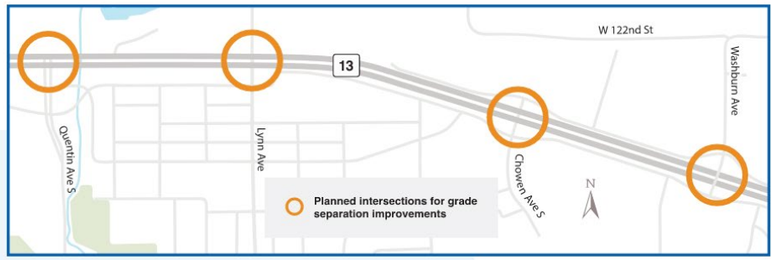
# Implementation & Next Steps

# Implementation Plans
# One Pagers

## Intersection Mobility and Safety Study

### Highway 13: Savage to Burnsville

Quentin Avenue to Washburn Avenue




**Highlight of location needs**

- This corridor has some of the highest levels of vehicle delay during peak periods
- This corridor has a high number of crashes regionally and overall

**Corridor vision**

- Grade separation throughout the corridor and at two key intersections
- Create a freeway facility from Highway 13 to Interstate 35W

**Existing funding opportunities**

- Meets criteria for various programs
- Key funding opportunities include:
  - MPDG
  - RAIS

***Priority criteria***

!!! High need/ high readiness

***Study status***

Complete

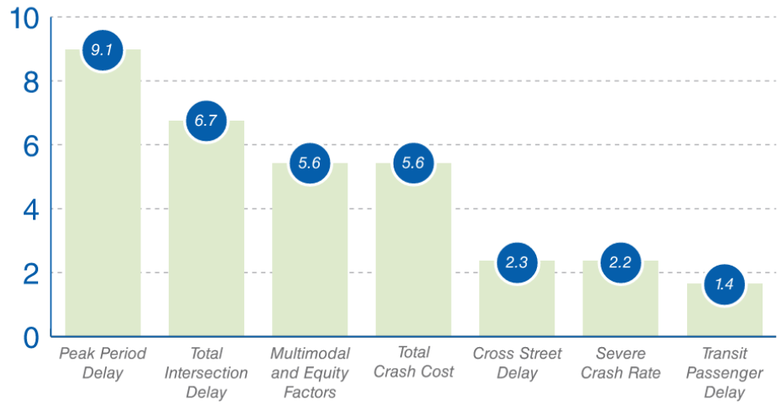
***Environmental doc***

Underway

***Funding status***

$$$ Partial funding: **yes**
Full funding: **no**

**Evaluation scores**

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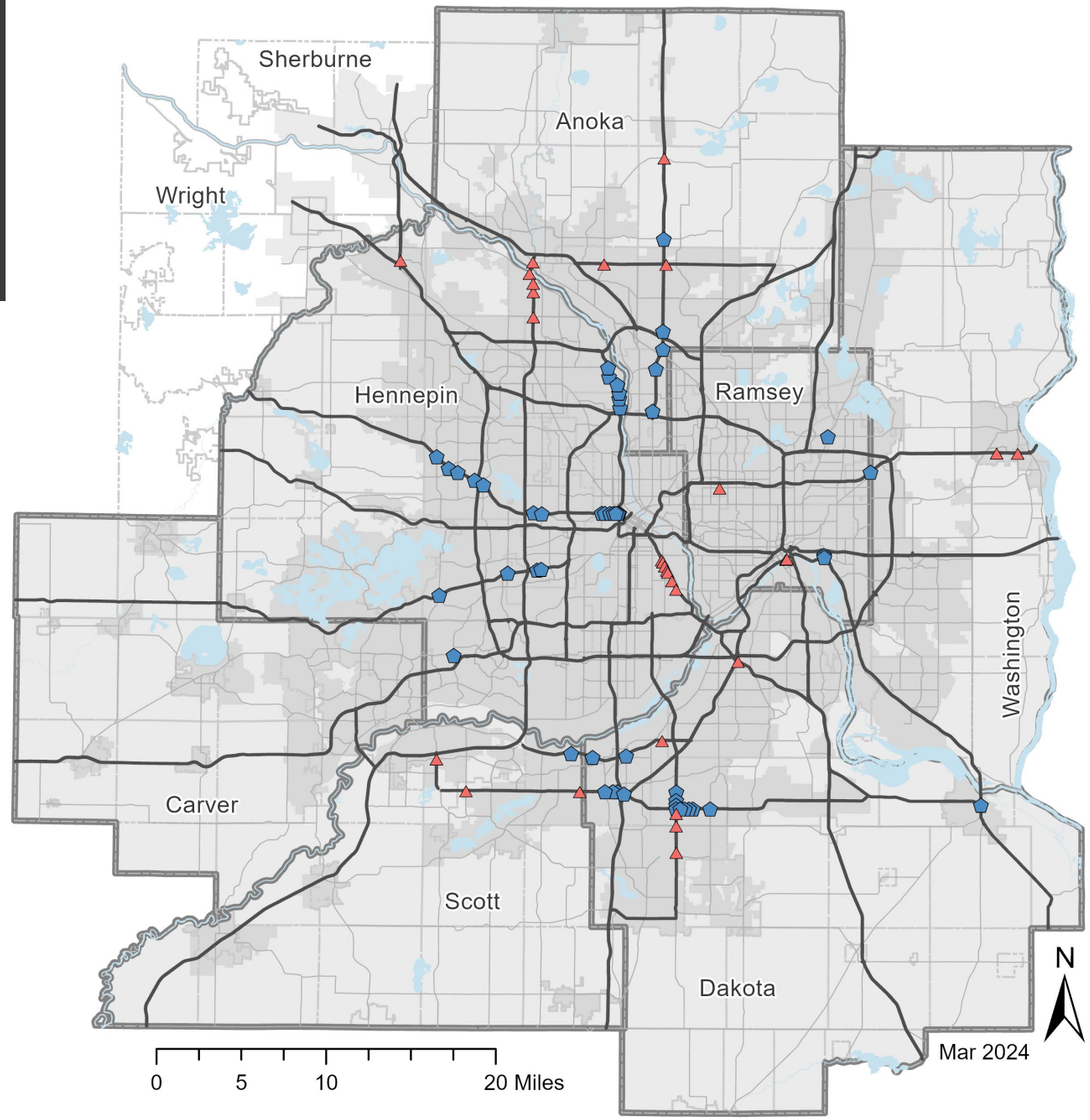
# 2050 TPP

