Application

19838 - 2024 Roadway Modernization
20035 - CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project
Regional Solicitation - Roadways Including Multimodal Elements

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Primary Contact

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What Grant Programs are you most interested in? Regional Solicitation - Roadways Including Multimodal Elements

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.

Fax:
PeopleSoft Vendor Number 0000028004A9

Project Information

Project Name CSAH 152 (Cedar Ave) Phase 2 Reconstruction 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):

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

The proposed project includes the reconstruction of the CSAH 152 (Cedar Ave) corridor from 50' north of CSAH 42 (42nd St) to 50' south of CSAH 3 (Lake St) in the City of Minneapolis. The proposed project will follow Phase 1 improvements along CSAH 152 (Cedar Ave), which has project limits from approximately 150' south of CSAH 3 (Lake St) to 24th St.

CSAH 152 (Cedar Ave) is classified as an A-Minor Arterial that functions as an Augmenter. The current roadway consists of a 2-lane undivided configuration with limited turn lanes at key intersections, and parking. Crossing CSAH 152 (Cedar Ave) also serves as a barrier for people walking and rolling due to limited gaps in traffic and limited sight distance due to parked vehicles. Attachment 02 provides a map of the project location, and Attachment 03 includes photos of existing conditions.

The project objectives are to improve the accessibility, mobility, and safety for all modes. Metro Transit has identified this corridor as a future arterial bus rapid transit route in the 2030-2035 timeframe as part of their Network Next Study; and this proposed reconstruction project will improve first and last mile connections to transit for multimodal users. Improvements made as part of this reconstruction project are not anticipated to preclude future arterial bus rapid transit along this corridor.

This project will include, but is not limited to, the following elements. The specific locations and types of improvements will be determined as part of the design process based on additional community input, data analysis, and environmental review. The potential typical section for the corridor is included in Attachment 04 and the potential corridor concept is included in Attachment 05.

- Roadway improvements; such as the replacement of the deteriorated pavement, pavement substructure, curb and gutter, and storm sewer structures.

- Safety improvements; such as the upgrading of traffic signal systems to include dedicated left-turn phasing, the addition of turn lanes, the installation of curb extensions and/or raised medians that will reduce the crossing distance for people walking and rolling, and manage speeds for people driving.

- Pedestrian improvements; such as ADA compliant ramps and sidewalks, APS, high visibility crosswalk markings, crossing beacons, curb extensions, raised medians, and countdown timers.

- Streetscaping improvements; such as improved boulevard space and lighting. Additionally, as part of the design process, staff will evaluate the potential for burying overhead utilities and the removal of on-street parking in order to provide additional space for streetscaping.

(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.

CSAH 152 (Cedar Ave) from 50' N of CSAH 42 (42nd St) to 50' S of CSAH 3 (Lake St) in Minneapolis.

Include both the CSAH/MSAS/TH references and their corresponding street names in the TIP Description (see Resources link on Regional Solicitation webpage for examples).

Project Length (Miles)

1.47

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	$7,000,000.00
Match Amount *Minimum of 20% of project total*	$8,140,000.00
Project Total *For transit projects, the total cost for the application is total cost minus fare revenues.*	$15,140,000.00
Match Percentage *Minimum of 20%* *Compute the match percentage by dividing the match amount by the project total*	53.76%
Source of Match Funds *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*	Hennepin County
Preferred Program Year	
Select one: *Select 2026 or 2027 for TDM and Unique projects only. For all other applications, select 2028 or 2029.*	2028
Additional Program Years: *Select all years that are feasible if funding in an earlier year becomes available.*	

Project Information-Roadways

NOTE: If your project has already been assigned a State Aid Project # (SAP or SP), please Indicate SAP# here

SAP#:

County, City, or Lead Agency	Hennepin County
Functional Class of Road	A-Minor Arterial (Augmenter)
Road System *TH, CSAH, MSAS, CO. RD., TWP. RD., CITY STREET*	CSAH
Road/Route No. *i.e., 53 for CSAH 53*	152
Name of Road *Example; 1st ST., MAIN AVE*	Cedar Ave
TERMINI:(Termini listed must be within 0.3 miles of any work)	
From: **Road System**	CSAH
Road/Route No. *i.e., 53 for CSAH 53*	42
Name of Road *Example; 1st ST., MAIN AVE*	42nd St
To: **Road System** *DO NOT INCLUDE LEGAL DESCRIPTION*	CSAH
Road/Route No. *i.e., 53 for CSAH 53*	3
Name of Road *Example; 1st ST., MAIN AVE*	Lake St
In the City/Cities of: *(List all cities within project limits)*	Minneapolis
OR:	
At: **Road System** *(TH, CSAH, MSAS, CO. RD., TWP. RD., City Street)*	
Road/Route No. *i.e., 53 for CSAH 53*	
Name of Road *Example; 1st ST., MAIN AVE*	
In the City/Cities of: *(List all cities within project limits)*	
PROJECT LENGTH	
Miles *(nearest 0.1 miles)*	

Primary Types of Work (check all the apply)	
New Construction	
Reconstruction	Yes
Resurfacing	
Bituminous Pavement	Yes
Concrete Pavement	
Roundabout	
New Bridge	
Bridge Replacement	
Bridge Rehab	
New Signal	
Signal Replacement/Revision	Yes
Bike Trail	
Other (do not include incidental items)	GRADING, AGG BASE, BIT BASE & SURFACE, STORM SEWER, SIDEWALK, ADA, SIGNALS, STREETSCAPING, LIGHTING, AND CURB/GUTTER
BRIDGE/CULVERT PROJECTS (IF APPLICABLE)	
Old Bridge/Culvert No.:	
New Bridge/Culvert No.:	
Structure is Over/Under (Bridge or culvert name):	
OTHER INFORMATION:	
Zip Code where Majority of Work is Being Performed	55407
Approximate Begin Construction Date	05/01/2028
Approximate End Construction Date	10/31/2029
Miles of Trail (nearest 0.1 miles)	0
Miles of Sidewalk (nearest 0.1 miles)	3.0
Miles of trail on the Regional Bicycle Transportation Network (nearest 0.1 miles):	0
Is this a new trail?	No

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:

A) Transportation System Stewardship (p 2.2-2.4)

Objectives A & B; Strategies A1 & A2

The project is needed to reconstruct the roadway as maintenance is no longer an efficient strategy. Assets will be updated to a state of good repair with cost-effective improvements anticipated for people walking and rolling, as well as people driving.

B) Safety and security (p 2.5-2.9)

Objectives A & B; Strategies B1, B3, B4 & B6

The project will result in safer outcomes for all users along the roadway and at intersections, particularly for vulnerable users. Traffic calming strategies such as curb extensions, boulevards, and an enhanced crossing will reduce vehicle speeds, which can reduce crashes and crash severity.

C) Access to destinations (p 2.10-2.25)

Objectives A, B, C, D & E; Strategies C1, C2, C3, C4, C8, C9, C15, C16 & C17

As an A-minor Augmentor, CSAH 152 (Cedar Ave) provides a key north-south multimodal connection for people accessing residential, commercial and recreational destinations in south Minneapolis. This project will improve facilities for people walking and driving along the corridor and crossing intersections and will tie into the CSAH 152 (Cedar Ave) Phase 1 Reconstruction Project directly north of the project.

D) Competitive economy (p 2.26-2.29)

Objectives A, B & C; Strategies D1, D3 & D4

The project provides people with reliable access directly to employment, shopping and recreational destinations in south Minneapolis. The project enhances connectivity for all users to businesses on CSAH 152 (Cedar Ave) at the CSAH 42 (42nd St), 38th St, 36th St and CSAH 3 (Lake St) intersections.

E) Healthy and equitable communities (p 2.30-2.34)

Objectives A, B, C & D; Strategies E1, E2, E3, E4, E5, E6 & E7

Engagement is ongoing for the CSAH 152 (Cedar Ave) reconstruction project and is applicable to the proposed project. Engagement has identified project goals to make CSAH 152 (Cedar Ave) more comfortable for all, and implement features that improve livability. The project will add boulevards, separating pedestrians from motorists while adding green space. Curb extensions and refuge islands will make it safer for pedestrians to cross intersections.

F) Leveraging transportation investments to guide land use (p 2.35-2.41)

Objectives A & C; Strategies F1, F2, F3, F5, F6, F7

The project will enhance a north-south multimodal corridor in south Minneapolis. This project will make it safer for residents to access businesses at key intersections and increase walkability and livability of the area.

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: Unique projects are exempt from this qualifying requirement because of their innovative nature.

1) Hennepin County 2040 Transportation Plan (pages 2-11 - 2-18)

URL: hennepin.us/-/media/hennepinus/your-government/projects-initiatives/2040-comprehensive-plan/2040-comprehensive-plan-full.pdf

2) Hennepin County Climate Action Plan (pages 50-54)

URL: hennepin.us/climate-action/-/media/climate-action/hennepin-county-climate-action-plan-final.pdf

3) Hennepin County Complete and Green Streets Policy (pages 10-11)

URL: hennepin.us/-/media/hennepinus/your-government/projects-initiatives/complete-streets/Complete-and-Green-Streets-Policy_Oct2023.pdf

4) Hennepin County Pedestrian Plan (page 8)

URL: hennepin.us/-/media/hennepinus/residents/transportation/documents/pedestrian-plan.pdf

5) City of Minneapolis Vision Zero Action Plan (pages 16-35)

URL: lims.minneapolismn.gov/Download/RCAV2/31027/18-Vision-Zero-Action-Plan-2023-2025.pdf

6) City of Minneapolis Pedestrian Priority Network Map (page 47 (2 of 26))

URL: go.minneapolismn.gov/application/files/7316/0753/2056/TAP_Final_WALKING.pdf

7) Metro Transit Network Next

URL: metrotransit.org/Data/Sites/1/media/network-next/nn-corridor-profile-w-broadway-cedar.pdf

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. Unique project costs are limited to those that are federally eligible.

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

5. Applicant is a public agency (e.g., county, city, tribal government, transit provider, etc.) or non-profit organization (TDM and Unique Projects applicants only). 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 in Table 1. For unique projects, the minimum award is $500,000 and the maximum award is the total amount available each funding cycle (approximately $4,000,000 for the 2024 funding cycle).

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): *$500,000 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 future Regional Solicitation funding cycles, this requirement may include that the plan has undergone a recent update, e.g., within five years prior to application.

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

(TDM and Unique Project Applicants Only) The applicant is not a public agency subject to the self-evaluation requirements in Title II of the ADA.

Date plan completed: 08/31/2015

Link to plan: 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. This includes assurance of year-round use of bicycle, pedestrian, and transit facilities, per FHWA direction established 8/27/2008 and updated 4/15/2019. Unique projects are exempt from this qualifying requirement.

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 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. Bridge Rehabilitation/Replacement projects must be located on a minor collector and above functionally classified roadway in the urban areas or a major collector and above in the rural areas.

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

Roadway Strategic Capacity 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 MnDOT?s ?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 in-place structure is 20 feet or longer.

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

6. The bridge must have a Local Planning Index (LPI) of less than 60 OR a National Bridge Inventory (NBI) Rating of 3 or less for either Deck Geometry, Approach Roadway, or Waterway Adequacy as reported on the most recent Minnesota Structure Inventory Report.

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 David Elvin at MnDOT (David.Elvin@state.mn.us or 651-234-7795) 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.

Requirements - Roadways Including Multimodal Elements

Specific Roadway Elements

CONSTRUCTION PROJECT ELEMENTS/COST ESTIMATES	Cost
Mobilization (approx. 5% of total cost)	$597,000.00
Removals (approx. 5% of total cost)	$498,000.00
Roadway (grading, borrow, etc.)	$1,017,640.00
Roadway (aggregates and paving)	$2,133,290.00
Subgrade Correction (muck)	$0.00
Storm Sewer	$1,458,000.00
Ponds	$0.00
Concrete Items (curb & gutter, sidewalks, median barriers)	$525,800.00
Traffic Control	$597,000.00
Striping	$120,500.00
Signing	$65,800.00
Lighting	$0.00
Turf - Erosion & Landscaping	$486,000.00
Bridge	$0.00
Retaining Walls	$0.00
Noise Wall (not calculated in cost effectiveness measure)	$0.00
Traffic Signals	$1,530,000.00
Wetland Mitigation	$0.00
Other Natural and Cultural Resource Protection	$0.00
RR Crossing	$0.00
Roadway Contingencies	$2,707,500.00
Other Roadway Elements	$0.00
Totals	**$11,736,530.00**

Specific Bicycle and Pedestrian Elements

CONSTRUCTION PROJECT ELEMENTS/COST ESTIMATES	Cost
Path/Trail Construction	$0.00
Sidewalk Construction	$963,050.00
On-Street Bicycle Facility Construction	$0.00
Right-of-Way	$0.00
Pedestrian Curb Ramps (ADA)	$220,000.00
Crossing Aids (e.g., Audible Pedestrian Signals, HAWK)	$221,000.00
Pedestrian-scale Lighting	$588,000.00
Streetscaping	$486,000.00
Wayfinding	$0.00
Bicycle and Pedestrian Contingencies	$785,420.00
Other Bicycle and Pedestrian Elements	$140,000.00
Totals	**$3,403,470.00**

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

PROTECT Funds Eligibility

One of the new federal funding sources is Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (PROTECT). Please describe which specific elements of your project and associated costs out of the Total TAB-Eligible Costs are eligible to receive PROTECT funds. Examples of potential eligible items may include: storm sewer, ponding, erosion control/landscaping, retaining walls, new bridges over floodplains, and road realignments out of floodplains.

INFORMATION: Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (PROTECT) Formula Program Implementation Guidance (dot.gov).

Response:	Based on a planning level review of the proposed scope of work, the following project elements appear to be eligible for the PROTECT Program: Storm Sewer, Landscaping, and Streetscaping (within the Bicycle and Pedestrian Elements)

Totals

Total Cost	$15,140,000.00
Construction Cost Total	$15,140,000.00
Transit Operating Cost Total	$0.00

Measure B: Project Location Relative to Jobs, Manufacturing, and Education

Existing Employment within 1 Mile:	16756
Existing Manufacturing/Distribution-Related Employment within 1 Mile:	2341
Existing Post-Secondary Students within 1 Mile:	0
Upload Map	1702044788449_2024 RS Map 02 - CSAH 152 Cedar Ave Phase 2 - Regional Economy.pdf

Please upload attachment in PDF form

Measure C: Current Heavy Commercial Traffic

RESPONSE: Select one for your project, based on the updated 2021 Regional Truck Corridor Study:

Along Tier 1:	
Miles:	0
(to the nearest 0.1 miles)	
Along Tier 2:	
Miles:	0
(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: Current Daily Person Throughput

Location	CSAH 152 (Cedar Ave) between E 31st St and E 36th St (Seq ID # 69537)
Current AADT Volume	15900
Existing Transit Routes on the Project	14, 21, 22, 23, 46

For New Roadways only, list transit routes that will likely be diverted to the new proposed roadway (if applicable).

Upload Transit Connections Map	1702045225233_2024 RS Map 04 - CSAH 152 Cedar Ave Phase 2 - Transit Connections.pdf

Please upload attachment in PDF form

Response: Current Daily Person Throughput

Average Annual Daily Transit Ridership	0
Current Daily Person Throughput	20670.0

Measure B: 2040 Forecast ADT

Use Metropolitan Council model to determine forecast (2040) ADT volume	Yes
If checked, METC Staff will provide Forecast (2040) ADT volume	
OR	
Identify the approved county or city travel demand model to determine forecast (2040) ADT volume	
Forecast (2040) ADT volume	

Measure A: Engagement

i. Describe any Black, Indigenous, and People of Color populations, low-income populations, disabled populations, youth, or older adults within a ½ mile of the proposed project. Describe how these populations relate to regional context. Location of affordable housing will be addressed in Measure C.

ii. Describe how Black, Indigenous, and People of Color populations, low-income populations, persons with disabilities, youth, older adults, and residents in affordable housing were engaged, whether through community planning efforts, project needs identification, or during the project development process.

iii. Describe the progression of engagement activities in this project. A full response should answer these questions:

1. *What engagement methods and tools were used?*
2. *How did you engage specific communities and populations likely to be directly impacted by the project?*
3. *What techniques did you use to reach populations traditionally not involved in community engagement related to transportation projects?*
4. *How were the project?s purpose and need identified?*
5. *How was the community engaged as the project was developed and designed?*
6. *How did you provide multiple opportunities for of Black, Indigenous, and People of Color populations, low-income populations, persons with disabilities, youth, older adults, and residents in affordable housing to engage at different points of project development?*
7. *How did engagement influence the project plans or recommendations? How did you share back findings with community and re-engage to assess responsiveness of these changes?*
8. *If applicable, how will NEPA or Title VI regulations will guide engagement activities?*

Response:

Within 0.5 miles of the project corridor, 45% of the population are Black, Indigenous, or People of Color (BIPOC) and 9% of the population has a disability of any kind. In addition, 26% are under the age of 18 and 9% of the population is over the age of 65. 29% of the population within 0.5 miles of the project area has a household income under 200% of the federal poverty level. 8% of the population of the project area has limited English proficiency. These demographic profiles are from the 2017 - 2021 5-year ACS estimates.

While formal public engagement has not started for the CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project, engagement is ongoing for the first phase of the reconstruction north of CSAH 3 (Lake St). Public engagement for the first phase has been iterative, utilizing a variety of open houses and focus groups at neighborhood businesses, organizations and community centers to ensure feedback from the most vulnerable corridor users. Surveys were also used, as well as pop-up engagement at events such as Open Streets. Project goals were and specific complete streets measures are being developed from the feedback heard from all corridor users, but particularly BIPOC populations, low-income populations, youth and older adults as well as those with disabilities. Materials were presented in both English and Spanish to ensure participation by the significant immigrant population from Central and South America which centers around CSAH 3 (Lake St). Attachment 06 includes a summary of community engagement to date.

Formal engagement for this project will follow a similar iterative process, utilizing a suite of strategies including but not limited to focus groups, open houses, online and paper surveys, and physical signage. Hennepin County will work directly with residents, community organizations, and members of underrepresented groups as project purpose and design is refined.

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

Measure B: Disadvantaged Communities Benefits and Impacts

Describe the project?s benefits to Black, Indigenous, and People of Color populations, low-income populations, children, people with disabilities, youth, and older adults. 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.

This is not an exhaustive list. A full response will support the benefits claimed, identify benefits specific to Disadvantaged communities residing or engaged in activities near the project area, identify benefits addressing a transportation issue affecting Disadvantaged communities specifically identified through engagement, and substantiate benefits with data.

Acknowledge and describe any negative project impacts to Black, Indigenous, and People of Color populations, low-income populations, children, people with disabilities, youth, and older adults. Describe measures to mitigate these impacts. Unidentified or unmitigated negative impacts may result in a reduction in points.

Below is a list of potential negative impacts. This is not an exhaustive list.

? Decreased pedestrian access through sidewalk removal / narrowing, placement of barriers along the walking path, increase in auto-oriented curb cuts, 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.

Response:

The project will benefit BIPOC populations, low-income populations, children, people with disabilities, youth, and older adults. The reconstruction of CSAH 152 (Cedar Ave) will improve overall corridor safety and make crossing intersections more comfortable for all modes of transportation.

The current design of CSAH 152 (Cedar Ave) lacks complete streets design elements that provide adequate accessibility, mobility, and safety for people walking; especially those with limited mobility. Attachment 07 provides an overview of key community resources as well as census tracts with high scores of the CDC/ATSDR Social Vulnerability Index (SVI), a resource that uses census data to measure resilience to natural or human-caused disasters. A significant portion of the northern half of the project corridor is identified as having a high SVI score, indicating the community is more vulnerable than others as well as a potentially a higher number of users who walk, cycle, or utilize public transit.

The project will improve crossings for people walking and rolling along CSAH 152 (Cedar Ave) at both signalized and unsignalized intersections. Reconstructed sidewalk assets will address obstructions, introduce ADA compliant curb ramps and APS at traffic signals. Safety will be improved through the project as crossing enhancements such as curb extensions, pedestrian refuges, and high visibility crosswalks will be implemented as feasible. This is particularly important as a significant percentage of the corridor population are children under 18 and 29% of corridor households are low-income and are more likely to walk, roll, or utilize transit. The project will also improve connectivity by improving crossings for planned east/west bicycle facilities along 32nd St, 34th St, 38th St and existing facilities along 40th St where CSAH 152 (Cedar Ave) currently acts as a barrier.

The project will also improve first and last mile connection for existing transit service to Metro Transit Routes 22, 14 and 23 as well as leveraging other county investments along CSAH 3 (Lake St) through the future B Line service. This will provide direct benefits to disadvantaged populations, particularly low-income populations and immigrant populations in the vicinity of CSAH 3 (Lake St) who utilize public transit as their primary mode of transportation.

Increased noise and impacts to the roadway and sidewalks are anticipated during construction. The contractor will be required to follow temporary traffic control plans which specify detour routes for all people traveling through the corridor. Access to adjacent buildings will be critical, and staff will seek our opportunities to ensure that nearby businesses and services are not negatively impacted during construction.

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

Measure C: Affordable Housing Access

Describe any affordable housing developments?existing, under construction, or planned?within ½ mile of the proposed project. The applicant should note the number of existing subsidized units, which will be provided on the Socio-Economic Conditions map. Applicants can also describe other types of affordable housing (e.g., naturally-occurring affordable housing, manufactured housing) and under construction or planned affordable housing that is within a half mile of the project. If applicable, the applicant can provide self-generated PDF maps to support these additions. Applicants are encouraged to provide a self-generated PDF map describing how a project connects affordable housing residents to destinations (e.g., childcare, grocery stores, schools, places of worship).

Describe the project?s benefits to current and future affordable housing residents within ½ mile of the project. Benefits must relate to affordable housing residents. Examples may include:

- *? specific direct access improvements for residents*
- *? improved access to destinations such as jobs, school, health care or other;*
- *? new transportation services or modal options;*
- *? and/or community connection and cohesion improvements.*

This is not an exhaustive list. Since residents of affordable housing are more likely not to own a private vehicle, higher points will be provided to roadway projects that include other multimodal access improvements. A full response will support the benefits claimed, identify benefits specific to residents of affordable housing, identify benefits addressing a transportation issue affecting residents of affordable housing specifically identified through engagement, and substantiate benefits with data.

Response:

A total of 56 affordable subsidized housing developments are located within 0.5 miles of the project area, many of which specifically target serving those with disabilities, seniors, and families with children. Attachment 08 provides a map and full detail summary of these locations, including unit sizes and affordability limits based on area median incomes. As identified in the Met Council generated Socio Economic Conditions map, 2065 subsidized units exist in census tracts within 0.5 miles of the project. This includes several developments with at larger apartments designated for families such as the Blue Line Flats and the L&H Station (Phase I), both of which contain over 100 affordable units, as well as several developments serving vulnerable populations. One such development is Clare Midtown, an affordable housing development which is aimed to support services for people living with HIV/AIDS. Spirit on Lake is another unique development with 46 units and a focus on providing affordable housing to LGBT seniors. The proposed project would provide a direct benefit to residents of these affordable housing developments through the allocation of existing right of way to facilities for those walking, rolling, cycling, and using transit.

Complete streets elements introduced through the project will help provide safe routes to school for families and children living in affordable housing as South High School, Bancroft Elementary School and Folwell Community school are all within close proximity to CSAH 152 (Cedar Ave). Improved crossings for people walking and rolling through curb extensions, enhanced crosswalks and other proven safety methods also will also connect residents of affordable housing to Powderhorn Park, one of the largest neighborhood parks in South Minneapolis and known for the wide racial and socioeconomic diversity of the residents it serves. An overview of key destinations throughout the project area can be found in Attachment 07.

The project will benefit residents of affordable housing by improving cohesion with the greater transportation system. Enhancements to multimodal facilities will directly improve first/last mile transit connections for residents who depend on the existing Metro Transit Routes 22, 14, and 23 service and the future B Line Arterial BRT on CSAH 3 (Lake St). CSAH 152 (Cedar Ave) has also been identified as a future Arterial BRT corridor. Intersection improvements and traffic calming will compliment existing on-street bicycle facilities along 40th St, as well as accommodate future bicycle facilities which will provide an all ages and abilities at 38th St, 34th St and 32nd St. This will ensure that residents of affordable housing will have a full range of modal choices to access their daily needs.

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

Measure D: BONUS POINTS

Project is located in an Area of Concentrated Poverty:	
Project?s census tracts are above the regional average for population in poverty or population of color (Regional Environmental Justice Area):	Yes
Project located in a census tract that is below the regional average for population in poverty or populations of color (Regional Environmental Justice Area):	
Upload the ?Socio-Economic Conditions? map used for this measure.	1702045656612_2024 RS Map 03 - CSAH 152 Cedar Ave Phase 2 - Socio Economic Conditions.pdf

Measure A: Year of Roadway Construction

Year of Original Roadway Construction or Most Recent Reconstruction	Segment Length	Calculation	Calculation 2
1966	1.42	2791.72	1899.129
2006	0.05	100.3	68.231
	1	**2892**	**1967**

Total Project Length

Total Project Length (as entered in "Project Information" form) 1.47

Average Construction Year

Weighted Year 1967

Total Segment Length (Miles)

Total Segment Length 1.47

Measure B: Geometric, Structural, or Infrastructure Improvements

Improved roadway to better accommodate freight movements: Yes

Response:

Cedar Ave from 38th St to Lake St was originally constructed as a constrained 4-lane with a face-to-face width of 44'. Since its last reconstruction in the 1960s, three pavement overlays have been completed; however, they are no longer cost effective in extending the roadway's useful life. In 2020, due to poor pavement conditions, Cedar Ave from 38th St to Lake St was restriped as a 2-lane as the outside travel lanes were no longer suitable for supporting vehicle loads.

A StreetLight analysis estimates 1,750 daily commercial vehicles (Attachment 09).

The proposed pavement design will support estimated traffic loads and reduce the likelihood that goods are damaged during transport.

(Limit 700 characters; approximately 100 words)

Improved clear zones or sight lines: Yes

Response:

On-street parking areas along Cedar Ave, especially near intersections, present obstructions for users along local streets.

The proposed project is anticipated to introduce curb extensions to not only improve sight lines, but also to better define on-street parking areas. Also, as part of the project development process, the consolidation of on-street parking will be evaluated to allow for the reallocation of space for other purposes. In addition, enhanced pedestrian crossings will be considered at locations where unwarranted traffic signals are being evaluated for removal to ensure adequate visibility for crossing pedestrians (including 32nd St, 34th St, 36th St, and 40th St).

(Limit 700 characters; approximately 100 words)

Improved roadway geometrics: Yes

Response:

The existing roadway width along Cedar Ave is approximately 44' and generally lacks vertical design elements, with the exception of 40th St, to clearly define on-street parking areas, bus stops, and pedestrian crossing locations.

A full reconstruction will allow for the reallocation of space for people walking, using transit, biking, and driving. Curb extensions will be considered to reduce crossing distances and promote calming. Dedicated left-turn lanes will also be considered to reduce conflicts with turning vehicles and promote user predictability. In addition, lane shifts and tapers will satisfy industry standards to promote comfortable experiences for users travelling along Cedar Ave.

(Limit 700 characters; approximately 100 words)

Access management enhancements:

Yes

Response:

There are approximately 35 access points along Cedar Ave (including 24 driveways and 11 local streets) where all turning movements are permitted - with the exception of 40th St. These conditions present a relatively high potential for rear-end, left-turn, and right-angle crashes.

Left-turn lanes, especially at key intersections, will be considered in project development to better facilitate turning movements. Access management strategies (such as driveway consolidation and right-in/right-out restrictions) will be considered to improve pedestrian crossing experiences. In addition, curb extensions and medians will be designed properly to ensure proper access for people walking.

(Limit 700 characters; approximately 100 words)

Vertical/horizontal alignment improvements:

Yes

Response:

The existing vertical elevation of Cedar Ave is substantially lower than adjacent properties in many areas; requiring stairs and retaining walls to accommodate the topography. This presents accessibility challenges for people with limited mobility and undesirable public/private infrastructure that requires ongoing maintenance. Also, the lack of left-turn lanes presents uncomfortable experiences due to the absence of a positive off-set for queued vehicles.

Roadway grades within existing ROW will be adjusted to the extent possible to improve the transition from roadway infrastructure to adjacent properties. Also, boulevard areas will be properly designed to minimize unnecessary grade changes.

(Limit 700 characters; approximately 100 words)

Improved stormwater mitigation:

Yes

Response:

Few stormwater inlets exist along Cedar Ave; primarily relying on the city's stormwater network to collect and manage stormwater within the ROW for Cedar Ave. In addition, the area near Cedar Ave/38th St has been identified by MetCouncil's Flood Map Screening Tool as a location susceptible to flooding.

Staff will collaborate with the city, park board, and the Mississippi River WMO to explore BMPs to improve water quality and withstand desired flood events. If feasible, the elimination of retaining walls will allow for water to flow more naturally as originally intended. Green space will be maximized, including the preservation of mature trees, to promote the region's Climate Action goals.

(Limit 700 characters; approximately 100 words)

Signals/lighting upgrades: Yes

Response:

Left-turn operations primarily operate as permissive only at signalized intersections. In addition, some signals lack overhead mastarms and luminaires due to overhead utilities.

The project is anticipated to reduce ongoing operational and maintenance costs by removing four unwarranted signals at the 40th, 36th, 34th, and 32nd St intersections (contingent on project development). Also, the antiquated wood pole lights will be upgraded to current design standards to ensure proper visibility; especially for pedestrians. Lastly, conduit and communications will be coordinated with the city's ITS project along Cedar Ave that was awarded funding in the 2022 Regional Solicitation (SP 141-030-060).

(Limit 700 characters; approximately 100 words)

Other Improvements Yes

Response:

Metro Transit's Network Next Study identifies Route 22 as a potential BRT service candidate in the 2030s. This reconstruction project presents an opportunity to improve first/last mile connections to future BRT stations along Cedar Ave (metrotransit.org/Data/Sites/1/media/network-next/nn-corridor-profile-w-broadway-cedar.pdf).

The substitution of proven safety countermeasures at locations where unwarranted signals are removed will reduce unnecessary delay while still promoting safe pedestrian crossings.

Additionally, disturbances to mature trees along Cedar Ave will be minimized to preserve shade and promote the comfort of people walking and rolling.

(Limit 700 characters; approximately 100 words)

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 without the Project:	Total Peak Hour Delay by the Project:	Total Peak hour Delay Reduced by project	EXPLANATION of methodology used to calculate railroad crossing delay, if applicable.	Synchro or HCM Reports
13.0	12.0	1.0	1497	1496	19461.0	17952.0	1509.0	N/A	1702480128753_CSAH 152 Cedar Ave - Synchro Report for Congestion Reduction.pdf
8.0	10.0	-2	1346	1346	10768.0	13460.0	-2692	N/A	1702480147176_CSAH 152 Cedar Ave - Synchro Report for Congestion Reduction.pdf
4.0	2.0	2.0	1240	1240	4960.0	2480.0	2480.0	N/A	1702480166525_CSAH 152 Cedar Ave - Synchro Report for Congestion Reduction.pdf
14.0	14.0	0	1596	1596	22344.0	22344.0	0	N/A	1702480187630_CSAH 152 Cedar Ave - Synchro Report for Congestion Reduction.pdf
7.0	4.0	3.0	1281	1281	8967.0	5124.0	3843.0	N/A	1702480205047_CSAH 152 Cedar Ave - Synchro Report for Congestion Reduction.pdf
17.0	17.0	0	1614	1614	27438.0	27438.0	0	N/A	1702480236628_CSAH 152 Cedar Ave - Synchro Report for Congestion Reduction.pdf
						88798			

Vehicle Delay Reduced

Total Peak Hour Delay Reduced	Total Peak Hour Delay Reduced	Delay Reduced Total
93938.0	88798.0	5140.0

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):
2.08	2.03	0.05
1.71	1.54	0.17
1.19	1.01	0.18
2.01	2.01	0
1.54	1.34	0.2
3.44	3.44	0
12	**11**	**1**

Total

Total Emissions Reduced: 0.6

Upload Synchro Report 1702480346580_CSAH 152 Cedar Ave - Synchro Report for Emission Reduction.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: Roadway Projects that do not Include Railroad Grade-Separation Elements

Crash Modification Factor Used:

Attachment 10 includes a listing of the reported crashes along the project corridor during the 2020-2022 timeframe. Attachment 11 includes CMFs referenced as part of the B/C Analysis.

XX) Countermeasure: Crashes targeted (CMF ID, % reduction)

01) Remove unwarranted signal: All (CMF 00332, 25%)

02) Install signal mastarms: All (CMF 01420, 49%)

03) Change LT phasing from prot only to prot/perm: All (CMF 04140, 42%)

04) Install LT lanes at signalized intersection: All (CMF 07998, 12.4%)

05) Resurface pavement: RE, SS, LT, RA, OR, & HO (CMF 09300, 14.7%)

06) CRSP: Introduce curb extensions: Ped (CMF N/A, 40%)

07) Reduce on-street parking availability: Parked Vehicles (CMF N/A, 10%)

(Limit 700 Characters; approximately 100 words)

Rationale for Crash Modification Selected:

The Benefit/Cost Analysis evaluated the project corridor in 15 different sections (comprised of major intersections and segments) to target crash themes. Up to two (of the seven selected) CMFs were applied to each crash based on the reported crash type, along with the anticipated benefit provided by each safety countermeasure. A maximum of three CMFs were applied to each individual intersection or segment since the project corridor experiences diverse crash types among people walking, biking, and driving.

The expected service life for each improvement was entered as 20 years in the Benefit/Cost Worksheets based on service life information included in the 2024 Highway Safety Improvement Program guidelines.

The overall crash reduction expected from the project is 19% (based on a 81% crash modification factor). Approximately 19% (7 crashes) of the total number of reported crashes from the years 2020 to 2022 will be reduced annually through the implementation of proven safety countermeasures as part of this project.

(Limit 1400 Characters; approximately 200 words)

Project Benefit ($) from B/C Ratio	$10,961,128.00
Total Fatal (K) Crashes:	0
Total Serious Injury (A) Crashes:	4
Total Non-Motorized Fatal and Serious Injury Crashes:	1
Total Crashes:	109
Total Fatal (K) Crashes Reduced by Project:	0
Total Serious Injury (A) Crashes Reduced by Project:	1
Total Non-Motorized Fatal and Serious Injury Crashes Reduced by Project:	0
Total Crashes Reduced by Project:	20
Worksheet Attachment	1702478569112_152_Benefit_Cost_Worksheets.pdf

Please upload attachment in PDF form

Roadway projects that include railroad grade-separation elements:

Current AADT volume:	0
Average daily trains:	0
Crash Risk Exposure eliminated:	0

Measure B: Pedestrian Safety

Determine if these measures do not apply to your project. *Does the project match either of the following descriptions?*

If either of the items are checked yes, then ***score for entire pedestrian safety measure is zero****. Applicant does not need to respond to the sub-measures and can proceed to the next section.*

Project is primarily a freeway (or transitioning to a freeway) and does not provide safe and comfortable pedestrian facilities and crossings.	No
Existing location lacks any pedestrian facilities (e.g., sidewalks, marked crossings, wide shoulders in rural contexts) and project does not add pedestrian elements (e.g., reconstruction of a roadway without sidewalks, that doesn?t also add pedestrian crossings and sidewalk or sidepath on one or both sides).	No

SUB-MEASURE 1: Project-Based Pedestrian Safety Enhancements and Risk Elements

To receive maximum points in this category, pedestrian safety countermeasures selected for implementation in projects should be, to the greatest extent feasible, consistent with the countermeasure recommendations in the Regional Pedestrian Safety Action Plan and state and national best practices. Links to resources are provided on the Regional Solicitation Resources web page.

Please answer the following two questions with as much detail as possible based on the known attributes of the proposed design. If any aspect referenced in this section is not yet determined, describe the range of options being considered, to the greatest extent available. If there are project elements that may increase pedestrian risk, describe how these risks are being mitigated.

1. Describe how this project will address the safety needs of people crossing the street at signalized intersections, unsignalized intersections, midblock locations, and roundabouts.

Treatments and countermeasures should be well-matched to the roadway?s context (e.g., appropriate for the speed, volume, crossing distance, and other location attributes). Refer to the Regional Solicitation Resources web page for guidance links.

Response:

CSAH 152 (Cedar Ave), from 38th St to CSAH 3 (Lake St) was previously a 4-lane undivided roadway until 2020 when it was restriped to a 2-lane roadway as the pavement in the outside vehicle lanes was showing signs of advanced deterioration. The 4-lane to 2-lane conversion provided some near-term safety benefits for people walking, however, a full reconstruction is desirable to introduce complete streets best practices for people walking along and across CSAH 152 (Cedar Ave).

Signalized intersections

The project is anticipated to replace 3 of the 7 existing signalized intersections. Although contingent on the project development process, the planning level concept identifies approximately 12 high-visibility crosswalks, supplemented with stop bars, that may be feasible at signalized intersections. Also, the use of protected/permissive left-turn phasing, countdown timers, and APS will promote safe and comfortable crossings. In addition, this project will be coordinated with the City of Minneapolis' ITS Project that was awarded federal funds through the 2022 Regional Solicitation (SP 141-030-060) ensure that a reasonable balance of mobility and delay is experienced along the corridor. Also, lighting conditions at signalized intersections will be upgraded - it's anticipated that a minimum of 6 lighting davits will be installed based on the proposed intersection configuration. Additionally, the roadway width at signalized intersections is anticipated to generally remain unchanged (currently approximately 40' from curb to curb).

Unsignalized intersections

The project is anticipated to redesign each of the 8 unsignalized intersections to advance the county's Complete & Green Streets policy. Although contingent on the project development process, the planning level concept identifies approximately 28 curb extension, 1 raised median, 4 crossing beacons (likely RRFBs), and 14 high-visibility crossing markings that may be feasible at unsignalized intersections. Through the implementation of these design best practices, crossing distances are anticipated to be reduced by approximately 14' (from 40' to 26'). Furthermore, it's anticipated that approximately 16 lighting poles will be installed at unsignalized intersections to promote user safety and security.

Roundabout intersections

Although contingent on the project development process, no roundabouts are anticipated.

Midblock locations

The proposed project will aim to encourage pedestrian crossings at intersections, however, mid-block crossings are not anticipated to be prohibited via the installation of barriers. Although not shown on the concept, curb extensions at midblock locations will be considered during project development to repurpose space for additional permanent traffic calming.

(Limit 2,800 characters; approximately 400 words)

Is the distance in between signalized intersections increasing (e.g., removing a signal)?

Select one: Yes

If yes, describe what measures are being used to fill the gap between protected crossing opportunities for pedestrians (e.g., adding High-Intensity Activated Crosswalk beacons to help motorists yield and help pedestrians find a suitable gap for crossing, turning signal into a roundabout to slow motorist speed, etc.).

Response:

Although contingent on the project development process, it's anticipated that an alternative intersection control device may be selected at the following 4 intersections that are better suited for intersection activity: 40th St, 36th St, 34th St, and 32nd St. If the existing traffic signal systems are removed as part of the project, one or more proven safety countermeasures (raised medians, curb extensions, and/or crossing beacons) will be implemented to facilitate pedestrian crossings and support a Safe Systems approach. Curb extensions will prove especially beneficial as this project element also defines the start/end of on-street parking areas - increasing pedestrian sight distance at intersections. Also, an estimated 14' reduction in the pedestrian crossing distance is anticipated at these locations - suggesting that pedestrian exposure will be reduced by 4 seconds (based on 3.5 feet per second walking speed). Additionally, since it's anticipated that CSAH 152 (Cedar Ave) will operate as a 2-lane roadway, dual-threat crashes are not likely.

(Limit 1,400 characters; approximately 200 words)

Will your design increase the crossing distance or crossing time across any leg of an intersection? (e.g., by adding turn or through lanes, widening lanes, using a multi-phase crossing, prohibiting crossing on any leg of an intersection, pedestrian bridge requiring length detour, etc.). This does not include any increases to crossing distances solely due to the addition of bike lanes (i.e., no other through or turn lanes being added or widened).

Select one: No

If yes,
? How many intersections will likely be affected?

Response: 0

? Describe what measures are being used to reduce exposure and delay for pedestrians (e.g., median crossing islands, curb bulb-outs, etc.)

Response:

Although contingent on the project development process, the planning level concept suggests the following changes to pedestrian crossing distances along the project corridor:

Signalized intersections (38th St, 35th St, & 31st St) - Crossing distances are anticipated to remain generally the same at approximately 40'.

Non-signalized intersections (41st St, 40th St, 39th St, 37th St, 36th St, 34th St, 33rd St, & 32nd St) - Crossing distances are anticipated to be reduced by approximately 14' from 40' to 26'.

Additionally, the planning level concept identifies approximately 28 curb extensions, 1 raised median, 4 crossing beacons, and 26 high visibility crosswalk markings that may be feasible as part of the CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project.

(Limit 1,400 characters; approximately 200 words)

? If grade separated pedestrian crossings are being added and increasing crossing time, describe any features that are included that will reduce the detour required of pedestrians and make the separated crossing a more appealing option (e.g., shallow tunnel that doesn?t require much elevation change instead of pedestrian bridge with numerous switchbacks).

Response:

Although contingent on the project development process, no new grade separated pedestrian crossings are anticipated to be introduced as part of the CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project.

(Limit 1,400 characters; approximately 200 words)

If mid-block crossings are restricted or blocked, explain why this is necessary and how pedestrian crossing needs and safety are supported in other ways (e.g., nearest protected or enhanced crossing opportunity).

Response:

Although contingent on the project development process, no mid-block crossings are anticipated to be prohibited as part of the CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project.

In addition, in recognition of the relatively long distance between blocks along CSAH 152 (Cedar Ave), approximately 660', midblock curb extensions will likely be considered as part of the design process to provide additional traffic calming along the corridor. Examples of this design strategy may be found along CSAH 22 (Lyndale Ave) for the segment extending from Minnehaha Pkwy to 38th St in South Minneapolis.