- All high priority locations will be included in the 2050 TPP as “project opportunities” (consistent with similar studies)
- Within high regional priority corridors, several locations that have completed planning work and are also local priorities for grade separations:
  - Highway 13
  - Highway 65
  - Highway 36 and Highway 120
  - Highway 5 and Hennepin CSAH 4
- High priority corridors that have not had a corridor study in the last decade should be prioritized for future study given their high needs



# Questions?

Website:
https://metrocouncil.org/Transportation/System/Highways/Studies/Intersection-Mobility-and-Safety-Study.aspx

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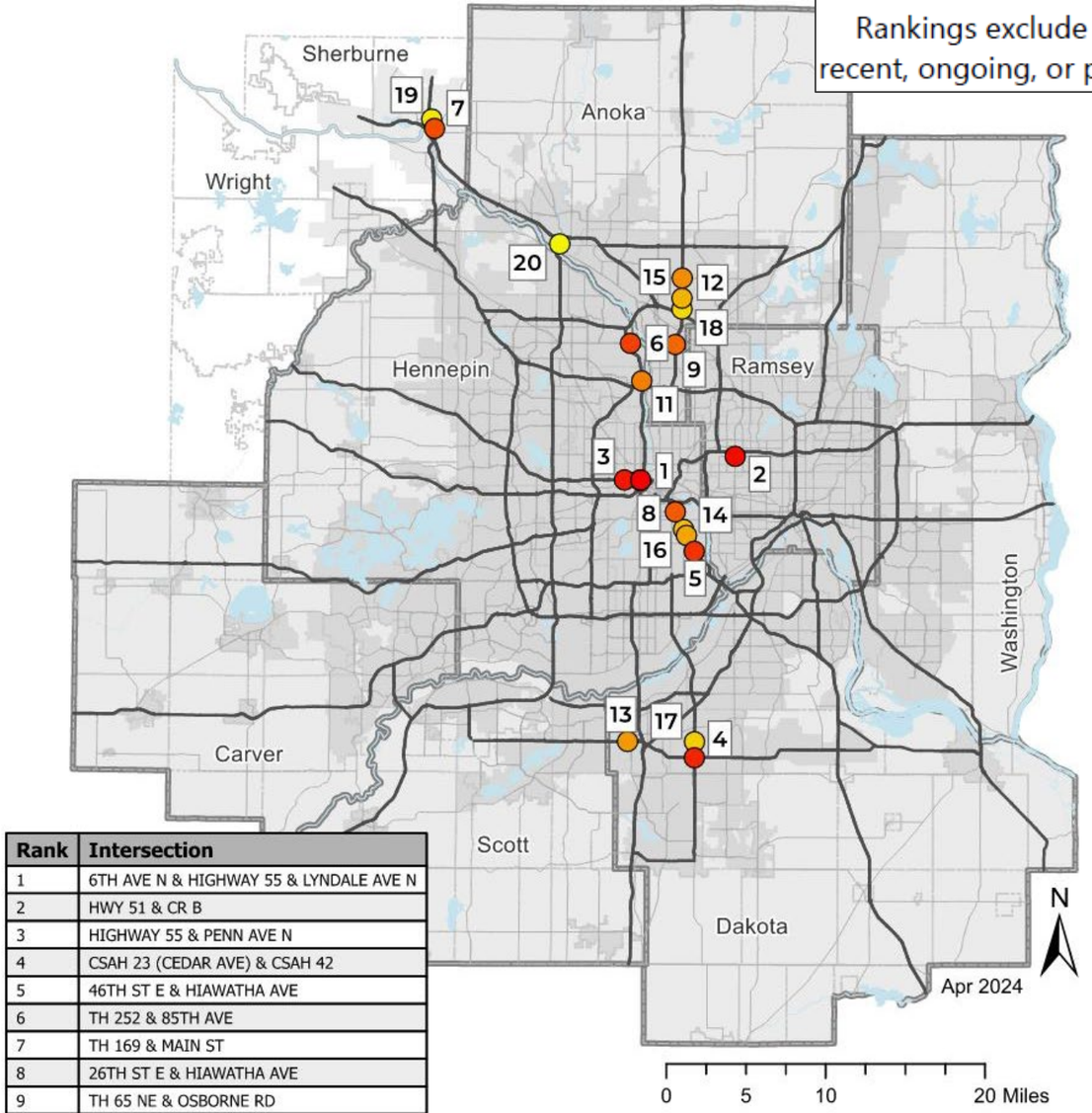
# Top 20 Intersections Overall Score

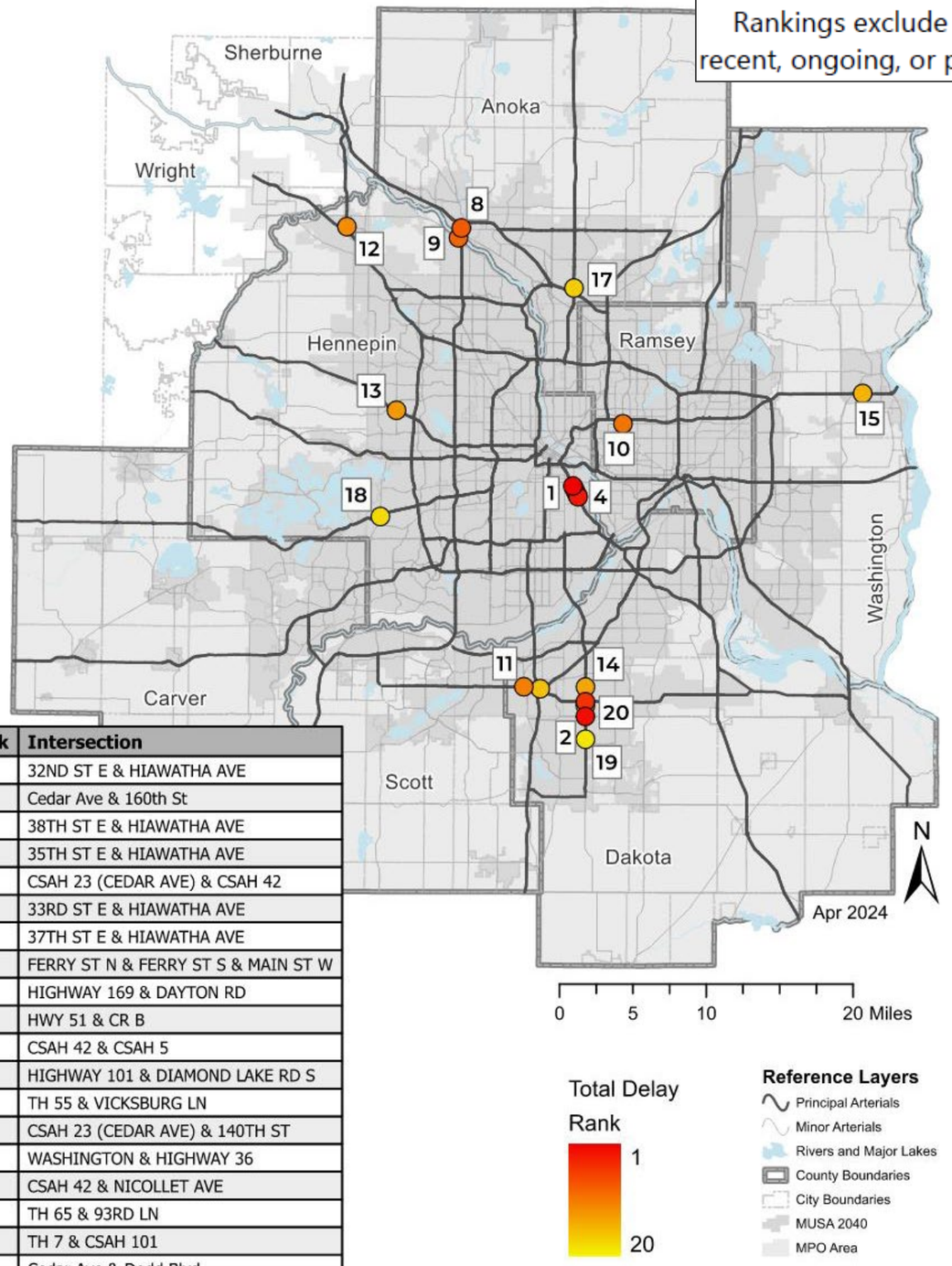
Rankings exclude intersections with recent, ongoing, or programmed projects.




| Rank | Intersection |
|---|---|
| 1 | 6TH AVE N & HIGHWAY 55 & LYNDALE AVE N |
| 2 | HWY 51 & CR B |
| 3 | HIGHWAY 55 & PENN AVE N |
| 4 | CSAH 23 (CEDAR AVE) & CSAH 42 |
| 5 | 46TH ST E & HIAWATHA AVE |
| 6 | TH 252 & 85TH AVE |
| 7 | TH 169 & MAIN ST |
| 8 | 26TH ST E & HIAWATHA AVE |
| 9 | TH 65 NE & OSBORNE RD |
| 10 | HIGHWAY 55 & LYNDALE AVE N |
| 11 | TH 252 & 66TH AVE |
| 12 | TH 65 & 109TH AVE |
| 13 | CSAH 42 & CSAH 5 |
| 14 | 38TH ST E & HIAWATHA AVE |
| 15 | TH 65 & 99TH AVE |
| 16 | 35TH ST E & HIAWATHA AVE |
| 17 | CSAH 23 (CEDAR AVE) & 140TH ST |
| 18 | TH 65 & 93RD LN |
| 19 | TH 169 & SCHOOL ST |
| 20 | TH 169 (FERRY ST) & MAIN ST W |

# Top 20 Intersections Total Delay

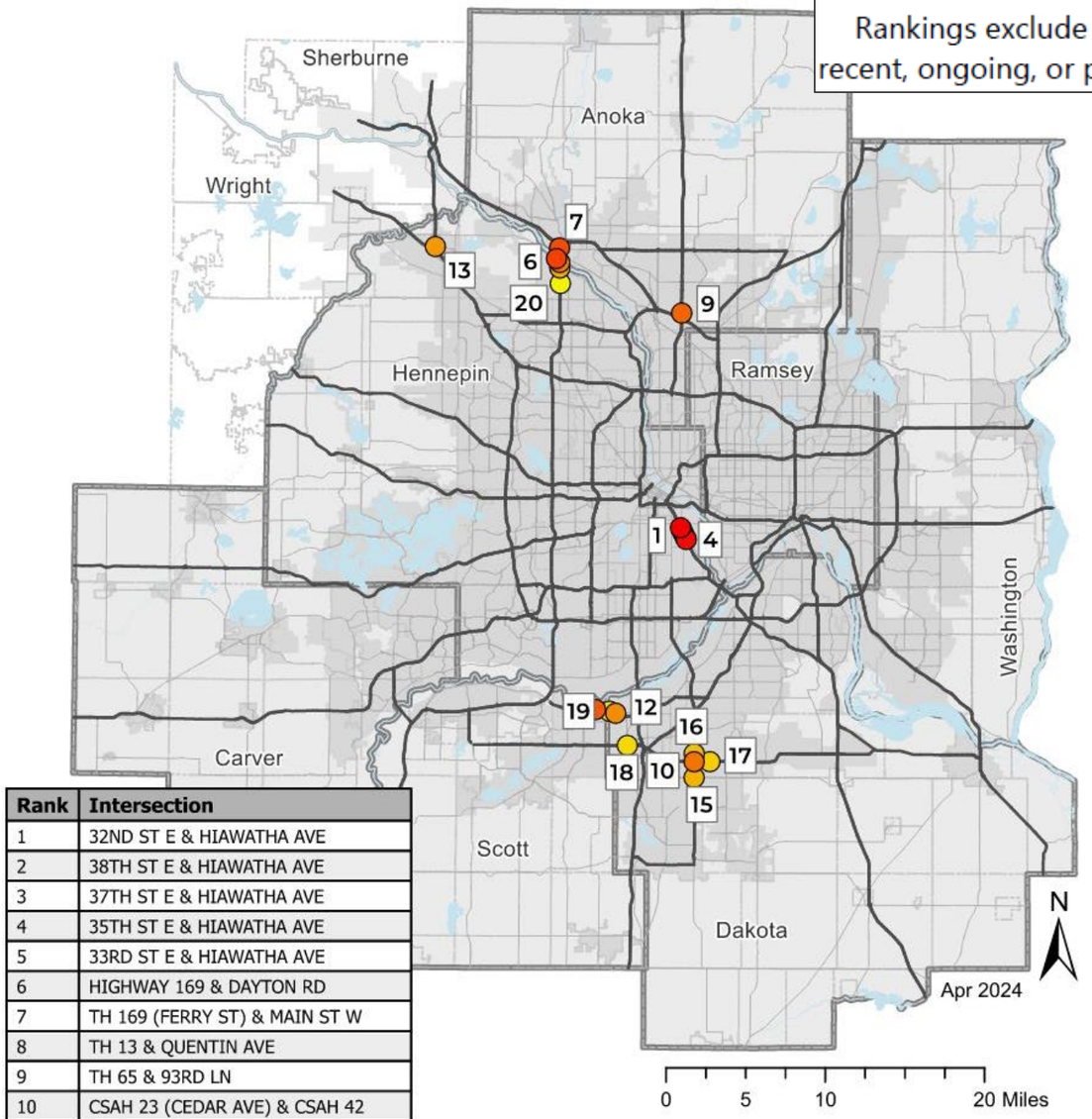
Rankings exclude intersections with recent, ongoing, or programmed projects.