(Limit 1,400 characters; approximately 200 words)

2. Describe how motorist speed will be managed in the project design, both for through traffic and turning movements. *Describe any project-related factors that may affect speed directly or indirectly, even if speed is not the intended outcome (e.g., wider lanes and turning radii to facilitate freight movements, adding turn lanes to alleviate peak hour congestion, etc.). Note any strategies or treatments being considered that are intended to help motorists drive slower (e.g., visual narrowing, narrow lanes, truck aprons to mitigate wide turning radii, etc.) or protect pedestrians if increasing motorist speed (e.g., buffers or other separation from moving vehicles, crossing treatments appropriate for higher speed roadways, etc.).*

Response:

The CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project will introduce several proven design strategies to promote uniform, safe, and reasonable speeds by driving along the corridor.

Roadway operation changes

It's anticipated that on-street parking will be evaluated as part of the project development process to determined the appropriate accommodations (both sides, one side, or prohibited altogether). Although on-street parking creates the potential for rear-end and sideswipe related crashes, parked cars occupy space within the curb lines and assist in managing vehicle speeds along the corridor. Consideration will also be given to existing transit stops for Route 22 along CSAH 152 (Cedar Ave) to discourage improper behaviors by people driving during bus boarding/unloading procedures. This is especially important as Route 22 has been identified as a potential BRT candidate as part of Metro Transit's Network Next.

Roadway design changes

The project development process will determined the recommended roadway configuration along CSAH 152 (Cedar Ave) - which is anticipated to be a 2-lane or 3-lane roadway based on a review of the corridor activity. It's anticipated that dedicated left-turn lanes will be retained at key intersections to minimize weaving maneuvers by people driving whenever they encounter stopped vehicles who are waiting to complete their turn. Specific lane widths will be determined based on stakeholder input, data analysis, and environmental review to maintain a balance of mobility and safety along the corridor. Vertical design elements, such as curb extensions and raised medians, will be leveraged to provide visual cues to people driving and promote traffic calming. In addition, the crossing distance at unsignalized intersections is anticipated to be reduced by approximately 14' (from 40' to 26') minimize crossing exposure and reduce the likelihood of a pedestrian related crash.

Green streets changes

Mature trees currently exist within the boulevards along CSAH 152 (Cedar Ave). This project will aim to preserve as many trees as feasible to retain these assets that provide traffic calming and quality of life benefits. In addition, greening will be considered within the curb extensions to reduce impervious surfaces and improve stormwater management within the project area.

Multimodal facility changes

The existing sidewalk facilities are not anticipated to be changed significantly by the project. The introduction of curb extensions at unsignalized intersections will allow for the construction of directional pedestrian ramps that provide accessibility benefits for people with disabilities.

(Limit 2,800 characters; approximately 400 words)

If known, what are the existing and proposed design, operation, and posted speeds? Is this an increase or decrease from existing conditions?

Response:

The existing posted speed limit along CSAH 152 (Cedar Ave) is 30 mph.

The proposed design speed limit(s) will be determined as part of the project development process based on data analysis, stakeholder input, and environmental review. At this time, an increase in the existing speed limit is not anticipated. Project elements such as raised medians, curb extensions, and streetscaping (specially the retention of mature trees) will support the proposed design speed limit(s).

(Limit 1,400 characters; approximately 200 words)

SUB-MEASURE 2: Existing Location-Based Pedestrian Safety Risk Factors

These factors are based on based on trends and patterns observed in pedestrian crash analysis done for the Regional Pedestrian Safety Action Plan. Check off how many of the following factors are present. Applicants receive more points if more risk factors are present.

Existing road configuration is a One-way, 3+ through lanes	
or	
Existing road configuration is a Two-way, 4+ through lanes	
Existing road has a design speed, posted speed limit, or speed study/data showing 85th percentile travel speeds in excess of 30 MPH or more	Yes
Existing road has AADT of greater than 15,000 vehicles per day	Yes
List the AADT	15900

SUB-MEASURE 3: Existing Location-Based Pedestrian Safety Exposure Factors

These factors are based on based on trends and patterns observed in pedestrian crash analysis done for the Regional Pedestrian Safety Action Plan. Check off how many of the following existing location exposure factors are present. Applicants receive more points if more risk factors are present.

Existing road has transit running on or across it with 1+ transit stops in the project area (If flag-stop route with no fixed stops, then 1+ locations in the project area where roadside stops are allowed. Do not count portions of transit routes with no stops, such as non-stop freeway sections of express or limited-stop routes.)	Yes
Existing road has high-frequency transit running on or across it and 1+ high-frequency stops in the project area (high-frequency defined as service at least every 15 minutes from 6am to 7pm weekdays and 9am to 6pm Saturdays.)	
Existing road is within 500? of 1+ shopping, dining, or entertainment destinations (e.g., grocery store, restaurant)	Yes
If checked, please describe:	

The following transit routes currently operate along or across CSAH 152 (Cedar Ave) through the project area:

-Route 022 (6 stops in project area)

-Route 023 (2 stops in project area)

-Route 014 (8 stops in project area)

In addition, the future B Line service has a proposed stop directly north of the proposed project along CSAH 3 (Lake St), which will generate significant pedestrian activity.

CSAH 152 (Cedar Ave) is home to a number of neighborhood commercial notes providing shopping, dining and entertainment options including at CSAH 3 (Lake St), 35th St, 38th St, and 42nd St. Below is an abbreviated summary of key commercial destinations within 500' of the proposed project:

-Alborada Market (Latin American Groceries & Dining)

-City Market (Halal Groceries)

-Supermercado La Morentina (Latin American Groceries)

-Taqueria El Primo (Dining)

-Matt's Bar & Grill (Dining & Tourist Destination)

-Lucy's Market & Carry-Out Ethiopian Restaurant (Dining)

-Hamberguesas El Gordo (Dining)

-Southside Vintage & Quality Goods (Shopping)

-Everett's Foods & Meats (Grocery)

-Cedar Inn (Dining/Bar)

(Limit 1,400 characters; approximately 200 words)

Existing road is within 500? of other known pedestrian generators (e.g., school, civic/community center, senior housing, multifamily housing, regulatorily-designated affordable housing)	Yes

If checked, please describe:

CSAH 152 (Cedar Ave) also serves to connect a number of mixed-use, walkable neighborhoods in South Minneapolis and several pedestrian generators, particularly for families, low-income households and BIPOC populations. Below is a selection of key pedestrian generators within 500 feet of the corridor:

-Cedar Childcare Center (Childcare)

-South High School (School)

-Sibley Park & Recreation Center (Recreation & Community Resource)

-Southside Commons (Collection of Nonprofits)

-Corcoran Neighborhood Community Center (Community Center)

-Les Barnard Field (Recreation)

-All Saints Indian Mission Episcopal (Place of Worship)

-Church Nueva Raza (Place of Worship)

-Iglesia Paz Y Santidad (Place of Worship)

In addition, 39% of housing units within 500 feet of the corridor are renter occupied, many of which are located in small and medium-sized apartment buildings distributed throughout the corridor that are a critical source of naturally occurring affordable housing. While affordability levels and unit ages are not readily available at such a small geography, the cohesive mixed-use neighborhood context itself is a major generator of pedestrian traffic.

(Limit 1,400 characters; approximately 200 words)

Measure A: Multimodal Elements and Existing Connections

Response:

The CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project will make the corridor safer and more inviting for all modes traveling along and across CSAH 152 (Cedar Ave).

The primary benefit for people walking and rolling will be the reduction of crossing distances and conflict points. The project includes curb extensions, accessibility improvements, sidewalks (free of obstructions), improved lighting, medians, and enhanced crossings (as feasible), all consistent with the county's ADA Transition Plan goals. Attachment 12 notes key multimodal connections. Within 1/2 mile of the project area, people walking and rolling can access numerous parks, community destinations, and transit, including Metro Transit's B Line Service and the Lake St Blue Line LRT Station.

This project will benefit people taking transit by providing more space dedicated to bus stops and improved sidewalk facilities to access transit. The corridor currently serves Metro Transit Route 22, and is within walking distance to the future B Line Service and Blue Line LRT Light Rail Station at CSAH 3 (Lake St) and TH 55 (Hiawatha Ave). These transit services can better connect residents to downtown Minneapolis, the Mall of America, and Brooklyn Center. This corridor may be a future arterial bus rapid transit service within the 2030-2035 timeframe.

The project benefits people biking by reducing vehicle speeds, weaving, and conflict points at intersections. Longer distance north-south bicycle traffic is served by the existing parallel 17th Ave low-stress bikeway, located approximately 650' to the west of CSAH 152 (Cedar Ave). Once at their destinations, people biking will find more sidewalk space for maneuvering and safely parking their bikes. CSAH 152 (Cedar Ave) is noted as Tier 1 on the RBTN; however, the City of Minneapolis and Hennepin County have facilitated a north-south connection along 17th Ave to facilitate this bicycle connection. CSAH 152 (Cedar Ave) also connects people biking to several other RBTN Tier 1 alignments, including E 34th St and E 40th St. Furthermore, the Midtown Greenway, a Tier 1 RBTN east-west connection across the city is less than 0.2 miles north of the project limits. No barriers listed in the Regional Bicycle Barrier study are identified for this corridor.

For people driving, this project is expected to provide a more safe and predictable environment by designing a roadway with elements to manage driver speeds (such as curb extensions and narrowed lane widths). People driving will also benefit from a smooth pavement surface.

(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. 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. The focus of this section is on the opportunity for public input as opposed to the quality of input. NOTE: A written response is required and failure to respond will result in zero points.

Multiple types of targeted outreach efforts (such as meetings or online/mail outreach) specific to this project with the general public and partner agencies have been used to help identify the project need.

100%

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

50%

At least online/mail outreach effort specific to this project with the general public 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.

Yes

25%

No outreach has led to the selection of this project.

0%

Describe the type(s) of outreach selected for this project (i.e., online or in-person meetings, surveys, demonstration projects), the method(s) used to announce outreach opportunities, and how many people participated. Include any public website links to outreach opportunities.

Response:

While formal public engagement has not started for the CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project, engagement is ongoing for the first phase of the reconstruction north of CSAH 3 (Lake St). Public engagement for the first phase has been iterative, utilizing a variety of open houses and focus groups at neighborhood businesses, organizations and community centers to ensure feedback from the most vulnerable corridor users. Surveys were also used, as well as pop-up engagement at events such as Open Streets. Project goals were and specific complete streets measures are being developed from the feedback heard from all corridor users, but particularly BIPOC populations, low-income populations, youth and older adults as well as those with disabilities. Materials were presented in both English and Spanish to ensure participation by the significant immigrant population from Central and South America which centers around CSAH 3 (Lake St).

Formal engagement for this project will follow a similar iterative process, utilizing a suite of strategies including but not limited to focus groups, open houses, online and paper surveys, and physical signage. Hennepin County will work directly with residents, community organizations, and members of underrepresented groups as project purpose and design is refined.

(Limit 2,800 characters; approximately 400 words)

2. Layout (25 Percent of Points)

Layout includes proposed geometrics and existing and proposed right-of-way boundaries. A basic layout should include a base map (north arrow, scale; legend; city and/or county limits; existing ROW, labeled; existing signals;* and bridge numbers*) and design data (proposed alignments; bike and/or roadway lane widths; shoulder width;* proposed signals;* and proposed ROW). An aerial photograph with a line showing the project?s termini does not suffice and will be awarded zero points. *If applicable*

Layout approved by the applicant and all impacted jurisdictions (i.e., cities/counties/MnDOT. If a MnDOT trunk highway is impacted, approval by MnDOT must have occurred to receive full points. A PDF of the layout must be attached along with letters from each jurisdiction to receive points.

100%

A layout does not apply (signal replacement/signal timing, stand-alone streetscaping, minor intersection improvements). Applicants that are not certain whether a layout is required should contact Colleen Brown at MnDOT Metro State Aid ? colleen.brown@state.mn.us.

100%

For projects where MnDOT trunk highways are impacted and a MnDOT Staff Approved layout is required. Layout approved by the applicant and all impacted local jurisdictions (i.e., cities/counties), and layout review and approval by MnDOT is pending. A PDF of the layout must be attached along with letters from each jurisdiction to receive points.

75%

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

Yes

50%

Layout has been started but is not complete. A PDF of the layout must be attached to receive points.

25%

Layout has not been started

0%	
Attach Layout	1702489940997_Attachment 05 - Potential Concept.pdf
Please upload attachment in PDF form	
Additional Attachments	
Please upload attachment in PDF form	
3. 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	
4. Right-of-Way (25 Percent of Points)	
Right-of-way, permanent or temporary easements, and MnDOT agreement/limited-use permit either not required or all have been acquired	
100%	
Right-of-way, permanent or temporary easements, and/or MnDOT agreement/limited-use permit required - plat, legal descriptions, or official map complete	
50%	
Right-of-way, permanent or temporary easements, and/or MnDOT agreement/limited-use permit required - parcels identified	Yes
25%	
Right-of-way, permanent or temporary easements, and/or MnDOT agreement/limited-use permit required - parcels not all identified	
0%	
5. Railroad Involvement (15 Percent of Points)	
No railroad involvement on project or railroad Right-of-Way agreement is executed (include signature page, if applicable)	Yes
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.	
0%	

Measure A: Cost Effectiveness

Total Project Cost (entered in Project Cost Form):	$15,140,000.00
Enter Amount of the Noise Walls:	$0.00
Total Project Cost subtract the amount of the noise walls:	$15,140,000.00
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	76 KB
Attachment 01 - Project Narrative.pdf	Attachment 01 - Project Narrative	117 KB
Attachment 02 - Project Location Map.pdf	Attachment 02 - Project Location Map	913 KB
Attachment 03 - Existing Condition Photos.pdf	Attachment 03 - Existing Condition Photos	659 KB
Attachment 04 - Potential Typical Sections.pdf	Attachment 04 - Potential Typical Sections	142 KB
Attachment 05 - Potential Concept.pdf	Attachment 05 - Potential Concept	2.6 MB
Attachment 06 - Community Engagement Summary.pdf	Attachment 06 - Community Engagement Summary	1.4 MB
Attachment 07 - Disadvantaged Communities and Resources Map.pdf	Attachment 07 - Disadvantaged Communities and Resources Map	1.3 MB
Attachment 08 - Affordable Housing Access Map and Detail Summary.pdf	Attachment 08 - Affordable Housing Access Map and Detail Summary	624 KB
Attachment 09 - Hennepin County Streetlight Analysis.pdf	Attachment 09 - Hennepin County Streetlight Analysis	132 KB
Attachment 10 - Crash Map and Detail Listing.pdf	Attachment 10 - Crash Map and Detail Listing	1.3 MB
Attachment 11 - Crash Modification Factors.pdf	Attachment 11 - Crash Modification Factors	2.3 MB
Attachment 12 - Multimodal Connections Map.pdf	Attachment 12 - Multimodal Connections Map	1.4 MB
Attachment 13 - City of Minneapolis Support Letter.pdf	Attachment 13 - City of Minneapolis Support Letter	130 KB
Attachment 14 - Metro Transit Support Letter.pdf	Attachment 14 - Metro Transit Support Letter	108 KB

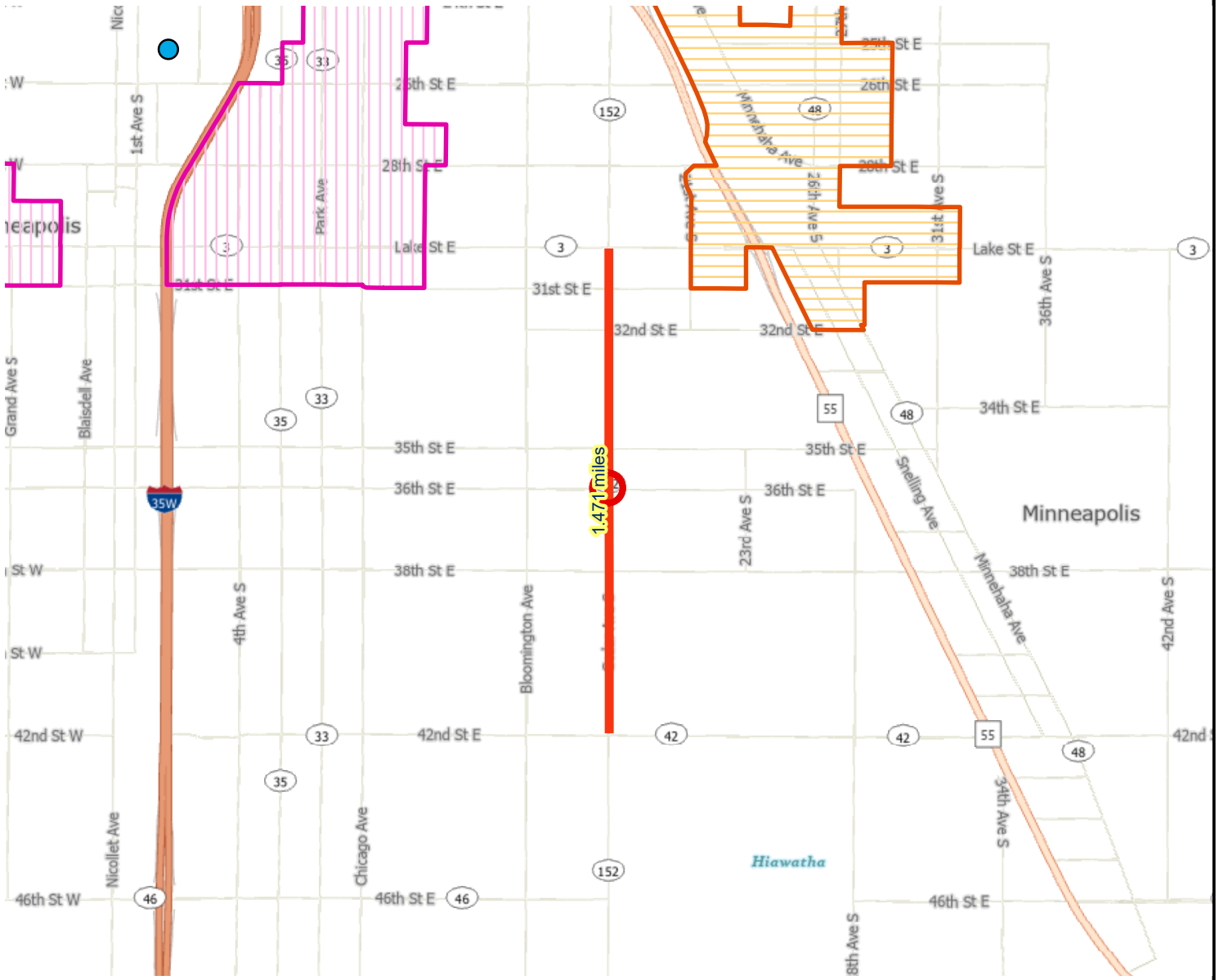
Regional Economy

Roadway Reconstruction/Modernization Project: CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project | Map ID: 16

Results

WITHIN ONE MI of project:
Postsecondary Students: 0

Totals by City:
Minneapolis
Population: 48826
Employment: 16756
Mfg and Dist Employment: 2341



Project Points
Postsecondary Education Centers
Job Concentration Centers
Project
Manfacturing/Distribution Centers

0 0.3 0.6 1.2 1.8 2.4 Miles

Created: 10/30/2023
LandscapeRSA5

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

METROPOLITAN COUNCIL

Transit Connections

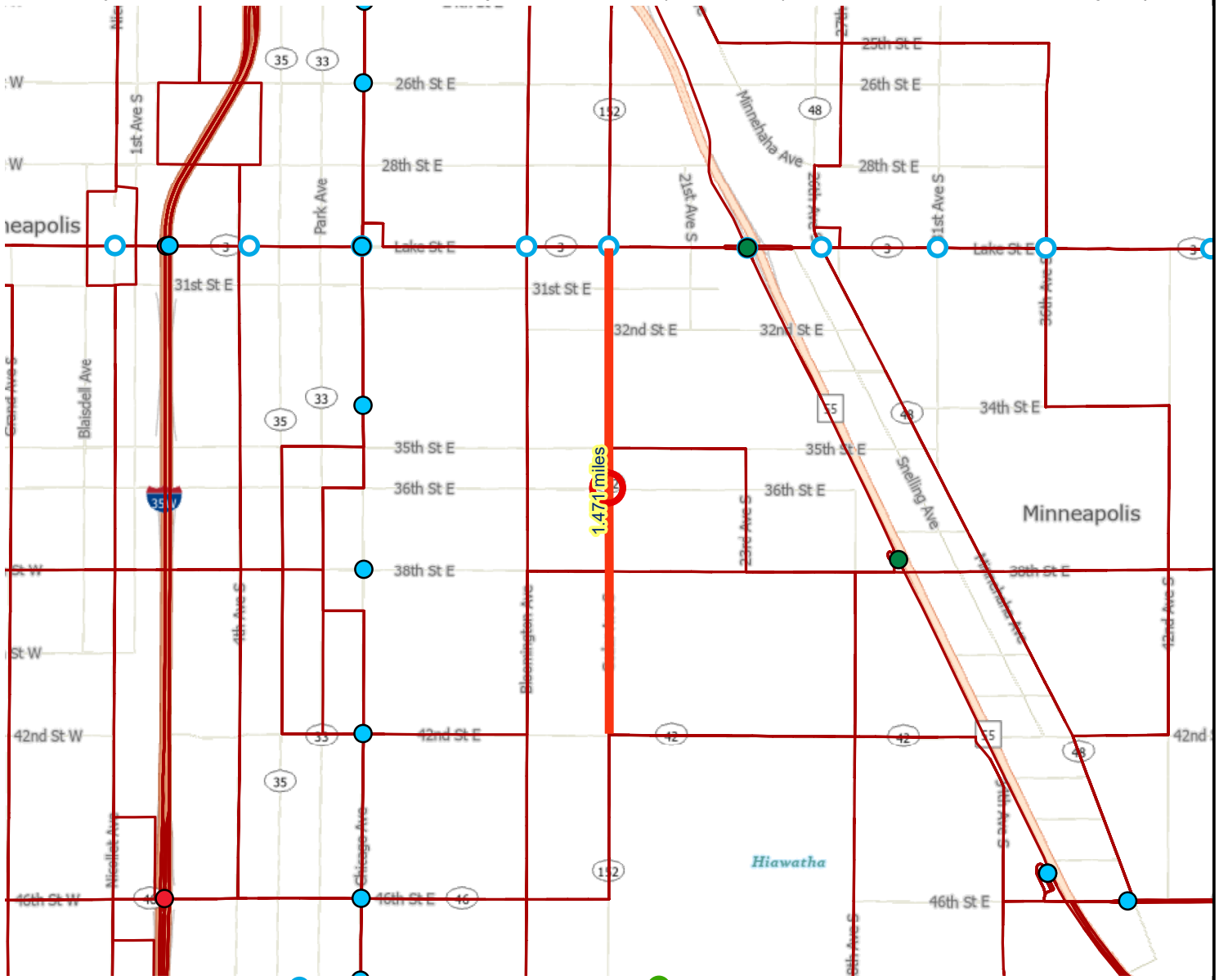
Roadway Reconstruction/Modernization Project: CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project | Map ID: 1