| Rank | Intersection |
|---|---|
| 1 | 32ND ST E & HIAWATHA AVE |
| 2 | Cedar Ave & 160th St |
| 3 | 38TH ST E & HIAWATHA AVE |
| 4 | 35TH ST E & HIAWATHA AVE |
| 5 | CSAH 23 (CEDAR AVE) & CSAH 42 |
| 6 | 33RD ST E & HIAWATHA AVE |
| 7 | 37TH ST E & HIAWATHA AVE |
| 8 | FERRY ST N & FERRY ST S & MAIN ST W |
| 9 | HIGHWAY 169 & DAYTON RD |
| 10 | HWY 51 & CR B |
| 11 | CSAH 42 & CSAH 5 |
| 12 | HIGHWAY 101 & DIAMOND LAKE RD S |
| 13 | TH 55 & VICKSBURG LN |
| 14 | CSAH 23 (CEDAR AVE) & 140TH ST |
| 15 | WASHINGTON & HIGHWAY 36 |
| 16 | CSAH 42 & NICOLLET AVE |
| 17 | TH 65 & 93RD LN |
| 18 | TH 7 & CSAH 101 |
| 19 | Cedar Ave & Dodd Blvd |
| 20 | Cedar Ave & 153rd |

# Top 20 Intersections Peak Period Delay

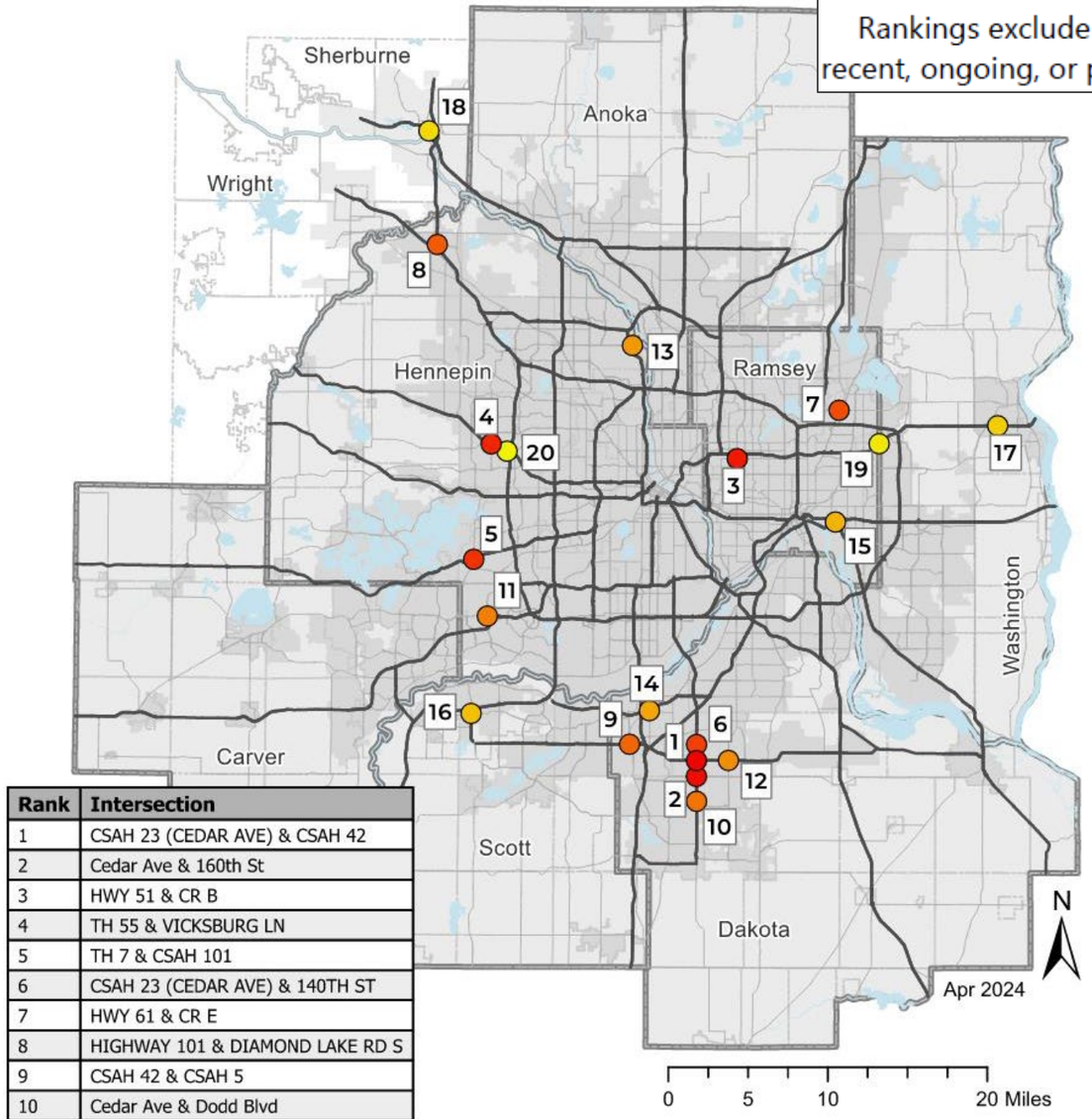
Rankings exclude intersections with recent, ongoing, or programmed projects.




| Rank | Intersection |
|---|---|
| 1 | 32ND ST E & HIAWATHA AVE |
| 2 | 38TH ST E & HIAWATHA AVE |
| 3 | 37TH ST E & HIAWATHA AVE |
| 4 | 35TH ST E & HIAWATHA AVE |
| 5 | 33RD ST E & HIAWATHA AVE |
| 6 | HIGHWAY 169 & DAYTON RD |
| 7 | TH 169 (FERRY ST) & MAIN ST W |
| 8 | TH 13 & QUENTIN AVE |
| 9 | TH 65 & 93RD LN |
| 10 | CSAH 23 (CEDAR AVE) & CSAH 42 |
| 11 | TH 169 & WEST RIVER RD N |
| 12 | TH 13 & WASHBURN AVE |
| 13 | HIGHWAY 101 & DIAMOND LAKE RD S |
| 14 | TH 169 & HAYDEN LAKE RD E |
| 15 | Cedar Ave & 160th St |
| 16 | CSAH 23 (CEDAR AVE) & 145TH ST |
| 17 | 150TH ST W & FLAGSTAFF AVE |
| 18 | CSAH 42 & CSAH 5 |
| 19 | TH 13 & CHOWEN AVE |
| 20 | TH 169 & 117TH AVE N |