Results

Transit with a Direct Connection to project:
14 21 22 23 46 941
*West Broadway/Cedar
*B Line

**indicates Planned Alignments*

Transit Market areas: 1



Project Points
Project
Project Area
Arterial Bus Rapid Transit
Commuter Rail
Dedicated Bus Rapid Transit
Highway Bus Rapid Transit
Light Rail
Arterial Bus Rapid Transit
Commuter Rail
Dedicated Bus Rapid Transit
Highway Bus Rapid Transit
Light Rail
Transit Routes

0 0.3 0.6 1.2 1.8 2.4 Miles

Created: 10/30/2023
LandscapeRSA3

METROPOLITAN COUNCIL

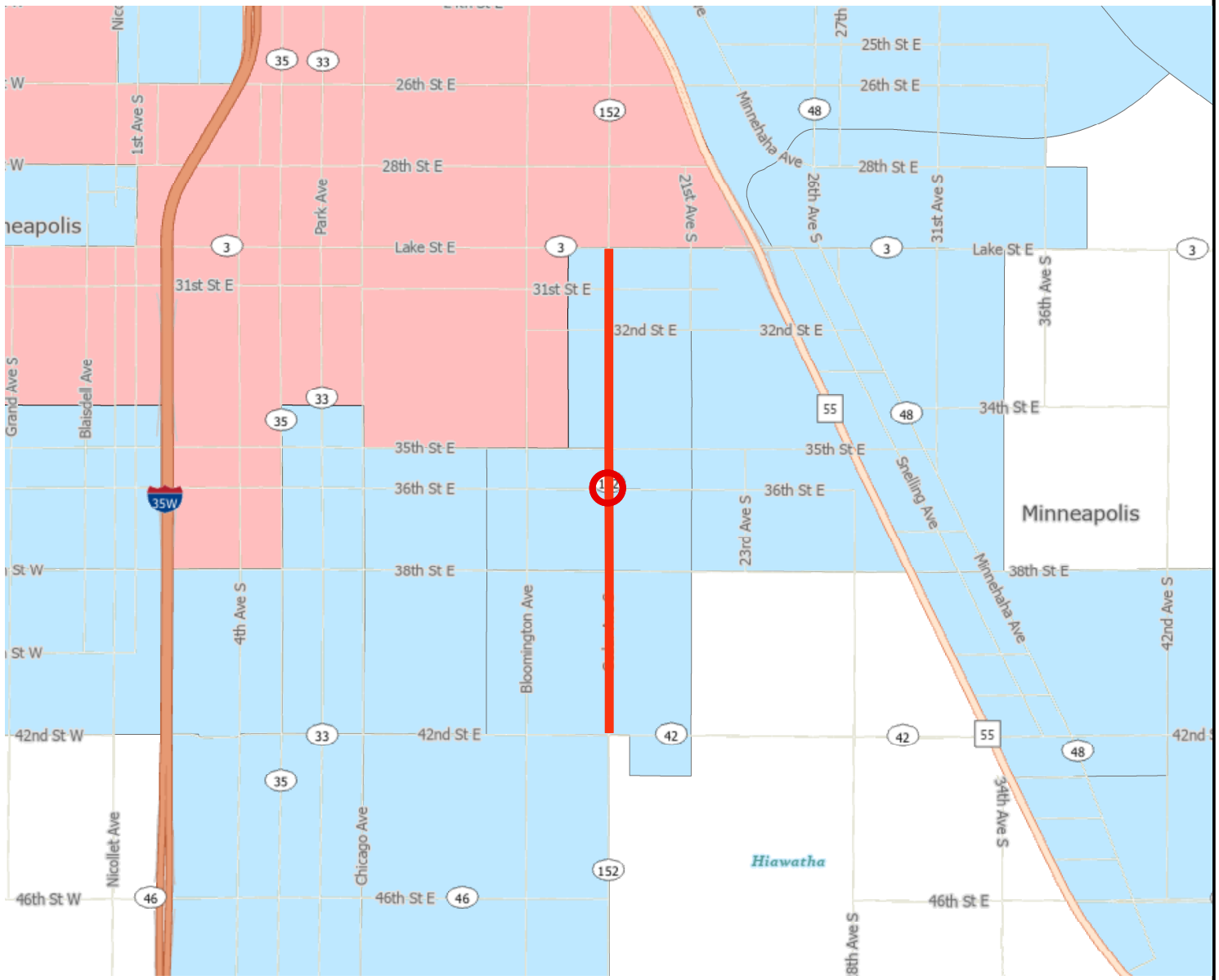
Socio-Economic Conditions

Roadway Reconstruction/Modernization Project: CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project | Map ID: 16986883

Results

Total of publicly subsidized rental housing units in census tracts within 1/2 mile: 2065

Project located in census tract(s) that are ABOVE the regional average for population in poverty or population of color.



Points
Lines
Area of Concentrated Poverty
Regional Environmental Justice Area

0 0.3 0.6 1.2 1.8 2.4 Miles

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LandscapeRSA2

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METROPOLITAN COUNCIL

CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Synchro Report – Congestion Reduction

Existing conditions (AM Peak)

10: Cedar Avenue S & E 31st Street

Direction	All
Future Volume (vph)	1497
Total Delay / Veh (s/v)	13
CO Emissions (kg)	1.46
NOx Emissions (kg)	0.28
VOC Emissions (kg)	0.34

Proposed conditions (AM Peak)

10: Cedar Avenue S & E 31st Street

Direction	All
Future Volume (vph)	1496
Total Delay / Veh (s/v)	12
CO Emissions (kg)	1.42
NOx Emissions (kg)	0.28
VOC Emissions (kg)	0.33

Existing conditions (AM Peak)

20: Cedar Avenue S & E 32nd Street

Direction	All
Future Volume (vph)	1346
Total Delay / Veh (s/v)	8
CO Emissions (kg)	1.20
NOx Emissions (kg)	0.23
VOC Emissions (kg)	0.28

Proposed conditions (AM Peak)

20: Cedar Avenue S & E 32nd Street

Direction	All
Future Volume (vph)	1346
Total Delay / Veh (s/v)	10
CO Emissions (kg)	1.08
NOx Emissions (kg)	0.21
VOC Emissions (kg)	0.25

Existing conditions (AM Peak)

30: Cedar Avenue S & E 34th Street

Direction	All
Future Volume (vph)	1240
Total Delay / Veh (s/v)	4
CO Emissions (kg)	0.84
NOx Emissions (kg)	0.16
VOC Emissions (kg)	0.19

Proposed conditions (AM Peak)

30: Cedar Avenue S & E 34th Street

Direction	All
Future Volume (vph)	1240
Total Delay / Veh (s/v)	2
CO Emissions (kg)	0.71
NOx Emissions (kg)	0.14
VOC Emissions (kg)	0.16

Existing conditions (AM Peak)

40: Cedar Avenue S & E 35th Street

Direction	All
Future Volume (vph)	1596
Total Delay / Veh (s/v)	14
CO Emissions (kg)	1.41
NOx Emissions (kg)	0.27
VOC Emissions (kg)	0.33

Proposed conditions (AM Peak)

40: Cedar Avenue S & E 35th Street

Direction	All
Future Volume (vph)	1596
Total Delay / Veh (s/v)	14
CO Emissions (kg)	1.41
NOx Emissions (kg)	0.27
VOC Emissions (kg)	0.33

Existing conditions (AM Peak)

50: Cedar Avenue S & E 36th Street

Direction	All
Future Volume (vph)	1281
Total Delay / Veh (s/v)	7
CO Emissions (kg)	1.08
NOx Emissions (kg)	0.21
VOC Emissions (kg)	0.25

Proposed conditions (AM Peak)

50: Cedar Avenue S & E 36th Street

Direction	All
Future Volume (vph)	1281
Total Delay / Veh (s/v)	4
CO Emissions (kg)	0.94
NOx Emissions (kg)	0.18
VOC Emissions (kg)	0.22

Existing conditions (AM Peak)

60: Cedar Avenue S & E 38th Street

Direction	All
Future Volume (vph)	1614
Total Delay / Veh (s/v)	17
CO Emissions (kg)	2.41
NOx Emissions (kg)	0.47
VOC Emissions (kg)	0.56

Proposed conditions (AM Peak)

60: Cedar Avenue S & E 38th Street

Direction	All
Future Volume (vph)	1614
Total Delay / Veh (s/v)	17
CO Emissions (kg)	2.41
NOx Emissions (kg)	0.47
VOC Emissions (kg)	0.56

The existing and proposed conditions at the CSAH 152 (Cedar Ave) and 40th St intersection were not evaluated as part of the Synchro Analysis as a right-in/right-out condition was introduced circa 2014 that significantly impacted travel patterns.

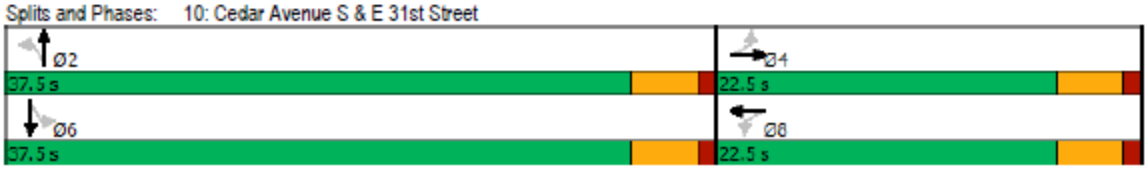
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 31st St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	35	117	29	64	39	725	8	372
Future Volume (vph)	35	117	29	64	39	725	8	372
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0		0.0		0.0
Total Lost Time (s)		4.5		4.5		4.5		4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)		11.2		11.2		35.9		35.9
Actuated g/C Ratio		0.20		0.20		0.64		0.64
v/c Ratio		0.56		0.37		0.74		0.39
Control Delay		23.9		18.2		13.9		6.6
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		23.9		18.2		13.9		6.6
LOS		C		B		B		A
Approach Delay		23.9		18.2		13.9		6.6
Approach LOS		C		B		B		A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56.1	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 13.4	Intersection LOS: B
Intersection Capacity Utilization 79.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 10: Cedar Avenue S & E 31st Street



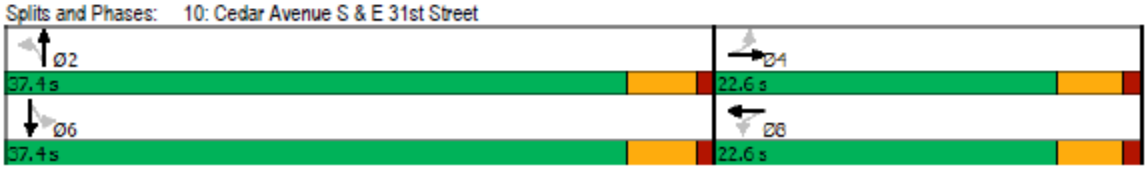
Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 31st St

Timings
Cedar Avenue - Build AM Peak 11/21/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	35	117	29	64	39	725	8	372
Future Volume (vph)	35	117	29	64	39	725	8	372
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.6	22.6	22.6	22.6	37.4	37.4	37.4	37.4
Total Split (%)	37.7%	37.7%	37.7%	37.7%	62.3%	62.3%	62.3%	62.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)		11.2		11.2	35.8	35.8	35.8	35.8
Actuated g/C Ratio		0.20		0.20	0.64	0.64	0.64	0.64
v/c Ratio		0.56		0.37	0.07	0.68	0.03	0.38
Control Delay		23.9		18.1	5.4	11.5	5.4	6.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		23.9		18.1	5.4	11.5	5.4	6.5
LOS		C		B	A	B	A	A
Approach Delay		23.9		18.1		11.2		6.5
Approach LOS		C		B		B		A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 12.0	Intersection LOS: B
Intersection Capacity Utilization 58.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 10: Cedar Avenue S & E 31st Street



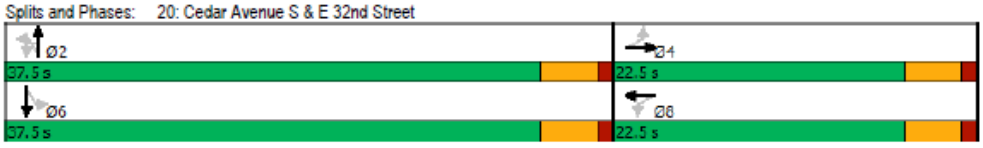
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 32nd St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBU	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	16	33	37	39	1	7	674	27	397
Future Volume (vph)	16	33	37	39	1	7	674	27	397
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		4		8			2		6
Permitted Phases	4		8		2	2		6	
Detector Phase	4	4	8	8	2	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0			0.0		0.0
Total Lost Time (s)		4.5		4.5			4.5		4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		8.3		8.3			38.3		38.3
Actuated g/C Ratio		0.16		0.16			0.73		0.73
v/c Ratio		0.26		0.45			0.60		0.37
Control Delay		17.0		18.9			7.7		5.2
Queue Delay		0.0		0.0			0.0		0.0
Total Delay		17.0		18.9			7.7		5.2
LOS		B		B			A		A
Approach Delay		17.0		18.9			7.7		5.2
Approach LOS		B		B			A		A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 8.3	Intersection LOS: A
Intersection Capacity Utilization 58.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 20: Cedar Avenue S & E 32nd Street



Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 32nd St

County staff is proposing to remove the existing traffic signal at the CSAH 152 and E 32nd St intersection (pending further evaluation and local approval). Therefore, there are no signal timing plans for the proposed conditions.

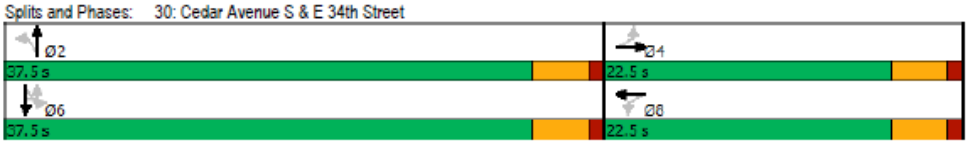
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 34th St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBU	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	7	8	21	6	8	677	4	11	417
Future Volume (vph)	7	8	21	6	8	677	4	11	417
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		2			6
Permitted Phases	4		8		2		6	6	
Detector Phase	4	4	8	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0		0.0			0.0
Total Lost Time (s)		4.5		4.5		4.5			4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		6.6		6.7		45.7			45.7
Actuated g/C Ratio		0.13		0.13		0.87			0.87
v/c Ratio		0.14		0.23		0.48			0.31
Control Delay		16.1		16.4		4.1			2.9
Queue Delay		0.0		0.0		0.0			0.0
Total Delay		16.1		16.4		4.1			2.9
LOS		B		B		A			A
Approach Delay		16.1		16.4		4.1			2.9
Approach LOS		B		B		A			A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.5	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.48	
Intersection Signal Delay: 4.4	Intersection LOS: A
Intersection Capacity Utilization 52.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 30: Cedar Avenue S & E 34th Street



Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 34th St

County staff is proposing to remove the existing traffic signal at the CSAH 152 and E 34th St intersection (pending further evaluation and local approval). Therefore, there are no signal timing plans for the proposed conditions.

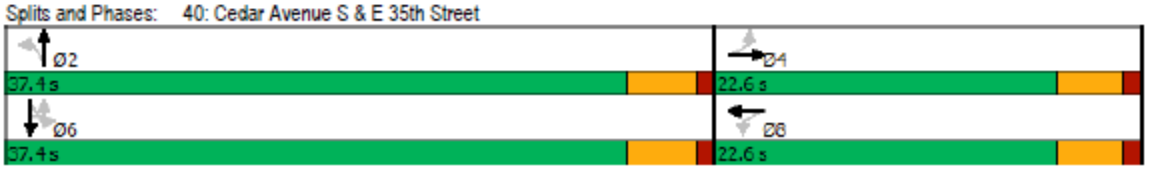
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 35th St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBU	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	26	115	66	141	34	675	1	32	376
Future Volume (vph)	26	115	66	141	34	675	1	32	376
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		2			6
Permitted Phases	4		8		2		6	6	
Detector Phase	4	4	8	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.6	22.6	22.6	22.6	37.4	37.4	37.4	37.4	37.4
Total Split (%)	37.7%	37.7%	37.7%	37.7%	62.3%	62.3%	62.3%	62.3%	62.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5		4.5	4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		13.0		13.0	33.9	33.9		33.9	33.9
Actuated g/C Ratio		0.23		0.23	0.61	0.61		0.61	0.61
v/c Ratio		0.43		0.65	0.07	0.71		0.14	0.40
Control Delay		19.7		27.0	6.2	13.5		7.8	7.7
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0
Total Delay		19.7		27.0	6.2	13.5		7.8	7.7
LOS		B		C	A	B		A	A
Approach Delay		19.7		27.0		13.1			7.7
Approach LOS		B		C		B			A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 67.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 40: Cedar Avenue S & E 35th Street



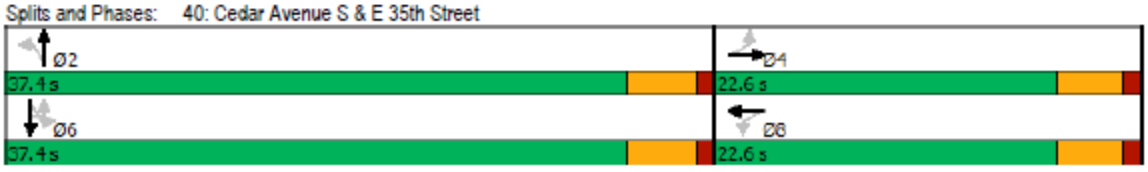
Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 35th St

Timings
Cedar Avenue - Build AM Peak 11/21/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBU	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	26	115	66	141	34	675	1	32	376
Future Volume (vph)	26	115	66	141	34	675	1	32	376
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		2			6
Permitted Phases	4		8		2		6	6	
Detector Phase	4	4	8	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.6	22.6	22.6	22.6	37.4	37.4	37.4	37.4	37.4
Total Split (%)	37.7%	37.7%	37.7%	37.7%	62.3%	62.3%	62.3%	62.3%	62.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5		4.5	4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		13.0		13.0	33.9	33.9		33.9	33.9
Actuated g/C Ratio		0.23		0.23	0.61	0.61		0.61	0.61
v/c Ratio		0.43		0.65	0.07	0.71		0.14	0.40
Control Delay		19.7		27.0	6.2	13.5		7.8	7.7
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0
Total Delay		19.7		27.0	6.2	13.5		7.8	7.7
LOS		B		C	A	B		A	A
Approach Delay		19.7		27.0		13.1			7.7
Approach LOS		B		C		B			A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 67.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 40: Cedar Avenue S & E 35th Street



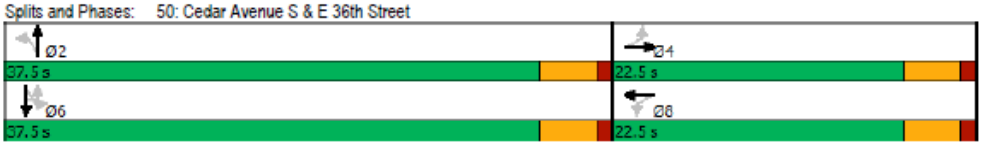
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 36th St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBU	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	24	33	18	20	17	686	3	30	387
Future Volume (vph)	24	33	18	20	17	686	3	30	387
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		2			6
Permitted Phases	4		8		2		6	6	
Detector Phase	4	4	8	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0		0.0			0.0
Total Lost Time (s)		4.5		4.5		4.5			4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		7.5		7.4		41.6			41.6
Actuated g/C Ratio		0.14		0.14		0.80			0.80
v/c Ratio		0.32		0.25		0.53			0.35
Control Delay		20.3		17.3		5.9			4.2
Queue Delay		0.0		0.0		0.0			0.0
Total Delay		20.3		17.3		5.9			4.2
LOS		C		B		A			A
Approach Delay		20.3		17.3		5.9			4.2
Approach LOS		C		B		A			A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.2	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 6.5	Intersection LOS: A
Intersection Capacity Utilization 53.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 50: Cedar Avenue S & E 36th Street



Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 36th St

County staff is proposing to remove the existing traffic signal at the CSAH 152 and E 36th St intersection (pending further evaluation and local approval). Therefore, there are no signal timing plans for the proposed conditions.