# Top 20 Intersections Cross Street Delay

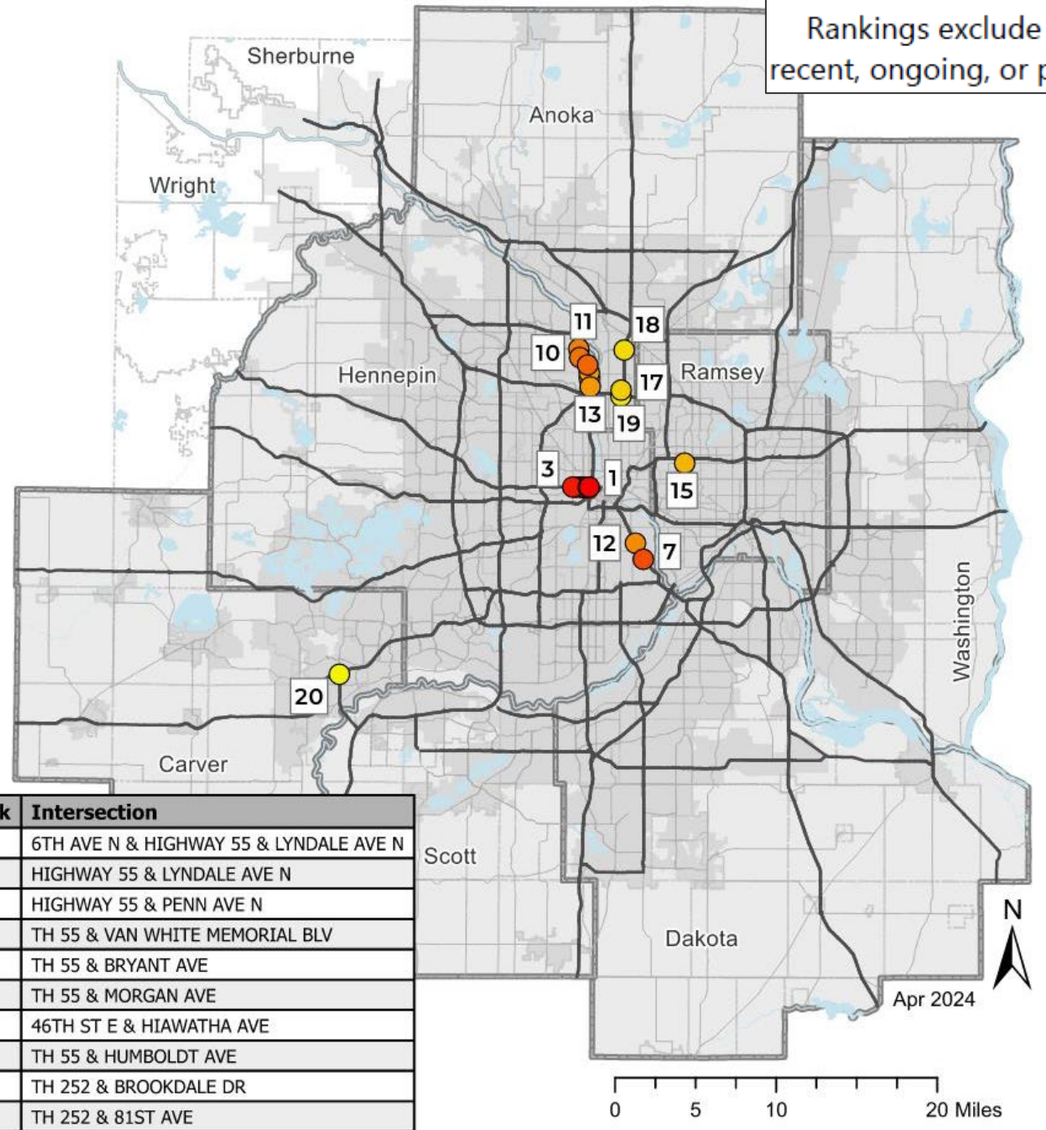
Rankings exclude intersections with recent, ongoing, or programmed projects.




| Rank | Intersection |
|---|---|
| 1 | CSAH 23 (CEDAR AVE) & CSAH 42 |
| 2 | Cedar Ave & 160th St |
| 3 | HWY 51 & CR B |
| 4 | TH 55 & VICKSBURG LN |
| 5 | TH 7 & CSAH 101 |
| 6 | CSAH 23 (CEDAR AVE) & 140TH ST |
| 7 | HWY 61 & CR E |
| 8 | HIGHWAY 101 & DIAMOND LAKE RD S |
| 9 | CSAH 42 & CSAH 5 |
| 10 | Cedar Ave & Dodd Blvd |
| 11 | HWY 5 & CSAH 4 |
| 12 | CSAH 42 & PILOT KNOB RD |
| 13 | TH 252 & 85TH AVE |
| 14 | TH 13 & NICOLLET AVE |
| 15 | TH 61 & BURNS AVE |
| 16 | CSAH 17 & 17th Ave E |
| 17 | WASHINGTON & HIGHWAY 36 |
| 18 | HIGHWAY 10 & MAIN ST |
| 19 | TH 36 & TH 120 (CENTURY AVE) |
| 20 | TH 55 & FERNBROOK LN |