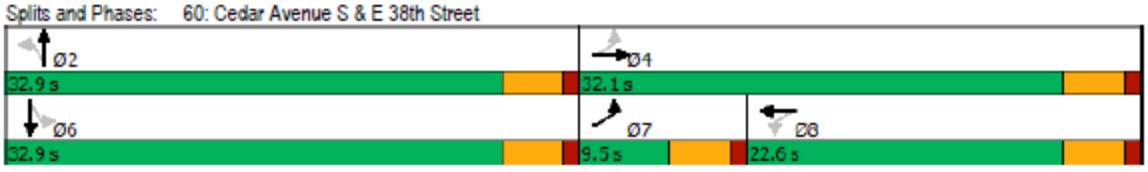
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 38th St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	70	177	67	163	23	594	32	327
Future Volume (vph)	70	177	67	163	23	594	32	327
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	7	4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.5	32.1	22.6	22.6	32.9	32.9	32.9	32.9
Total Split (%)	14.6%	49.4%	34.8%	34.8%	50.6%	50.6%	50.6%	50.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead		Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes				
Recall Mode	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)		15.0		15.0	28.6	28.6	28.6	28.6
Actuated g/C Ratio		0.28		0.28	0.54	0.54	0.54	0.54
v/c Ratio		0.66		0.65	0.05	0.70	0.14	0.40
Control Delay		23.5		22.8	8.0	15.8	9.8	9.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		23.5		22.8	8.0	15.8	9.8	9.5
LOS		C		C	A	B	A	A
Approach Delay		23.5		22.8		15.5		9.5
Approach LOS		C		C		B		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 52.7	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 16.6	Intersection LOS: B
Intersection Capacity Utilization 61.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 60: Cedar Avenue S & E 38th Street



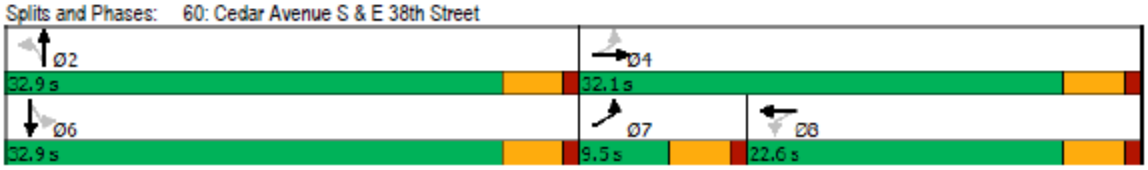
Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 38th St

Timings
Cedar Avenue - Build AM Peak 11/21/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	70	177	67	163	23	594	32	327
Future Volume (vph)	70	177	67	163	23	594	32	327
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	7	4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.5	32.1	22.6	22.6	32.9	32.9	32.9	32.9
Total Split (%)	14.6%	49.4%	34.8%	34.8%	50.6%	50.6%	50.6%	50.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead		Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes				
Recall Mode	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)		15.0		15.0	28.6	28.6	28.6	28.6
Actuated g/C Ratio		0.28		0.28	0.54	0.54	0.54	0.54
v/c Ratio		0.66		0.65	0.05	0.70	0.14	0.40
Control Delay		23.5		22.8	8.0	15.8	9.8	9.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		23.5		22.8	8.0	15.8	9.8	9.5
LOS		C		C	A	B	A	A
Approach Delay		23.5		22.8		15.5		9.5
Approach LOS		C		C		B		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 52.7	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 16.6	Intersection LOS: B
Intersection Capacity Utilization 61.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 60: Cedar Avenue S & E 38th Street



Synchro Report for existing conditions (AM Peak) CSAH 152 & E 40th St

The existing and proposed conditions at the CSAH 152 (Cedar Ave) and 40th St intersection were not evaluated as part of the Synchro Analysis as a right-in/right-out condition was introduced circa 2014 that significantly impacted travel patterns.

Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 40th St

County staff is proposing to remove the existing traffic signal at the CSAH 152 and 40th St intersection (pending further evaluation and local approval). Therefore, there are no signal timing plans for the proposed conditions.

CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Synchro Report – Congestion Reduction

Existing conditions (AM Peak)

10: Cedar Avenue S & E 31st Street

Direction	All
Future Volume (vph)	1497
Total Delay / Veh (s/v)	13
CO Emissions (kg)	1.46
NOx Emissions (kg)	0.28
VOC Emissions (kg)	0.34

Proposed conditions (AM Peak)

10: Cedar Avenue S & E 31st Street

Direction	All
Future Volume (vph)	1496
Total Delay / Veh (s/v)	12
CO Emissions (kg)	1.42
NOx Emissions (kg)	0.28
VOC Emissions (kg)	0.33

Existing conditions (AM Peak)

20: Cedar Avenue S & E 32nd Street

Direction	All
Future Volume (vph)	1346
Total Delay / Veh (s/v)	8
CO Emissions (kg)	1.20
NOx Emissions (kg)	0.23
VOC Emissions (kg)	0.28

Proposed conditions (AM Peak)

20: Cedar Avenue S & E 32nd Street

Direction	All
Future Volume (vph)	1346
Total Delay / Veh (s/v)	10
CO Emissions (kg)	1.08
NOx Emissions (kg)	0.21
VOC Emissions (kg)	0.25

Existing conditions (AM Peak)

30: Cedar Avenue S & E 34th Street

Direction	All
Future Volume (vph)	1240
Total Delay / Veh (s/v)	4
CO Emissions (kg)	0.84
NOx Emissions (kg)	0.16
VOC Emissions (kg)	0.19

Proposed conditions (AM Peak)

30: Cedar Avenue S & E 34th Street

Direction	All
Future Volume (vph)	1240
Total Delay / Veh (s/v)	2
CO Emissions (kg)	0.71
NOx Emissions (kg)	0.14
VOC Emissions (kg)	0.16

Existing conditions (AM Peak)

40: Cedar Avenue S & E 35th Street

Direction	All
Future Volume (vph)	1596
Total Delay / Veh (s/v)	14
CO Emissions (kg)	1.41
NOx Emissions (kg)	0.27
VOC Emissions (kg)	0.33

Proposed conditions (AM Peak)

40: Cedar Avenue S & E 35th Street

Direction	All
Future Volume (vph)	1596
Total Delay / Veh (s/v)	14
CO Emissions (kg)	1.41
NOx Emissions (kg)	0.27
VOC Emissions (kg)	0.33

Existing conditions (AM Peak)

50: Cedar Avenue S & E 36th Street

Direction	All
Future Volume (vph)	1281
Total Delay / Veh (s/v)	7
CO Emissions (kg)	1.08
NOx Emissions (kg)	0.21
VOC Emissions (kg)	0.25

Proposed conditions (AM Peak)

50: Cedar Avenue S & E 36th Street

Direction	All
Future Volume (vph)	1281
Total Delay / Veh (s/v)	4
CO Emissions (kg)	0.94
NOx Emissions (kg)	0.18
VOC Emissions (kg)	0.22

Existing conditions (AM Peak)

60: Cedar Avenue S & E 38th Street

Direction	All
Future Volume (vph)	1614
Total Delay / Veh (s/v)	17
CO Emissions (kg)	2.41
NOx Emissions (kg)	0.47
VOC Emissions (kg)	0.56

Proposed conditions (AM Peak)

60: Cedar Avenue S & E 38th Street

Direction	All
Future Volume (vph)	1614
Total Delay / Veh (s/v)	17
CO Emissions (kg)	2.41
NOx Emissions (kg)	0.47
VOC Emissions (kg)	0.56

The existing and proposed conditions at the CSAH 152 (Cedar Ave) and 40th St intersection were not evaluated as part of the Synchro Analysis as a right-in/right-out condition was introduced circa 2014 that significantly impacted travel patterns.

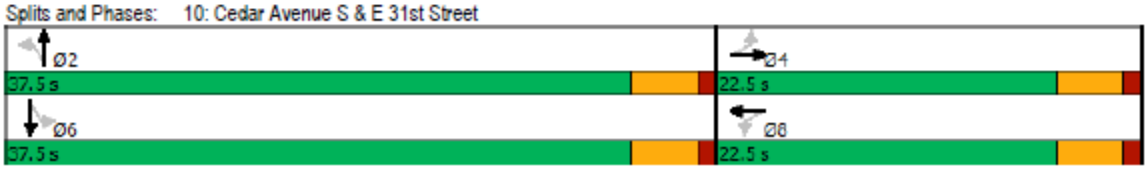
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 31st St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	35	117	29	64	39	725	8	372
Future Volume (vph)	35	117	29	64	39	725	8	372
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0		0.0		0.0
Total Lost Time (s)		4.5		4.5		4.5		4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)		11.2		11.2		35.9		35.9
Actuated g/C Ratio		0.20		0.20		0.64		0.64
v/c Ratio		0.56		0.37		0.74		0.39
Control Delay		23.9		18.2		13.9		6.6
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		23.9		18.2		13.9		6.6
LOS		C		B		B		A
Approach Delay		23.9		18.2		13.9		6.6
Approach LOS		C		B		B		A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56.1	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 13.4	Intersection LOS: B
Intersection Capacity Utilization 79.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 10: Cedar Avenue S & E 31st Street



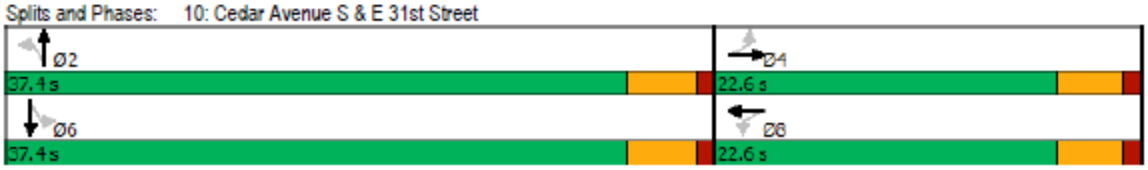
Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 31st St

Timings
Cedar Avenue - Build AM Peak 11/21/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	35	117	29	64	39	725	8	372
Future Volume (vph)	35	117	29	64	39	725	8	372
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.6	22.6	22.6	22.6	37.4	37.4	37.4	37.4
Total Split (%)	37.7%	37.7%	37.7%	37.7%	62.3%	62.3%	62.3%	62.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)		11.2		11.2	35.8	35.8	35.8	35.8
Actuated g/C Ratio		0.20		0.20	0.64	0.64	0.64	0.64
v/c Ratio		0.56		0.37	0.07	0.68	0.03	0.38
Control Delay		23.9		18.1	5.4	11.5	5.4	6.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		23.9		18.1	5.4	11.5	5.4	6.5
LOS		C		B	A	B	A	A
Approach Delay		23.9		18.1		11.2		6.5
Approach LOS		C		B		B		A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 12.0	Intersection LOS: B
Intersection Capacity Utilization 58.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 10: Cedar Avenue S & E 31st Street



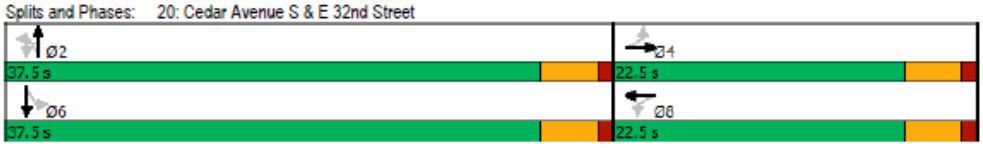
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 32nd St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBU	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	16	33	37	39	1	7	674	27	397
Future Volume (vph)	16	33	37	39	1	7	674	27	397
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		4		8			2		6
Permitted Phases	4		8		2	2		6	
Detector Phase	4	4	8	8	2	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0			0.0		0.0
Total Lost Time (s)		4.5		4.5			4.5		4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		8.3		8.3			38.3		38.3
Actuated g/C Ratio		0.16		0.16			0.73		0.73
v/c Ratio		0.26		0.45			0.60		0.37
Control Delay		17.0		18.9			7.7		5.2
Queue Delay		0.0		0.0			0.0		0.0
Total Delay		17.0		18.9			7.7		5.2
LOS		B		B			A		A
Approach Delay		17.0		18.9			7.7		5.2
Approach LOS		B		B			A		A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 8.3	Intersection LOS: A
Intersection Capacity Utilization 58.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 20: Cedar Avenue S & E 32nd Street



Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 32nd St

County staff is proposing to remove the existing traffic signal at the CSAH 152 and E 32nd St intersection (pending further evaluation and local approval). Therefore, there are no signal timing plans for the proposed conditions.

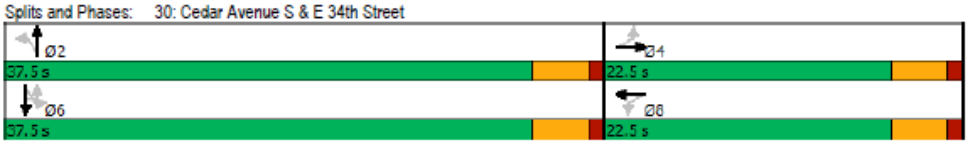
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 34th St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBU	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	7	8	21	6	8	677	4	11	417
Future Volume (vph)	7	8	21	6	8	677	4	11	417
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		2			6
Permitted Phases	4		8		2		6	6	
Detector Phase	4	4	8	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0		0.0			0.0
Total Lost Time (s)		4.5		4.5		4.5			4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		6.6		6.7		45.7			45.7
Actuated g/C Ratio		0.13		0.13		0.87			0.87
v/c Ratio		0.14		0.23		0.48			0.31
Control Delay		16.1		16.4		4.1			2.9
Queue Delay		0.0		0.0		0.0			0.0
Total Delay		16.1		16.4		4.1			2.9
LOS		B		B		A			A
Approach Delay		16.1		16.4		4.1			2.9
Approach LOS		B		B		A			A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.5	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.48	
Intersection Signal Delay: 4.4	Intersection LOS: A
Intersection Capacity Utilization 52.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 30: Cedar Avenue S & E 34th Street



Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 34th St

County staff is proposing to remove the existing traffic signal at the CSAH 152 and E 34th St intersection (pending further evaluation and local approval). Therefore, there are no signal timing plans for the proposed conditions.

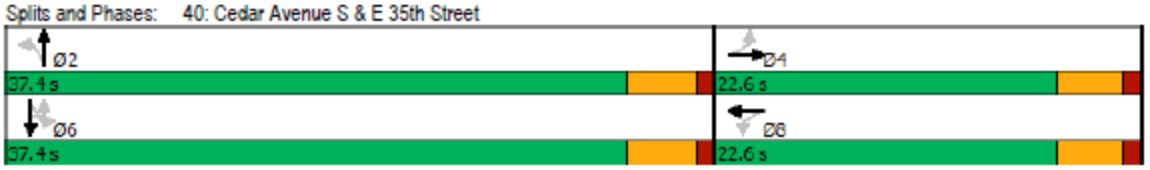
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 35th St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBU	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	26	115	66	141	34	675	1	32	376
Future Volume (vph)	26	115	66	141	34	675	1	32	376
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		2			6
Permitted Phases	4		8		2		6	6	
Detector Phase	4	4	8	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.6	22.6	22.6	22.6	37.4	37.4	37.4	37.4	37.4
Total Split (%)	37.7%	37.7%	37.7%	37.7%	62.3%	62.3%	62.3%	62.3%	62.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5		4.5	4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		13.0		13.0	33.9	33.9		33.9	33.9
Actuated g/C Ratio		0.23		0.23	0.61	0.61		0.61	0.61
v/c Ratio		0.43		0.65	0.07	0.71		0.14	0.40
Control Delay		19.7		27.0	6.2	13.5		7.8	7.7
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0
Total Delay		19.7		27.0	6.2	13.5		7.8	7.7
LOS		B		C	A	B		A	A
Approach Delay		19.7		27.0		13.1			7.7
Approach LOS		B		C		B			A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 67.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 40: Cedar Avenue S & E 35th Street



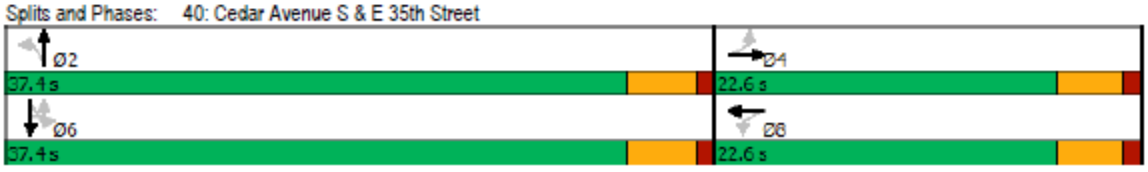
Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 35th St

Timings
Cedar Avenue - Build AM Peak 11/21/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBU	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	26	115	66	141	34	675	1	32	376
Future Volume (vph)	26	115	66	141	34	675	1	32	376
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		2			6
Permitted Phases	4		8		2		6	6	
Detector Phase	4	4	8	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.6	22.6	22.6	22.6	37.4	37.4	37.4	37.4	37.4
Total Split (%)	37.7%	37.7%	37.7%	37.7%	62.3%	62.3%	62.3%	62.3%	62.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5		4.5	4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		13.0		13.0	33.9	33.9		33.9	33.9
Actuated g/C Ratio		0.23		0.23	0.61	0.61		0.61	0.61
v/c Ratio		0.43		0.65	0.07	0.71		0.14	0.40
Control Delay		19.7		27.0	6.2	13.5		7.8	7.7
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0
Total Delay		19.7		27.0	6.2	13.5		7.8	7.7
LOS		B		C	A	B		A	A
Approach Delay		19.7		27.0		13.1			7.7
Approach LOS		B		C		B			A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 67.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 40: Cedar Avenue S & E 35th Street



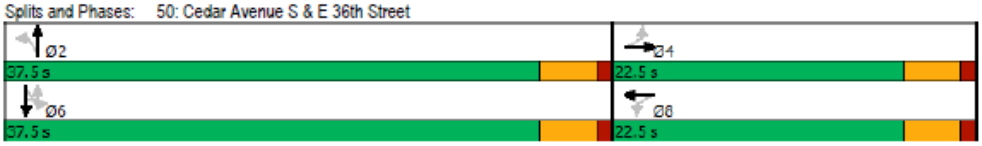
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 36th St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBU	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	24	33	18	20	17	686	3	30	387
Future Volume (vph)	24	33	18	20	17	686	3	30	387
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		2			6
Permitted Phases	4		8		2		6	6	
Detector Phase	4	4	8	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0		0.0			0.0
Total Lost Time (s)		4.5		4.5		4.5			4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		7.5		7.4		41.6			41.6
Actuated g/C Ratio		0.14		0.14		0.80			0.80
v/c Ratio		0.32		0.25		0.53			0.35
Control Delay		20.3		17.3		5.9			4.2
Queue Delay		0.0		0.0		0.0			0.0
Total Delay		20.3		17.3		5.9			4.2
LOS		C		B		A			A
Approach Delay		20.3		17.3		5.9			4.2
Approach LOS		C		B		A			A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.2	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 6.5	Intersection LOS: A
Intersection Capacity Utilization 53.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 50: Cedar Avenue S & E 36th Street



Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 36th St

County staff is proposing to remove the existing traffic signal at the CSAH 152 and E 36th St intersection (pending further evaluation and local approval). Therefore, there are no signal timing plans for the proposed conditions.