# Top 20 Intersections Transit Passenger Delay

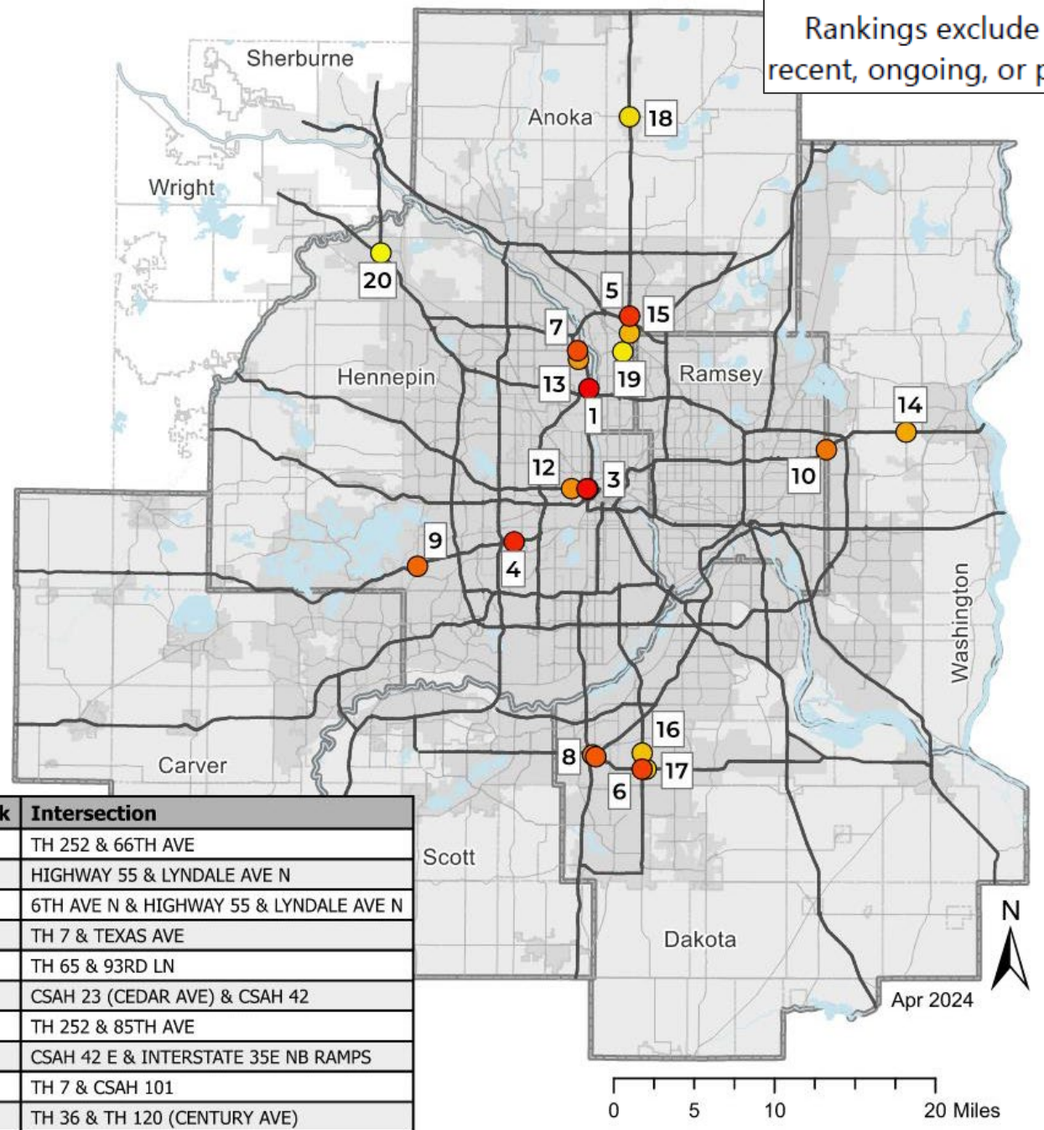
Rankings exclude intersections with recent, ongoing, or programmed projects.




| Rank | Intersection |
|---|---|
| 1 | 6TH AVE N & HIGHWAY 55 & LYNDALE AVE N |
| 2 | HIGHWAY 55 & LYNDALE AVE N |
| 3 | HIGHWAY 55 & PENN AVE N |
| 4 | TH 55 & VAN WHITE MEMORIAL BLV |
| 5 | TH 55 & BRYANT AVE |
| 6 | TH 55 & MORGAN AVE |
| 7 | 46TH ST E & HIAWATHA AVE |
| 8 | TH 55 & HUMBOLDT AVE |
| 9 | TH 252 & BROOKDALE DR |
| 10 | TH 252 & 81ST AVE |
| 11 | TH 252 & 85TH AVE |
| 12 | 38TH ST E & HIAWATHA AVE |
| 13 | TH 252 & 66TH AVE |
| 14 | TH 252 & 73RD AVE |
| 15 | HWY 51 & CR B |
| 16 | TH 252 & 70TH AVE |
| 17 | TH 65 & MEDTRONIC PKWY |
| 18 | TH 65 NE & OSBORNE RD |
| 19 | HWY 65 & I-694 SOUTH RAMPS |
| 20 | CHESTNUT ST N & HIGHWAY 212 |

# Top 20 Intersections Total Crash Cost

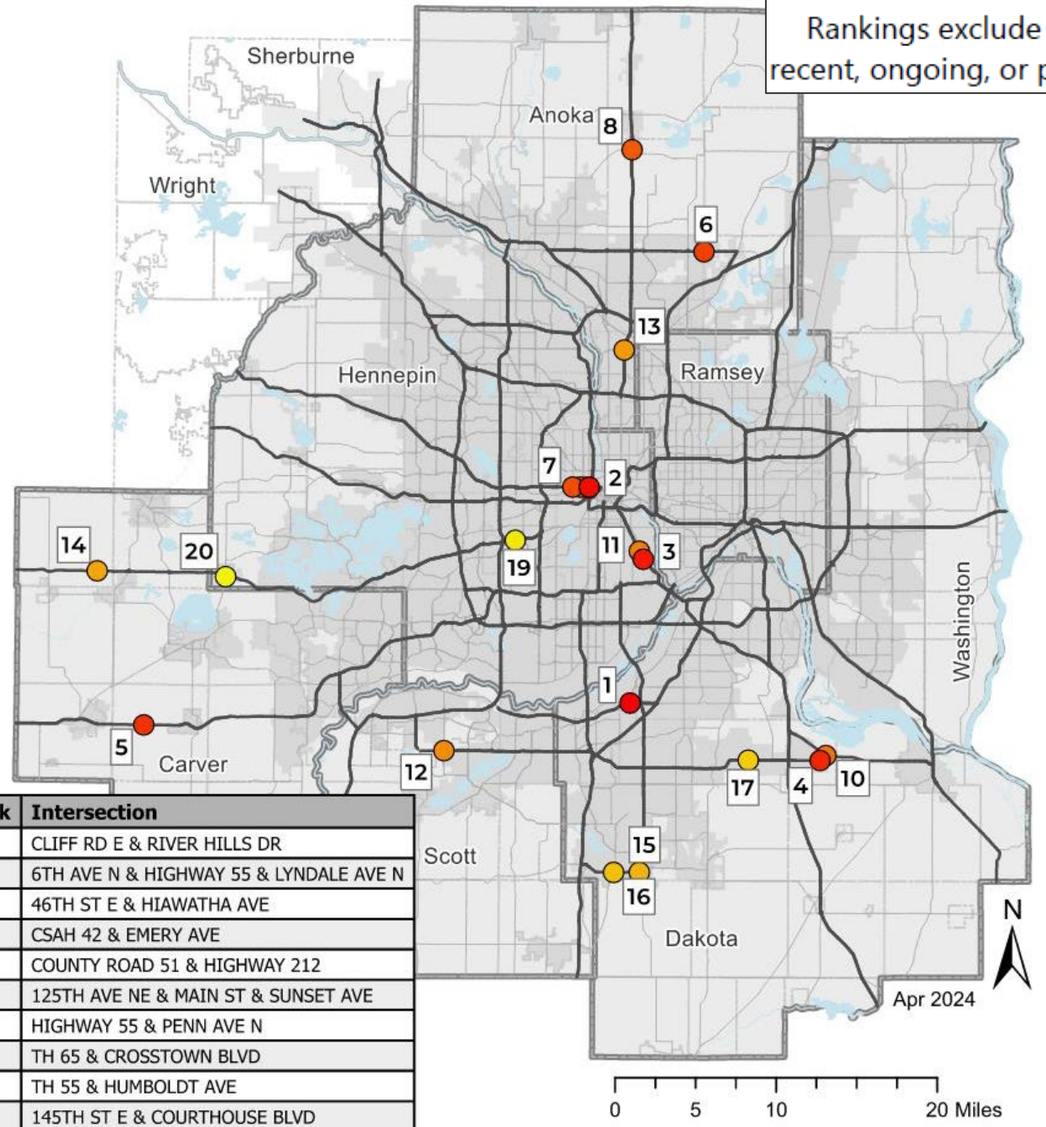
Rankings exclude intersections with recent, ongoing, or programmed projects.




| Rank | Intersection |
|---|---|
| 1 | TH 252 & 66TH AVE |
| 2 | HIGHWAY 55 & LYNDALE AVE N |
| 3 | 6TH AVE N & HIGHWAY 55 & LYNDALE AVE N |
| 4 | TH 7 & TEXAS AVE |
| 5 | TH 65 & 93RD LN |
| 6 | CSAH 23 (CEDAR AVE) & CSAH 42 |
| 7 | TH 252 & 85TH AVE |
| 8 | CSAH 42 E & INTERSTATE 35E NB RAMPS |
| 9 | TH 7 & CSAH 101 |
| 10 | TH 36 & TH 120 (CENTURY AVE) |
| 11 | CSAH 42 & NICOLLET AVE |
| 12 | HIGHWAY 55 & PENN AVE N |
| 13 | TH 252 & 81ST AVE |
| 14 | TH 36 & LAKE ELMO AVE N |
| 15 | TH 65 NE & LINCOLN ST |
| 16 | CSAH 23 (CEDAR AVE) & 140TH ST |
| 17 | 150TH ST W & GARRETT AVE |
| 18 | TH 65 & VIKING BLVD |
| 19 | TH 65 NE & OSBORNE RD |
| 20 | TH 101 / I-94 North Ramp |

# Top 20 Intersections Severe Crash Rate

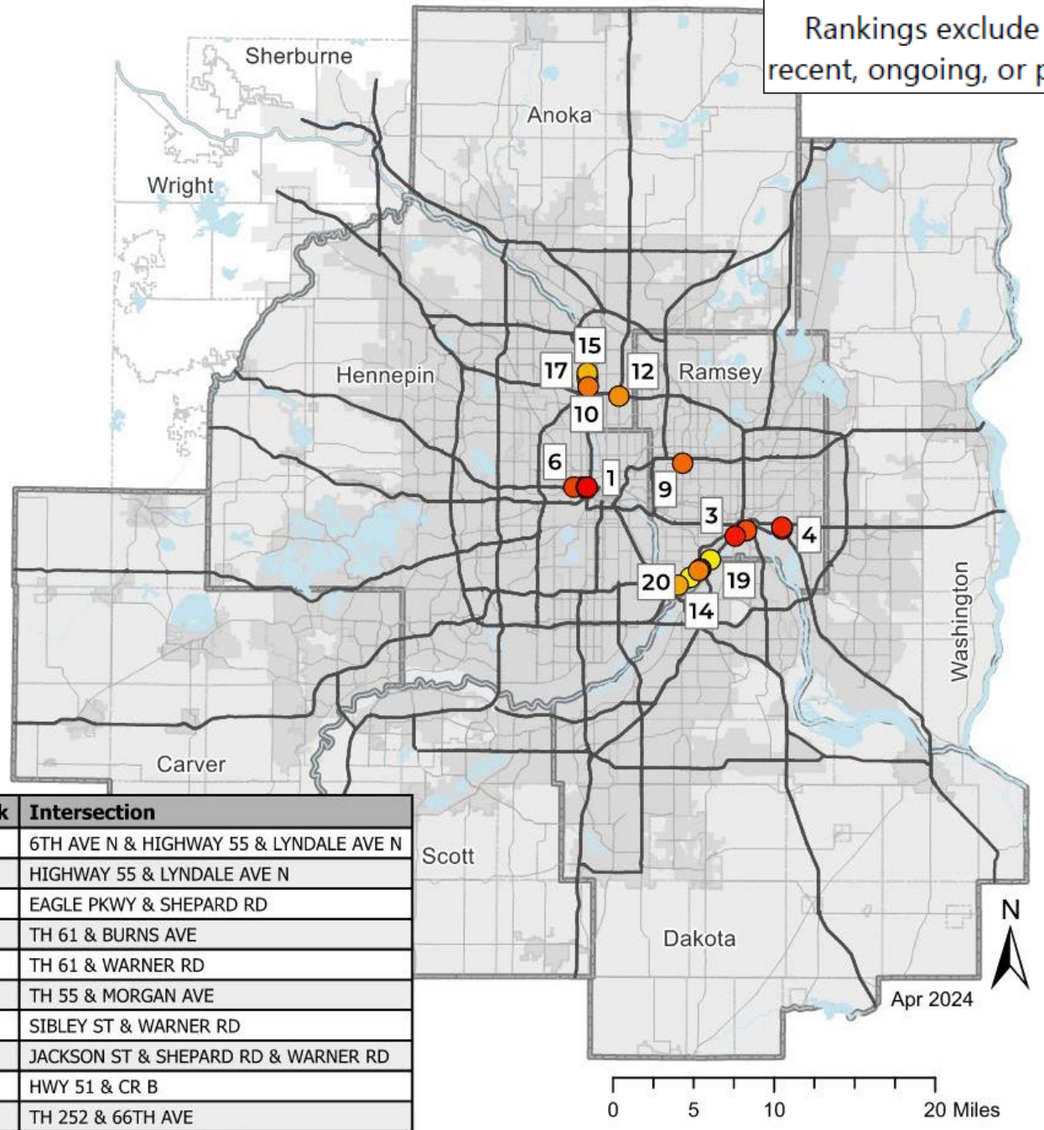
Rankings exclude intersections with recent, ongoing, or programmed projects.




| Rank | Intersection |
|---|---|
| 1 | CLIFF RD E & RIVER HILLS DR |
| 2 | 6TH AVE N & HIGHWAY 55 & LYNDALE AVE N |
| 3 | 46TH ST E & HIAWATHA AVE |
| 4 | CSAH 42 & EMERY AVE |
| 5 | COUNTY ROAD 51 & HIGHWAY 212 |
| 6 | 125TH AVE NE & MAIN ST & SUNSET AVE |
| 7 | HIGHWAY 55 & PENN AVE N |
| 8 | TH 65 & CROSSTOWN BLVD |
| 9 | TH 55 & HUMBOLDT AVE |
| 10 | 145TH ST E & COURTHOUSE BLVD |
| 11 | 42ND ST E & HIAWATHA AVE |
| 12 | CSAH 42 & CSAH 83 |
| 13 | TH 65 NE & OSBORNE RD |
| 14 | HWY 7 & TACOMA AVE |
| 15 | 215th St W & Grenada Ave |
| 16 | 215th St W & Dodd Blvd |
| 17 | 145TH ST E & 145TH ST W & AKRON AVE |
| 18 | HIGHWAY 55 & LYNDALE AVE N |
| 19 | TH 7 & TEXAS AVE |
| 20 | HIGHWAY 7 & MAIN ST |

# Top 20 Intersections SPACE Score

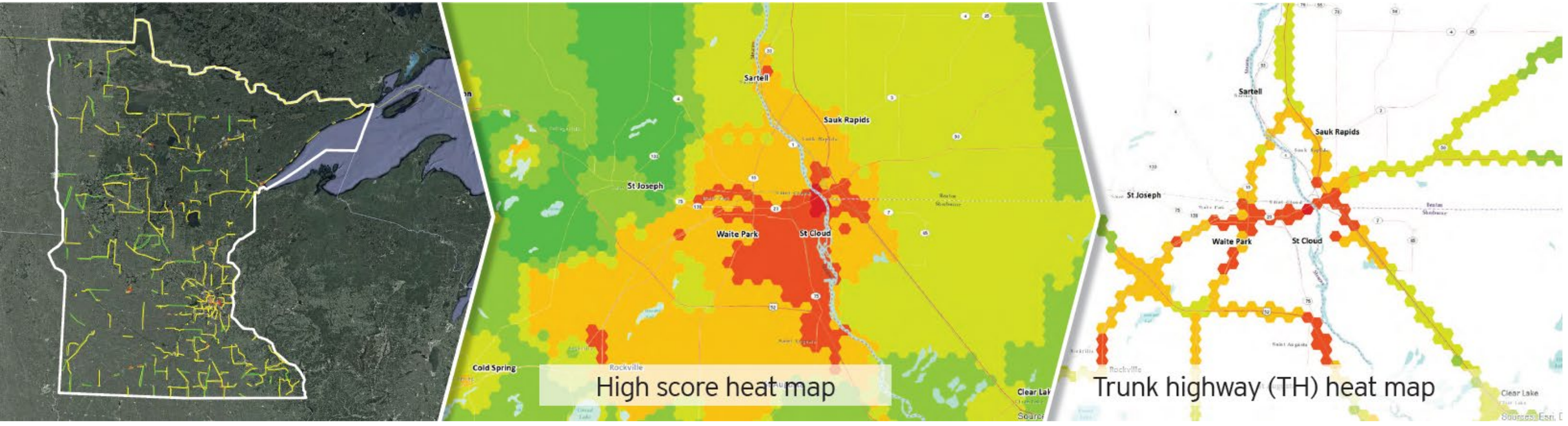
Rankings exclude intersections with recent, ongoing, or programmed projects.




| Rank | Intersection |
|---|---|
| 1 | 6TH AVE N & HIGHWAY 55 & LYNDALE AVE N |
| 2 | HIGHWAY 55 & LYNDALE AVE N |
| 3 | EAGLE PKWY & SHEPARD RD |
| 4 | TH 61 & BURNS AVE |
| 5 | TH 61 & WARNER RD |
| 6 | TH 55 & MORGAN AVE |
| 7 | SIBLEY ST & WARNER RD |
| 8 | JACKSON ST & SHEPARD RD & WARNER RD |
| 9 | HWY 51 & CR B |
| 10 | TH 252 & 66TH AVE |
| 11 | SHEPARD RD & ELWAY ST |
| 12 | HWY 65 & I-694 SOUTH RAMPS |
| 13 | I-35E SB RAMP & SHEPARD RD |
| 14 | SHEPARD RD & DAVERN ST |
| 15 | TH 252 & 73RD AVE |
| 16 | TH 55 & VAN WHITE MEMORIAL BLV |
| 17 | TH 252 & 70TH AVE |
| 18 | I-35E NB RAMP & SHEPARD RD |
| 19 | OTTO AVE & SHEPARD RD |
| 20 | SHEPARD RD & RANKIN ST |

# SPACE Analysis Process

- SPACE estimates latent demand for all modes of Active Transportation
- Spatially assigned using hexagons approximately ½-mile across
- IMSS intersections were assigned a SPACE score of hexagon it is located within



# SPACE Score Definition

*Suitability of the Pedestrian and Cyclist Environment (SPACE)*

SPACE Score: 19 Factors are aggregated to an overall SPACE score on a 0-100 scale

| | Current Usage | Trip Generators |
|---|---|---|
| Priority Populations | Percent of population **AGE 5-17** > average | Percent of workers **COMMUTING 15 MIN** or less > average |
| | Percent of population **AGE 65+** > average | Percent of workers **COMMUTING BY TRANSIT** > 0% |
| | Percent of population **FOREIGN BORN** > average | Percent of workers **COMMUTING BY WALKING** > 0% |
| | Percent of population **NATIVE AMERICAN** > average | Percent of workers **COMMUTING BY BICYCLE** > 0% |
| | Percent of population with **DISABILITY** > average | Percent of workers with **NO ACCESS TO A VEHICLE** > 0% |
| E.J. | "Area of concern" by MPCA **ENVIRONMENTAL JUSTICE** | ≥ 25% population within half-mile of **SUPERMARKET** |
| | **UNEMPLOYMENT** rate ≥ average | Within 1-mile of K-12 **SCHOOL** |
| | Percent of population in **POVERTY IN URBAN** area ≥ 25% | Within 500 feet of **BUS STOP** |
| Risk | **HIGH RISK** trunk highway intersection for non-motorists | Within an **URBAN** area |
| | | Contains a state **BICYCLE TRAIL** |