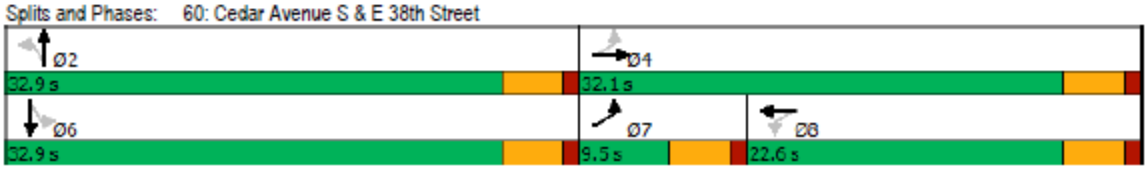
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 38th St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	70	177	67	163	23	594	32	327
Future Volume (vph)	70	177	67	163	23	594	32	327
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	7	4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.5	32.1	22.6	22.6	32.9	32.9	32.9	32.9
Total Split (%)	14.6%	49.4%	34.8%	34.8%	50.6%	50.6%	50.6%	50.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead		Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes				
Recall Mode	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)		15.0		15.0	28.6	28.6	28.6	28.6
Actuated g/C Ratio		0.28		0.28	0.54	0.54	0.54	0.54
v/c Ratio		0.66		0.65	0.05	0.70	0.14	0.40
Control Delay		23.5		22.8	8.0	15.8	9.8	9.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		23.5		22.8	8.0	15.8	9.8	9.5
LOS		C		C	A	B	A	A
Approach Delay		23.5		22.8		15.5		9.5
Approach LOS		C		C		B		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 52.7	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 16.6	Intersection LOS: B
Intersection Capacity Utilization 61.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 60: Cedar Avenue S & E 38th Street



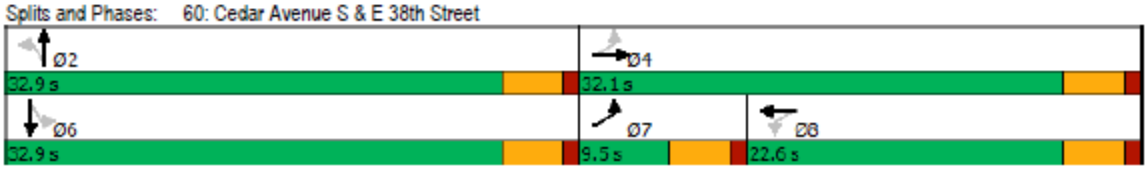
Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 38th St

Timings
Cedar Avenue - Build AM Peak 11/21/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	70	177	67	163	23	594	32	327
Future Volume (vph)	70	177	67	163	23	594	32	327
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	7	4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.5	32.1	22.6	22.6	32.9	32.9	32.9	32.9
Total Split (%)	14.6%	49.4%	34.8%	34.8%	50.6%	50.6%	50.6%	50.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead		Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes				
Recall Mode	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)		15.0		15.0	28.6	28.6	28.6	28.6
Actuated g/C Ratio		0.28		0.28	0.54	0.54	0.54	0.54
v/c Ratio		0.66		0.65	0.05	0.70	0.14	0.40
Control Delay		23.5		22.8	8.0	15.8	9.8	9.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		23.5		22.8	8.0	15.8	9.8	9.5
LOS		C		C	A	B	A	A
Approach Delay		23.5		22.8		15.5		9.5
Approach LOS		C		C		B		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 52.7	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 16.6	Intersection LOS: B
Intersection Capacity Utilization 61.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 60: Cedar Avenue S & E 38th Street



Synchro Report for existing conditions (AM Peak) CSAH 152 & E 40th St

The existing and proposed conditions at the CSAH 152 (Cedar Ave) and 40th St intersection were not evaluated as part of the Synchro Analysis as a right-in/right-out condition was introduced circa 2014 that significantly impacted travel patterns.

Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 40th St

County staff is proposing to remove the existing traffic signal at the CSAH 152 and 40th St intersection (pending further evaluation and local approval). Therefore, there are no signal timing plans for the proposed conditions.

CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Synchro Report – Congestion Reduction

Existing conditions (AM Peak)

10: Cedar Avenue S & E 31st Street

Direction	All
Future Volume (vph)	1497
Total Delay / Veh (s/v)	13
CO Emissions (kg)	1.46
NOx Emissions (kg)	0.28
VOC Emissions (kg)	0.34

Proposed conditions (AM Peak)

10: Cedar Avenue S & E 31st Street

Direction	All
Future Volume (vph)	1496
Total Delay / Veh (s/v)	12
CO Emissions (kg)	1.42
NOx Emissions (kg)	0.28
VOC Emissions (kg)	0.33

Existing conditions (AM Peak)

20: Cedar Avenue S & E 32nd Street

Direction	All
Future Volume (vph)	1346
Total Delay / Veh (s/v)	8
CO Emissions (kg)	1.20
NOx Emissions (kg)	0.23
VOC Emissions (kg)	0.28

Proposed conditions (AM Peak)

20: Cedar Avenue S & E 32nd Street

Direction	All
Future Volume (vph)	1346
Total Delay / Veh (s/v)	10
CO Emissions (kg)	1.08
NOx Emissions (kg)	0.21
VOC Emissions (kg)	0.25

Existing conditions (AM Peak)

30: Cedar Avenue S & E 34th Street

Direction	All
Future Volume (vph)	1240
Total Delay / Veh (s/v)	4
CO Emissions (kg)	0.84
NOx Emissions (kg)	0.16
VOC Emissions (kg)	0.19

Proposed conditions (AM Peak)

30: Cedar Avenue S & E 34th Street

Direction	All
Future Volume (vph)	1240
Total Delay / Veh (s/v)	2
CO Emissions (kg)	0.71
NOx Emissions (kg)	0.14
VOC Emissions (kg)	0.16

Existing conditions (AM Peak)

40: Cedar Avenue S & E 35th Street

Direction	All
Future Volume (vph)	1596
Total Delay / Veh (s/v)	14
CO Emissions (kg)	1.41
NOx Emissions (kg)	0.27
VOC Emissions (kg)	0.33

Proposed conditions (AM Peak)

40: Cedar Avenue S & E 35th Street

Direction	All
Future Volume (vph)	1596
Total Delay / Veh (s/v)	14
CO Emissions (kg)	1.41
NOx Emissions (kg)	0.27
VOC Emissions (kg)	0.33

Existing conditions (AM Peak)

50: Cedar Avenue S & E 36th Street

Direction	All
Future Volume (vph)	1281
Total Delay / Veh (s/v)	7
CO Emissions (kg)	1.08
NOx Emissions (kg)	0.21
VOC Emissions (kg)	0.25

Proposed conditions (AM Peak)

50: Cedar Avenue S & E 36th Street

Direction	All
Future Volume (vph)	1281
Total Delay / Veh (s/v)	4
CO Emissions (kg)	0.94
NOx Emissions (kg)	0.18
VOC Emissions (kg)	0.22

Existing conditions (AM Peak)

60: Cedar Avenue S & E 38th Street

Direction	All
Future Volume (vph)	1614
Total Delay / Veh (s/v)	17
CO Emissions (kg)	2.41
NOx Emissions (kg)	0.47
VOC Emissions (kg)	0.56

Proposed conditions (AM Peak)

60: Cedar Avenue S & E 38th Street

Direction	All
Future Volume (vph)	1614
Total Delay / Veh (s/v)	17
CO Emissions (kg)	2.41
NOx Emissions (kg)	0.47
VOC Emissions (kg)	0.56

The existing and proposed conditions at the CSAH 152 (Cedar Ave) and 40th St intersection were not evaluated as part of the Synchro Analysis as a right-in/right-out condition was introduced circa 2014 that significantly impacted travel patterns.

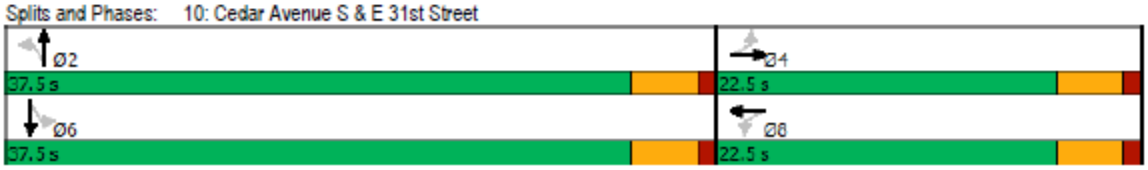
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 31st St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	35	117	29	64	39	725	8	372
Future Volume (vph)	35	117	29	64	39	725	8	372
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0		0.0		0.0
Total Lost Time (s)		4.5		4.5		4.5		4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)		11.2		11.2		35.9		35.9
Actuated g/C Ratio		0.20		0.20		0.64		0.64
v/c Ratio		0.56		0.37		0.74		0.39
Control Delay		23.9		18.2		13.9		6.6
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		23.9		18.2		13.9		6.6
LOS		C		B		B		A
Approach Delay		23.9		18.2		13.9		6.6
Approach LOS		C		B		B		A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56.1	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 13.4	Intersection LOS: B
Intersection Capacity Utilization 79.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 10: Cedar Avenue S & E 31st Street



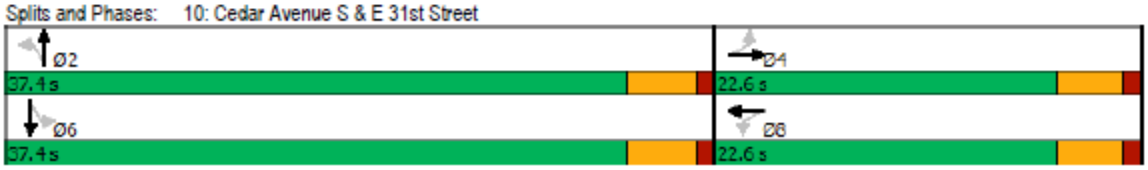
Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 31st St

Timings
Cedar Avenue - Build AM Peak 11/21/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	35	117	29	64	39	725	8	372
Future Volume (vph)	35	117	29	64	39	725	8	372
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.6	22.6	22.6	22.6	37.4	37.4	37.4	37.4
Total Split (%)	37.7%	37.7%	37.7%	37.7%	62.3%	62.3%	62.3%	62.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)		11.2		11.2	35.8	35.8	35.8	35.8
Actuated g/C Ratio		0.20		0.20	0.64	0.64	0.64	0.64
v/c Ratio		0.56		0.37	0.07	0.68	0.03	0.38
Control Delay		23.9		18.1	5.4	11.5	5.4	6.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		23.9		18.1	5.4	11.5	5.4	6.5
LOS		C		B	A	B	A	A
Approach Delay		23.9		18.1		11.2		6.5
Approach LOS		C		B		B		A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 12.0	Intersection LOS: B
Intersection Capacity Utilization 58.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 10: Cedar Avenue S & E 31st Street



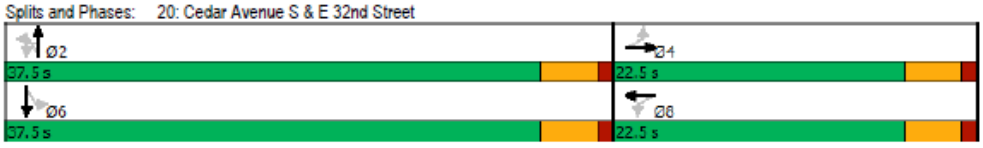
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 32nd St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBU	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	16	33	37	39	1	7	674	27	397
Future Volume (vph)	16	33	37	39	1	7	674	27	397
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		4		8			2		6
Permitted Phases	4		8		2	2		6	
Detector Phase	4	4	8	8	2	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0			0.0		0.0
Total Lost Time (s)		4.5		4.5			4.5		4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		8.3		8.3			38.3		38.3
Actuated g/C Ratio		0.16		0.16			0.73		0.73
v/c Ratio		0.26		0.45			0.60		0.37
Control Delay		17.0		18.9			7.7		5.2
Queue Delay		0.0		0.0			0.0		0.0
Total Delay		17.0		18.9			7.7		5.2
LOS		B		B			A		A
Approach Delay		17.0		18.9			7.7		5.2
Approach LOS		B		B			A		A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 8.3	Intersection LOS: A
Intersection Capacity Utilization 58.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 20: Cedar Avenue S & E 32nd Street



Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 32nd St

County staff is proposing to remove the existing traffic signal at the CSAH 152 and E 32nd St intersection (pending further evaluation and local approval). Therefore, there are no signal timing plans for the proposed conditions.

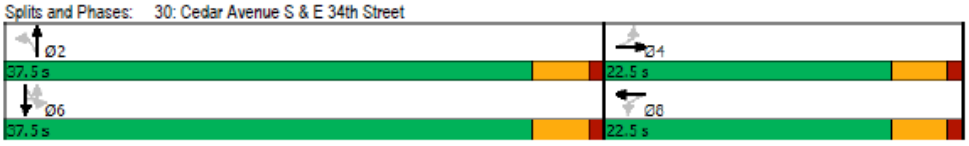
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 34th St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBU	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	7	8	21	6	8	677	4	11	417
Future Volume (vph)	7	8	21	6	8	677	4	11	417
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		2			6
Permitted Phases	4		8		2		6	6	
Detector Phase	4	4	8	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0		0.0			0.0
Total Lost Time (s)		4.5		4.5		4.5			4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		6.6		6.7		45.7			45.7
Actuated g/C Ratio		0.13		0.13		0.87			0.87
v/c Ratio		0.14		0.23		0.48			0.31
Control Delay		16.1		16.4		4.1			2.9
Queue Delay		0.0		0.0		0.0			0.0
Total Delay		16.1		16.4		4.1			2.9
LOS		B		B		A			A
Approach Delay		16.1		16.4		4.1			2.9
Approach LOS		B		B		A			A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.5	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.48	
Intersection Signal Delay: 4.4	Intersection LOS: A
Intersection Capacity Utilization 52.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 30: Cedar Avenue S & E 34th Street



Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 34th St

County staff is proposing to remove the existing traffic signal at the CSAH 152 and E 34th St intersection (pending further evaluation and local approval). Therefore, there are no signal timing plans for the proposed conditions.

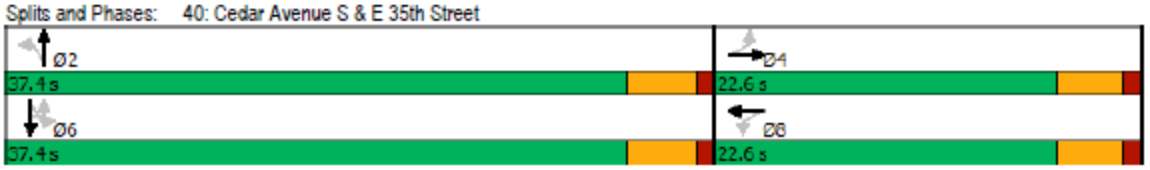
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 35th St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBU	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	26	115	66	141	34	675	1	32	376
Future Volume (vph)	26	115	66	141	34	675	1	32	376
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		2			6
Permitted Phases	4		8		2		6	6	
Detector Phase	4	4	8	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.6	22.6	22.6	22.6	37.4	37.4	37.4	37.4	37.4
Total Split (%)	37.7%	37.7%	37.7%	37.7%	62.3%	62.3%	62.3%	62.3%	62.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5		4.5	4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		13.0		13.0	33.9	33.9		33.9	33.9
Actuated g/C Ratio		0.23		0.23	0.61	0.61		0.61	0.61
v/c Ratio		0.43		0.65	0.07	0.71		0.14	0.40
Control Delay		19.7		27.0	6.2	13.5		7.8	7.7
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0
Total Delay		19.7		27.0	6.2	13.5		7.8	7.7
LOS		B		C	A	B		A	A
Approach Delay		19.7		27.0		13.1			7.7
Approach LOS		B		C		B			A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 67.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 40: Cedar Avenue S & E 35th Street



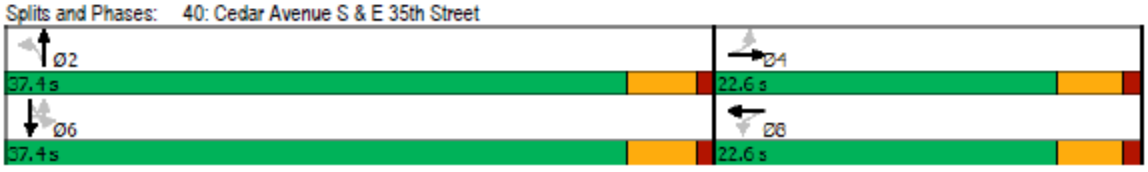
Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 35th St

Timings
Cedar Avenue - Build AM Peak 11/21/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBU	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	26	115	66	141	34	675	1	32	376
Future Volume (vph)	26	115	66	141	34	675	1	32	376
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		2			6
Permitted Phases	4		8		2		6	6	
Detector Phase	4	4	8	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.6	22.6	22.6	22.6	37.4	37.4	37.4	37.4	37.4
Total Split (%)	37.7%	37.7%	37.7%	37.7%	62.3%	62.3%	62.3%	62.3%	62.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5		4.5	4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		13.0		13.0	33.9	33.9		33.9	33.9
Actuated g/C Ratio		0.23		0.23	0.61	0.61		0.61	0.61
v/c Ratio		0.43		0.65	0.07	0.71		0.14	0.40
Control Delay		19.7		27.0	6.2	13.5		7.8	7.7
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0
Total Delay		19.7		27.0	6.2	13.5		7.8	7.7
LOS		B		C	A	B		A	A
Approach Delay		19.7		27.0		13.1			7.7
Approach LOS		B		C		B			A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 67.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 40: Cedar Avenue S & E 35th Street



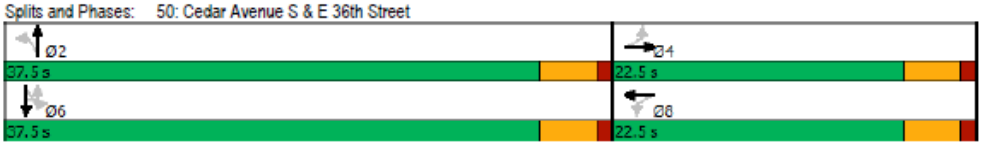
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 36th St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBU	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	24	33	18	20	17	686	3	30	387
Future Volume (vph)	24	33	18	20	17	686	3	30	387
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		2			6
Permitted Phases	4		8		2		6	6	
Detector Phase	4	4	8	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0		0.0			0.0
Total Lost Time (s)		4.5		4.5		4.5			4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		7.5		7.4		41.6			41.6
Actuated g/C Ratio		0.14		0.14		0.80			0.80
v/c Ratio		0.32		0.25		0.53			0.35
Control Delay		20.3		17.3		5.9			4.2
Queue Delay		0.0		0.0		0.0			0.0
Total Delay		20.3		17.3		5.9			4.2
LOS		C		B		A			A
Approach Delay		20.3		17.3		5.9			4.2
Approach LOS		C		B		A			A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.2	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 6.5	Intersection LOS: A
Intersection Capacity Utilization 53.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 50: Cedar Avenue S & E 36th Street



Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 36th St

County staff is proposing to remove the existing traffic signal at the CSAH 152 and E 36th St intersection (pending further evaluation and local approval). Therefore, there are no signal timing plans for the proposed conditions.

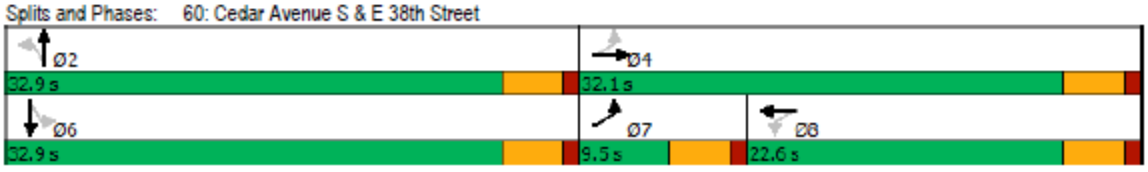
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 38th St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	70	177	67	163	23	594	32	327
Future Volume (vph)	70	177	67	163	23	594	32	327
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	7	4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.5	32.1	22.6	22.6	32.9	32.9	32.9	32.9
Total Split (%)	14.6%	49.4%	34.8%	34.8%	50.6%	50.6%	50.6%	50.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead		Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes				
Recall Mode	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)		15.0		15.0	28.6	28.6	28.6	28.6
Actuated g/C Ratio		0.28		0.28	0.54	0.54	0.54	0.54
v/c Ratio		0.66		0.65	0.05	0.70	0.14	0.40
Control Delay		23.5		22.8	8.0	15.8	9.8	9.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		23.5		22.8	8.0	15.8	9.8	9.5
LOS		C		C	A	B	A	A
Approach Delay		23.5		22.8		15.5		9.5
Approach LOS		C		C		B		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 52.7	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 16.6	Intersection LOS: B
Intersection Capacity Utilization 61.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 60: Cedar Avenue S & E 38th Street



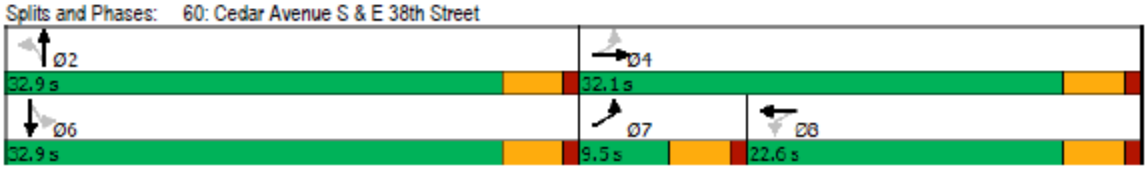
Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 38th St

Timings
Cedar Avenue - Build AM Peak 11/21/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	70	177	67	163	23	594	32	327
Future Volume (vph)	70	177	67	163	23	594	32	327
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	7	4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.5	32.1	22.6	22.6	32.9	32.9	32.9	32.9
Total Split (%)	14.6%	49.4%	34.8%	34.8%	50.6%	50.6%	50.6%	50.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead		Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes				
Recall Mode	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)		15.0		15.0	28.6	28.6	28.6	28.6
Actuated g/C Ratio		0.28		0.28	0.54	0.54	0.54	0.54
v/c Ratio		0.66		0.65	0.05	0.70	0.14	0.40
Control Delay		23.5		22.8	8.0	15.8	9.8	9.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		23.5		22.8	8.0	15.8	9.8	9.5
LOS		C		C	A	B	A	A
Approach Delay		23.5		22.8		15.5		9.5
Approach LOS		C		C		B		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 52.7	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 16.6	Intersection LOS: B
Intersection Capacity Utilization 61.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 60: Cedar Avenue S & E 38th Street



Synchro Report for existing conditions (AM Peak) CSAH 152 & E 40th St

The existing and proposed conditions at the CSAH 152 (Cedar Ave) and 40th St intersection were not evaluated as part of the Synchro Analysis as a right-in/right-out condition was introduced circa 2014 that significantly impacted travel patterns.

Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 40th St

County staff is proposing to remove the existing traffic signal at the CSAH 152 and 40th St intersection (pending further evaluation and local approval). Therefore, there are no signal timing plans for the proposed conditions.

CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Synchro Report – Congestion Reduction

Existing conditions (AM Peak)

10: Cedar Avenue S & E 31st Street

Direction	All
Future Volume (vph)	1497
Total Delay / Veh (s/v)	13
CO Emissions (kg)	1.46
NOx Emissions (kg)	0.28
VOC Emissions (kg)	0.34

Proposed conditions (AM Peak)

10: Cedar Avenue S & E 31st Street

Direction	All
Future Volume (vph)	1496
Total Delay / Veh (s/v)	12
CO Emissions (kg)	1.42
NOx Emissions (kg)	0.28
VOC Emissions (kg)	0.33

Existing conditions (AM Peak)

20: Cedar Avenue S & E 32nd Street

Direction	All
Future Volume (vph)	1346
Total Delay / Veh (s/v)	8
CO Emissions (kg)	1.20
NOx Emissions (kg)	0.23
VOC Emissions (kg)	0.28

Proposed conditions (AM Peak)

20: Cedar Avenue S & E 32nd Street

Direction	All
Future Volume (vph)	1346
Total Delay / Veh (s/v)	10
CO Emissions (kg)	1.08
NOx Emissions (kg)	0.21
VOC Emissions (kg)	0.25

Existing conditions (AM Peak)

30: Cedar Avenue S & E 34th Street

Direction	All
Future Volume (vph)	1240
Total Delay / Veh (s/v)	4
CO Emissions (kg)	0.84
NOx Emissions (kg)	0.16
VOC Emissions (kg)	0.19

Proposed conditions (AM Peak)

30: Cedar Avenue S & E 34th Street

Direction	All
Future Volume (vph)	1240
Total Delay / Veh (s/v)	2
CO Emissions (kg)	0.71
NOx Emissions (kg)	0.14
VOC Emissions (kg)	0.16

Existing conditions (AM Peak)

40: Cedar Avenue S & E 35th Street

Direction	All
Future Volume (vph)	1596
Total Delay / Veh (s/v)	14
CO Emissions (kg)	1.41
NOx Emissions (kg)	0.27
VOC Emissions (kg)	0.33

Proposed conditions (AM Peak)

40: Cedar Avenue S & E 35th Street

Direction	All
Future Volume (vph)	1596
Total Delay / Veh (s/v)	14
CO Emissions (kg)	1.41
NOx Emissions (kg)	0.27
VOC Emissions (kg)	0.33

Existing conditions (AM Peak)

50: Cedar Avenue S & E 36th Street

Direction	All
Future Volume (vph)	1281
Total Delay / Veh (s/v)	7
CO Emissions (kg)	1.08
NOx Emissions (kg)	0.21
VOC Emissions (kg)	0.25

Proposed conditions (AM Peak)

50: Cedar Avenue S & E 36th Street

Direction	All
Future Volume (vph)	1281
Total Delay / Veh (s/v)	4
CO Emissions (kg)	0.94
NOx Emissions (kg)	0.18
VOC Emissions (kg)	0.22

Existing conditions (AM Peak)

60: Cedar Avenue S & E 38th Street

Direction	All
Future Volume (vph)	1614
Total Delay / Veh (s/v)	17
CO Emissions (kg)	2.41
NOx Emissions (kg)	0.47
VOC Emissions (kg)	0.56

Proposed conditions (AM Peak)

60: Cedar Avenue S & E 38th Street

Direction	All
Future Volume (vph)	1614
Total Delay / Veh (s/v)	17
CO Emissions (kg)	2.41
NOx Emissions (kg)	0.47
VOC Emissions (kg)	0.56

The existing and proposed conditions at the CSAH 152 (Cedar Ave) and 40th St intersection were not evaluated as part of the Synchro Analysis as a right-in/right-out condition was introduced circa 2014 that significantly impacted travel patterns.

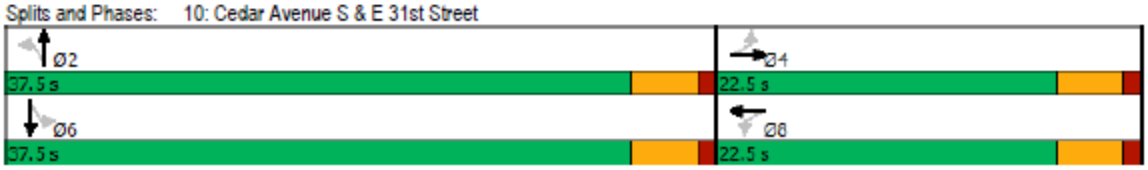
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 31st St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	35	117	29	64	39	725	8	372
Future Volume (vph)	35	117	29	64	39	725	8	372
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0		0.0		0.0
Total Lost Time (s)		4.5		4.5		4.5		4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)		11.2		11.2		35.9		35.9
Actuated g/C Ratio		0.20		0.20		0.64		0.64
v/c Ratio		0.56		0.37		0.74		0.39
Control Delay		23.9		18.2		13.9		6.6
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		23.9		18.2		13.9		6.6
LOS		C		B		B		A
Approach Delay		23.9		18.2		13.9		6.6
Approach LOS		C		B		B		A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56.1	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 13.4	Intersection LOS: B
Intersection Capacity Utilization 79.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 10: Cedar Avenue S & E 31st Street



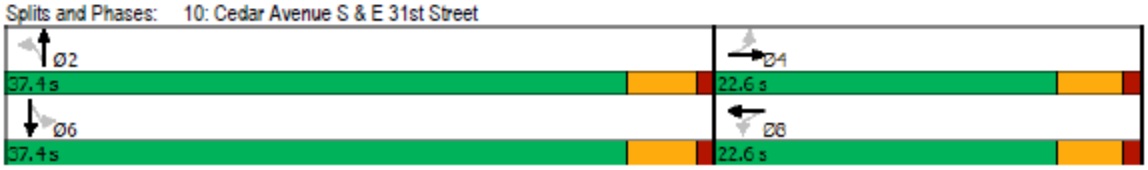
Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 31st St

Timings
Cedar Avenue - Build AM Peak 11/21/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	35	117	29	64	39	725	8	372
Future Volume (vph)	35	117	29	64	39	725	8	372
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.6	22.6	22.6	22.6	37.4	37.4	37.4	37.4
Total Split (%)	37.7%	37.7%	37.7%	37.7%	62.3%	62.3%	62.3%	62.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)		11.2		11.2	35.8	35.8	35.8	35.8
Actuated g/C Ratio		0.20		0.20	0.64	0.64	0.64	0.64
v/c Ratio		0.56		0.37	0.07	0.68	0.03	0.38
Control Delay		23.9		18.1	5.4	11.5	5.4	6.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		23.9		18.1	5.4	11.5	5.4	6.5
LOS		C		B	A	B	A	A
Approach Delay		23.9		18.1		11.2		6.5
Approach LOS		C		B		B		A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 12.0	Intersection LOS: B
Intersection Capacity Utilization 58.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 10: Cedar Avenue S & E 31st Street



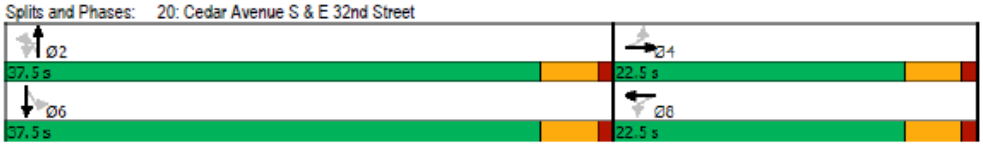
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 32nd St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBU	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	16	33	37	39	1	7	674	27	397
Future Volume (vph)	16	33	37	39	1	7	674	27	397
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		4		8			2		6
Permitted Phases	4		8		2	2		6	
Detector Phase	4	4	8	8	2	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0			0.0		0.0
Total Lost Time (s)		4.5		4.5			4.5		4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		8.3		8.3			38.3		38.3
Actuated g/C Ratio		0.16		0.16			0.73		0.73
v/c Ratio		0.26		0.45			0.60		0.37
Control Delay		17.0		18.9			7.7		5.2
Queue Delay		0.0		0.0			0.0		0.0
Total Delay		17.0		18.9			7.7		5.2
LOS		B		B			A		A
Approach Delay		17.0		18.9			7.7		5.2
Approach LOS		B		B			A		A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 8.3	Intersection LOS: A
Intersection Capacity Utilization 58.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 20: Cedar Avenue S & E 32nd Street



Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 32nd St

County staff is proposing to remove the existing traffic signal at the CSAH 152 and E 32nd St intersection (pending further evaluation and local approval). Therefore, there are no signal timing plans for the proposed conditions.

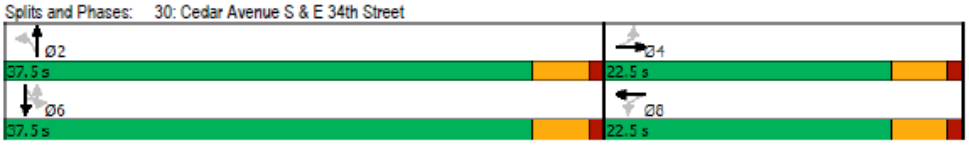
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 34th St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBU	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	7	8	21	6	8	677	4	11	417
Future Volume (vph)	7	8	21	6	8	677	4	11	417
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		2			6
Permitted Phases	4		8		2		6	6	
Detector Phase	4	4	8	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0		0.0			0.0
Total Lost Time (s)		4.5		4.5		4.5			4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		6.6		6.7		45.7			45.7
Actuated g/C Ratio		0.13		0.13		0.87			0.87
v/c Ratio		0.14		0.23		0.48			0.31
Control Delay		16.1		16.4		4.1			2.9
Queue Delay		0.0		0.0		0.0			0.0
Total Delay		16.1		16.4		4.1			2.9
LOS		B		B		A			A
Approach Delay		16.1		16.4		4.1			2.9
Approach LOS		B		B		A			A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.5	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.48	
Intersection Signal Delay: 4.4	Intersection LOS: A
Intersection Capacity Utilization 52.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 30: Cedar Avenue S & E 34th Street



Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 34th St

County staff is proposing to remove the existing traffic signal at the CSAH 152 and E 34th St intersection (pending further evaluation and local approval). Therefore, there are no signal timing plans for the proposed conditions.

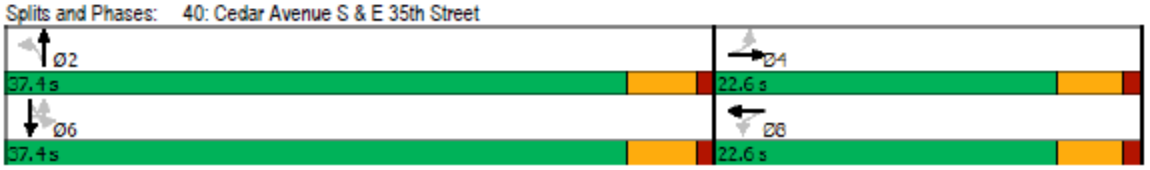
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 35th St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBU	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	26	115	66	141	34	675	1	32	376
Future Volume (vph)	26	115	66	141	34	675	1	32	376
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		2			6
Permitted Phases	4		8		2		6	6	
Detector Phase	4	4	8	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.6	22.6	22.6	22.6	37.4	37.4	37.4	37.4	37.4
Total Split (%)	37.7%	37.7%	37.7%	37.7%	62.3%	62.3%	62.3%	62.3%	62.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5		4.5	4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		13.0		13.0	33.9	33.9		33.9	33.9
Actuated g/C Ratio		0.23		0.23	0.61	0.61		0.61	0.61
v/c Ratio		0.43		0.65	0.07	0.71		0.14	0.40
Control Delay		19.7		27.0	6.2	13.5		7.8	7.7
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0
Total Delay		19.7		27.0	6.2	13.5		7.8	7.7
LOS		B		C	A	B		A	A
Approach Delay		19.7		27.0		13.1			7.7
Approach LOS		B		C		B			A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 67.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 40: Cedar Avenue S & E 35th Street



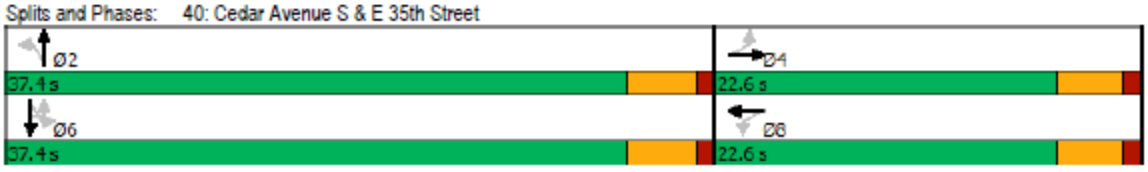
Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 35th St

Timings
Cedar Avenue - Build AM Peak 11/21/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBU	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	26	115	66	141	34	675	1	32	376
Future Volume (vph)	26	115	66	141	34	675	1	32	376
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		2			6
Permitted Phases	4		8		2		6	6	
Detector Phase	4	4	8	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.6	22.6	22.6	22.6	37.4	37.4	37.4	37.4	37.4
Total Split (%)	37.7%	37.7%	37.7%	37.7%	62.3%	62.3%	62.3%	62.3%	62.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5		4.5	4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		13.0		13.0	33.9	33.9		33.9	33.9
Actuated g/C Ratio		0.23		0.23	0.61	0.61		0.61	0.61
v/c Ratio		0.43		0.65	0.07	0.71		0.14	0.40
Control Delay		19.7		27.0	6.2	13.5		7.8	7.7
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0
Total Delay		19.7		27.0	6.2	13.5		7.8	7.7
LOS		B		C	A	B		A	A
Approach Delay		19.7		27.0		13.1			7.7
Approach LOS		B		C		B			A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 67.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 40: Cedar Avenue S & E 35th Street



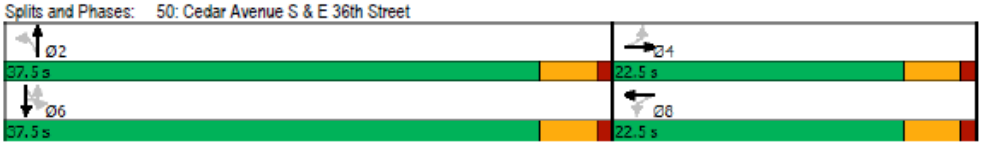
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 36th St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBU	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	24	33	18	20	17	686	3	30	387
Future Volume (vph)	24	33	18	20	17	686	3	30	387
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		2			6
Permitted Phases	4		8		2		6	6	
Detector Phase	4	4	8	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0		0.0			0.0
Total Lost Time (s)		4.5		4.5		4.5			4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		7.5		7.4		41.6			41.6
Actuated g/C Ratio		0.14		0.14		0.80			0.80
v/c Ratio		0.32		0.25		0.53			0.35
Control Delay		20.3		17.3		5.9			4.2
Queue Delay		0.0		0.0		0.0			0.0
Total Delay		20.3		17.3		5.9			4.2
LOS		C		B		A			A
Approach Delay		20.3		17.3		5.9			4.2
Approach LOS		C		B		A			A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.2	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 6.5	Intersection LOS: A
Intersection Capacity Utilization 53.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 50: Cedar Avenue S & E 36th Street



Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 36th St

County staff is proposing to remove the existing traffic signal at the CSAH 152 and E 36th St intersection (pending further evaluation and local approval). Therefore, there are no signal timing plans for the proposed conditions.

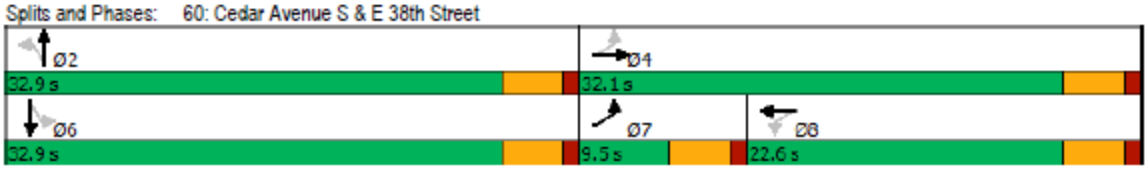
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 38th St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	70	177	67	163	23	594	32	327
Future Volume (vph)	70	177	67	163	23	594	32	327
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	7	4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.5	32.1	22.6	22.6	32.9	32.9	32.9	32.9
Total Split (%)	14.6%	49.4%	34.8%	34.8%	50.6%	50.6%	50.6%	50.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead		Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes				
Recall Mode	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)		15.0		15.0	28.6	28.6	28.6	28.6
Actuated g/C Ratio		0.28		0.28	0.54	0.54	0.54	0.54
v/c Ratio		0.66		0.65	0.05	0.70	0.14	0.40
Control Delay		23.5		22.8	8.0	15.8	9.8	9.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		23.5		22.8	8.0	15.8	9.8	9.5
LOS		C		C	A	B	A	A
Approach Delay		23.5		22.8		15.5		9.5
Approach LOS		C		C		B		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 52.7	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 16.6	Intersection LOS: B
Intersection Capacity Utilization 61.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 60: Cedar Avenue S & E 38th Street



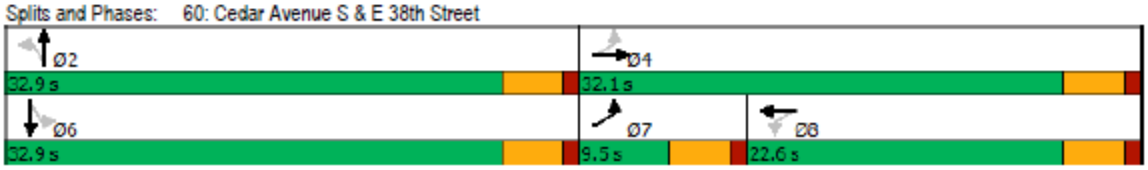
Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 38th St

Timings
Cedar Avenue - Build AM Peak 11/21/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	70	177	67	163	23	594	32	327
Future Volume (vph)	70	177	67	163	23	594	32	327
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	7	4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.5	32.1	22.6	22.6	32.9	32.9	32.9	32.9
Total Split (%)	14.6%	49.4%	34.8%	34.8%	50.6%	50.6%	50.6%	50.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead		Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes				
Recall Mode	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)		15.0		15.0	28.6	28.6	28.6	28.6
Actuated g/C Ratio		0.28		0.28	0.54	0.54	0.54	0.54
v/c Ratio		0.66		0.65	0.05	0.70	0.14	0.40
Control Delay		23.5		22.8	8.0	15.8	9.8	9.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		23.5		22.8	8.0	15.8	9.8	9.5
LOS		C		C	A	B	A	A
Approach Delay		23.5		22.8		15.5		9.5
Approach LOS		C		C		B		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 52.7	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 16.6	Intersection LOS: B
Intersection Capacity Utilization 61.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 60: Cedar Avenue S & E 38th Street



Synchro Report for existing conditions (AM Peak) CSAH 152 & E 40th St

The existing and proposed conditions at the CSAH 152 (Cedar Ave) and 40th St intersection were not evaluated as part of the Synchro Analysis as a right-in/right-out condition was introduced circa 2014 that significantly impacted travel patterns.

Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 40th St

County staff is proposing to remove the existing traffic signal at the CSAH 152 and 40th St intersection (pending further evaluation and local approval). Therefore, there are no signal timing plans for the proposed conditions.

CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Synchro Report – Congestion Reduction

Existing conditions (AM Peak)

10: Cedar Avenue S & E 31st Street

Direction	All
Future Volume (vph)	1497
Total Delay / Veh (s/v)	13
CO Emissions (kg)	1.46
NOx Emissions (kg)	0.28
VOC Emissions (kg)	0.34

Proposed conditions (AM Peak)

10: Cedar Avenue S & E 31st Street

Direction	All
Future Volume (vph)	1496
Total Delay / Veh (s/v)	12
CO Emissions (kg)	1.42
NOx Emissions (kg)	0.28
VOC Emissions (kg)	0.33

Existing conditions (AM Peak)

20: Cedar Avenue S & E 32nd Street

Direction	All
Future Volume (vph)	1346
Total Delay / Veh (s/v)	8
CO Emissions (kg)	1.20
NOx Emissions (kg)	0.23
VOC Emissions (kg)	0.28

Proposed conditions (AM Peak)

20: Cedar Avenue S & E 32nd Street

Direction	All
Future Volume (vph)	1346
Total Delay / Veh (s/v)	10
CO Emissions (kg)	1.08
NOx Emissions (kg)	0.21
VOC Emissions (kg)	0.25

Existing conditions (AM Peak)

30: Cedar Avenue S & E 34th Street

Direction	All
Future Volume (vph)	1240
Total Delay / Veh (s/v)	4
CO Emissions (kg)	0.84
NOx Emissions (kg)	0.16
VOC Emissions (kg)	0.19

Proposed conditions (AM Peak)

30: Cedar Avenue S & E 34th Street

Direction	All
Future Volume (vph)	1240
Total Delay / Veh (s/v)	2
CO Emissions (kg)	0.71
NOx Emissions (kg)	0.14
VOC Emissions (kg)	0.16

Existing conditions (AM Peak)

40: Cedar Avenue S & E 35th Street

Direction	All
Future Volume (vph)	1596
Total Delay / Veh (s/v)	14
CO Emissions (kg)	1.41
NOx Emissions (kg)	0.27
VOC Emissions (kg)	0.33

Proposed conditions (AM Peak)

40: Cedar Avenue S & E 35th Street

Direction	All
Future Volume (vph)	1596
Total Delay / Veh (s/v)	14
CO Emissions (kg)	1.41
NOx Emissions (kg)	0.27
VOC Emissions (kg)	0.33

Existing conditions (AM Peak)

50: Cedar Avenue S & E 36th Street

Direction	All
Future Volume (vph)	1281
Total Delay / Veh (s/v)	7
CO Emissions (kg)	1.08
NOx Emissions (kg)	0.21
VOC Emissions (kg)	0.25

Proposed conditions (AM Peak)

50: Cedar Avenue S & E 36th Street

Direction	All
Future Volume (vph)	1281
Total Delay / Veh (s/v)	4
CO Emissions (kg)	0.94
NOx Emissions (kg)	0.18
VOC Emissions (kg)	0.22

Existing conditions (AM Peak)

60: Cedar Avenue S & E 38th Street

Direction	All
Future Volume (vph)	1614
Total Delay / Veh (s/v)	17
CO Emissions (kg)	2.41
NOx Emissions (kg)	0.47
VOC Emissions (kg)	0.56

Proposed conditions (AM Peak)

60: Cedar Avenue S & E 38th Street

Direction	All
Future Volume (vph)	1614
Total Delay / Veh (s/v)	17
CO Emissions (kg)	2.41
NOx Emissions (kg)	0.47
VOC Emissions (kg)	0.56

The existing and proposed conditions at the CSAH 152 (Cedar Ave) and 40th St intersection were not evaluated as part of the Synchro Analysis as a right-in/right-out condition was introduced circa 2014 that significantly impacted travel patterns.

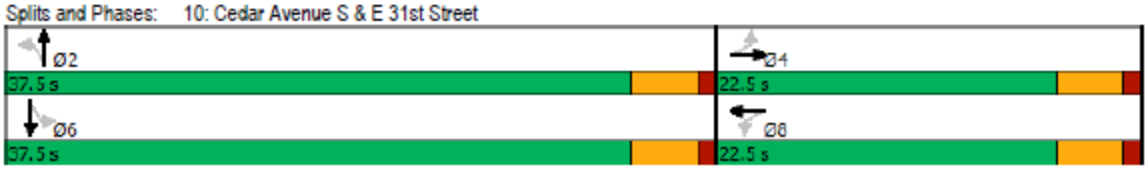
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 31st St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	35	117	29	64	39	725	8	372
Future Volume (vph)	35	117	29	64	39	725	8	372
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0		0.0		0.0
Total Lost Time (s)		4.5		4.5		4.5		4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)		11.2		11.2		35.9		35.9
Actuated g/C Ratio		0.20		0.20		0.64		0.64
v/c Ratio		0.56		0.37		0.74		0.39
Control Delay		23.9		18.2		13.9		6.6
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		23.9		18.2		13.9		6.6
LOS		C		B		B		A
Approach Delay		23.9		18.2		13.9		6.6
Approach LOS		C		B		B		A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56.1	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 13.4	Intersection LOS: B
Intersection Capacity Utilization 79.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 10: Cedar Avenue S & E 31st Street



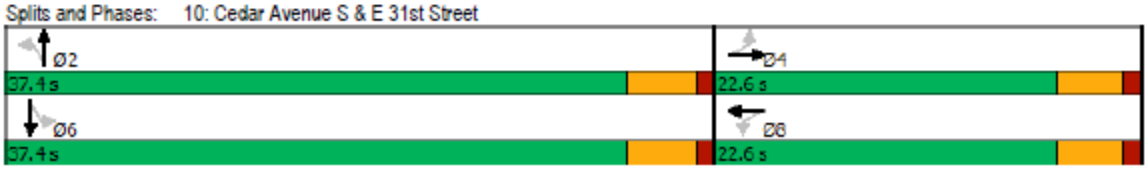
Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 31st St

Timings
Cedar Avenue - Build AM Peak 11/21/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	35	117	29	64	39	725	8	372
Future Volume (vph)	35	117	29	64	39	725	8	372
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.6	22.6	22.6	22.6	37.4	37.4	37.4	37.4
Total Split (%)	37.7%	37.7%	37.7%	37.7%	62.3%	62.3%	62.3%	62.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)		11.2		11.2	35.8	35.8	35.8	35.8
Actuated g/C Ratio		0.20		0.20	0.64	0.64	0.64	0.64
v/c Ratio		0.56		0.37	0.07	0.68	0.03	0.38
Control Delay		23.9		18.1	5.4	11.5	5.4	6.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		23.9		18.1	5.4	11.5	5.4	6.5
LOS		C		B	A	B	A	A
Approach Delay		23.9		18.1		11.2		6.5
Approach LOS		C		B		B		A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 12.0	Intersection LOS: B
Intersection Capacity Utilization 58.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 10: Cedar Avenue S & E 31st Street



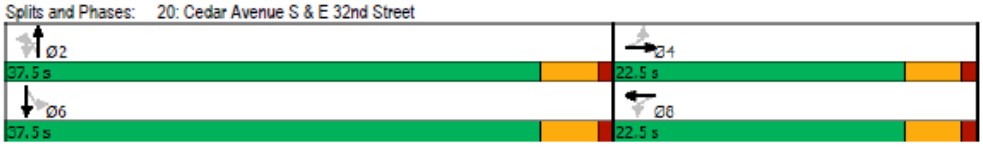
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 32nd St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBU	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	16	33	37	39	1	7	674	27	397
Future Volume (vph)	16	33	37	39	1	7	674	27	397
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		4		8			2		6
Permitted Phases	4		8		2	2		6	
Detector Phase	4	4	8	8	2	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0			0.0		0.0
Total Lost Time (s)		4.5		4.5			4.5		4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		8.3		8.3			38.3		38.3
Actuated g/C Ratio		0.16		0.16			0.73		0.73
v/c Ratio		0.26		0.45			0.60		0.37
Control Delay		17.0		18.9			7.7		5.2
Queue Delay		0.0		0.0			0.0		0.0
Total Delay		17.0		18.9			7.7		5.2
LOS		B		B			A		A
Approach Delay		17.0		18.9			7.7		5.2
Approach LOS		B		B			A		A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 8.3	Intersection LOS: A
Intersection Capacity Utilization 58.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 20: Cedar Avenue S & E 32nd Street



Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 32nd St

County staff is proposing to remove the existing traffic signal at the CSAH 152 and E 32nd St intersection (pending further evaluation and local approval). Therefore, there are no signal timing plans for the proposed conditions.

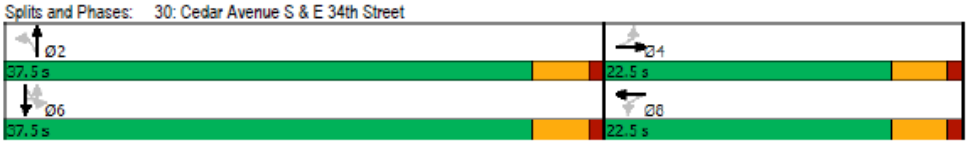
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 34th St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBU	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	7	8	21	6	8	677	4	11	417
Future Volume (vph)	7	8	21	6	8	677	4	11	417
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		2			6
Permitted Phases	4		8		2		6	6	
Detector Phase	4	4	8	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0		0.0			0.0
Total Lost Time (s)		4.5		4.5		4.5			4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		6.6		6.7		45.7			45.7
Actuated g/C Ratio		0.13		0.13		0.87			0.87
v/c Ratio		0.14		0.23		0.48			0.31
Control Delay		16.1		16.4		4.1			2.9
Queue Delay		0.0		0.0		0.0			0.0
Total Delay		16.1		16.4		4.1			2.9
LOS		B		B		A			A
Approach Delay		16.1		16.4		4.1			2.9
Approach LOS		B		B		A			A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.5	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.48	
Intersection Signal Delay: 4.4	Intersection LOS: A
Intersection Capacity Utilization 52.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 30: Cedar Avenue S & E 34th Street



Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 34th St

County staff is proposing to remove the existing traffic signal at the CSAH 152 and E 34th St intersection (pending further evaluation and local approval). Therefore, there are no signal timing plans for the proposed conditions.

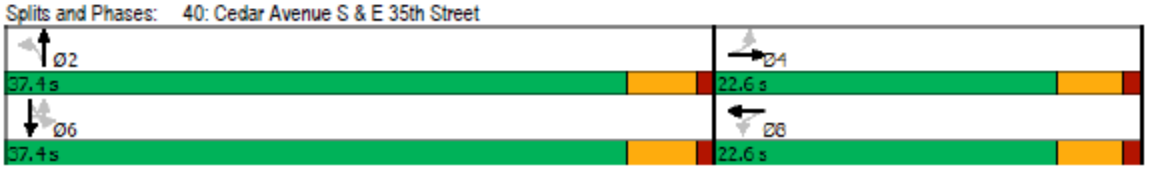
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 35th St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBU	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	26	115	66	141	34	675	1	32	376
Future Volume (vph)	26	115	66	141	34	675	1	32	376
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		2			6
Permitted Phases	4		8		2		6	6	
Detector Phase	4	4	8	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.6	22.6	22.6	22.6	37.4	37.4	37.4	37.4	37.4
Total Split (%)	37.7%	37.7%	37.7%	37.7%	62.3%	62.3%	62.3%	62.3%	62.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5		4.5	4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		13.0		13.0	33.9	33.9		33.9	33.9
Actuated g/C Ratio		0.23		0.23	0.61	0.61		0.61	0.61
v/c Ratio		0.43		0.65	0.07	0.71		0.14	0.40
Control Delay		19.7		27.0	6.2	13.5		7.8	7.7
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0
Total Delay		19.7		27.0	6.2	13.5		7.8	7.7
LOS		B		C	A	B		A	A
Approach Delay		19.7		27.0		13.1			7.7
Approach LOS		B		C		B			A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 67.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 40: Cedar Avenue S & E 35th Street



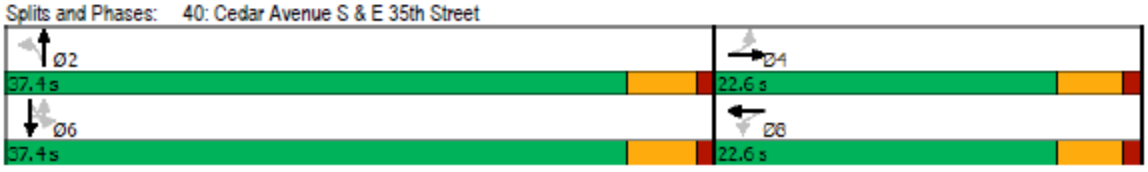
Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 35th St

Timings
Cedar Avenue - Build AM Peak 11/21/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBU	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	26	115	66	141	34	675	1	32	376
Future Volume (vph)	26	115	66	141	34	675	1	32	376
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		2			6
Permitted Phases	4		8		2		6	6	
Detector Phase	4	4	8	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.6	22.6	22.6	22.6	37.4	37.4	37.4	37.4	37.4
Total Split (%)	37.7%	37.7%	37.7%	37.7%	62.3%	62.3%	62.3%	62.3%	62.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5		4.5	4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		13.0		13.0	33.9	33.9		33.9	33.9
Actuated g/C Ratio		0.23		0.23	0.61	0.61		0.61	0.61
v/c Ratio		0.43		0.65	0.07	0.71		0.14	0.40
Control Delay		19.7		27.0	6.2	13.5		7.8	7.7
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0
Total Delay		19.7		27.0	6.2	13.5		7.8	7.7
LOS		B		C	A	B		A	A
Approach Delay		19.7		27.0		13.1			7.7
Approach LOS		B		C		B			A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 67.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 40: Cedar Avenue S & E 35th Street



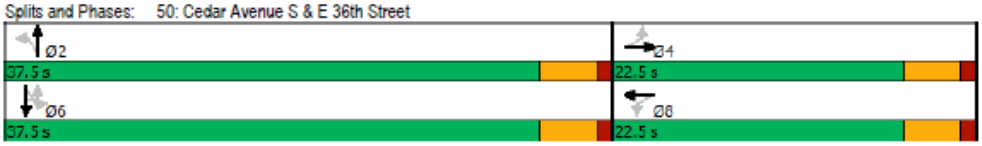
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 36th St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBU	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	24	33	18	20	17	686	3	30	387
Future Volume (vph)	24	33	18	20	17	686	3	30	387
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		2			6
Permitted Phases	4		8		2		6	6	
Detector Phase	4	4	8	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0		0.0			0.0
Total Lost Time (s)		4.5		4.5		4.5			4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		7.5		7.4		41.6			41.6
Actuated g/C Ratio		0.14		0.14		0.80			0.80
v/c Ratio		0.32		0.25		0.53			0.35
Control Delay		20.3		17.3		5.9			4.2
Queue Delay		0.0		0.0		0.0			0.0
Total Delay		20.3		17.3		5.9			4.2
LOS		C		B		A			A
Approach Delay		20.3		17.3		5.9			4.2
Approach LOS		C		B		A			A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.2	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 6.5	Intersection LOS: A
Intersection Capacity Utilization 53.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 50: Cedar Avenue S & E 36th Street



Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 36th St

County staff is proposing to remove the existing traffic signal at the CSAH 152 and E 36th St intersection (pending further evaluation and local approval). Therefore, there are no signal timing plans for the proposed conditions.

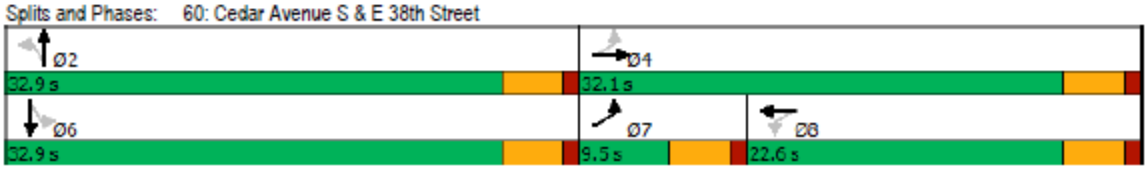
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 38th St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	70	177	67	163	23	594	32	327
Future Volume (vph)	70	177	67	163	23	594	32	327
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	7	4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.5	32.1	22.6	22.6	32.9	32.9	32.9	32.9
Total Split (%)	14.6%	49.4%	34.8%	34.8%	50.6%	50.6%	50.6%	50.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead		Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes				
Recall Mode	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)		15.0		15.0	28.6	28.6	28.6	28.6
Actuated g/C Ratio		0.28		0.28	0.54	0.54	0.54	0.54
v/c Ratio		0.66		0.65	0.05	0.70	0.14	0.40
Control Delay		23.5		22.8	8.0	15.8	9.8	9.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		23.5		22.8	8.0	15.8	9.8	9.5
LOS		C		C	A	B	A	A
Approach Delay		23.5		22.8		15.5		9.5
Approach LOS		C		C		B		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 52.7	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 16.6	Intersection LOS: B
Intersection Capacity Utilization 61.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 60: Cedar Avenue S & E 38th Street



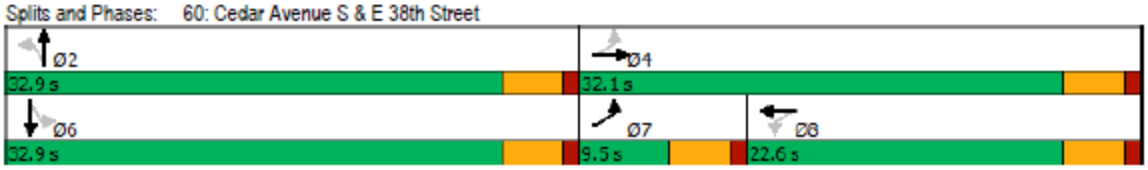
Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 38th St

Timings
Cedar Avenue - Build AM Peak 11/21/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	70	177	67	163	23	594	32	327
Future Volume (vph)	70	177	67	163	23	594	32	327
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	7	4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.5	32.1	22.6	22.6	32.9	32.9	32.9	32.9
Total Split (%)	14.6%	49.4%	34.8%	34.8%	50.6%	50.6%	50.6%	50.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead		Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes				
Recall Mode	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)		15.0		15.0	28.6	28.6	28.6	28.6
Actuated g/C Ratio		0.28		0.28	0.54	0.54	0.54	0.54
v/c Ratio		0.66		0.65	0.05	0.70	0.14	0.40
Control Delay		23.5		22.8	8.0	15.8	9.8	9.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		23.5		22.8	8.0	15.8	9.8	9.5
LOS		C		C	A	B	A	A
Approach Delay		23.5		22.8		15.5		9.5
Approach LOS		C		C		B		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 52.7	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 16.6	Intersection LOS: B
Intersection Capacity Utilization 61.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 60: Cedar Avenue S & E 38th Street



Synchro Report for existing conditions (AM Peak) CSAH 152 & E 40th St

The existing and proposed conditions at the CSAH 152 (Cedar Ave) and 40th St intersection were not evaluated as part of the Synchro Analysis as a right-in/right-out condition was introduced circa 2014 that significantly impacted travel patterns.

Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 40th St

County staff is proposing to remove the existing traffic signal at the CSAH 152 and 40th St intersection (pending further evaluation and local approval). Therefore, there are no signal timing plans for the proposed conditions.

CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Synchro Report – Congestion Reduction

Existing conditions (AM Peak)

10: Cedar Avenue S & E 31st Street

Direction	All
Future Volume (vph)	1497
Total Delay / Veh (s/v)	13
CO Emissions (kg)	1.46
NOx Emissions (kg)	0.28
VOC Emissions (kg)	0.34

Proposed conditions (AM Peak)

10: Cedar Avenue S & E 31st Street

Direction	All
Future Volume (vph)	1496
Total Delay / Veh (s/v)	12
CO Emissions (kg)	1.42
NOx Emissions (kg)	0.28
VOC Emissions (kg)	0.33

Existing conditions (AM Peak)

20: Cedar Avenue S & E 32nd Street

Direction	All
Future Volume (vph)	1346
Total Delay / Veh (s/v)	8
CO Emissions (kg)	1.20
NOx Emissions (kg)	0.23
VOC Emissions (kg)	0.28

Proposed conditions (AM Peak)

20: Cedar Avenue S & E 32nd Street

Direction	All
Future Volume (vph)	1346
Total Delay / Veh (s/v)	10
CO Emissions (kg)	1.08
NOx Emissions (kg)	0.21
VOC Emissions (kg)	0.25

Existing conditions (AM Peak)

30: Cedar Avenue S & E 34th Street

Direction	All
Future Volume (vph)	1240
Total Delay / Veh (s/v)	4
CO Emissions (kg)	0.84
NOx Emissions (kg)	0.16
VOC Emissions (kg)	0.19

Proposed conditions (AM Peak)

30: Cedar Avenue S & E 34th Street

Direction	All
Future Volume (vph)	1240
Total Delay / Veh (s/v)	2
CO Emissions (kg)	0.71
NOx Emissions (kg)	0.14
VOC Emissions (kg)	0.16

Existing conditions (AM Peak)

40: Cedar Avenue S & E 35th Street

Direction	All
Future Volume (vph)	1596
Total Delay / Veh (s/v)	14
CO Emissions (kg)	1.41
NOx Emissions (kg)	0.27
VOC Emissions (kg)	0.33

Proposed conditions (AM Peak)

40: Cedar Avenue S & E 35th Street

Direction	All
Future Volume (vph)	1596
Total Delay / Veh (s/v)	14
CO Emissions (kg)	1.41
NOx Emissions (kg)	0.27
VOC Emissions (kg)	0.33

Existing conditions (AM Peak)

50: Cedar Avenue S & E 36th Street

Direction	All
Future Volume (vph)	1281
Total Delay / Veh (s/v)	7
CO Emissions (kg)	1.08
NOx Emissions (kg)	0.21
VOC Emissions (kg)	0.25

Proposed conditions (AM Peak)

50: Cedar Avenue S & E 36th Street

Direction	All
Future Volume (vph)	1281
Total Delay / Veh (s/v)	4
CO Emissions (kg)	0.94
NOx Emissions (kg)	0.18
VOC Emissions (kg)	0.22

Existing conditions (AM Peak)

60: Cedar Avenue S & E 38th Street

Direction	All
Future Volume (vph)	1614
Total Delay / Veh (s/v)	17
CO Emissions (kg)	2.41
NOx Emissions (kg)	0.47
VOC Emissions (kg)	0.56

Proposed conditions (AM Peak)

60: Cedar Avenue S & E 38th Street

Direction	All
Future Volume (vph)	1614
Total Delay / Veh (s/v)	17
CO Emissions (kg)	2.41
NOx Emissions (kg)	0.47
VOC Emissions (kg)	0.56

The existing and proposed conditions at the CSAH 152 (Cedar Ave) and 40th St intersection were not evaluated as part of the Synchro Analysis as a right-in/right-out condition was introduced circa 2014 that significantly impacted travel patterns.

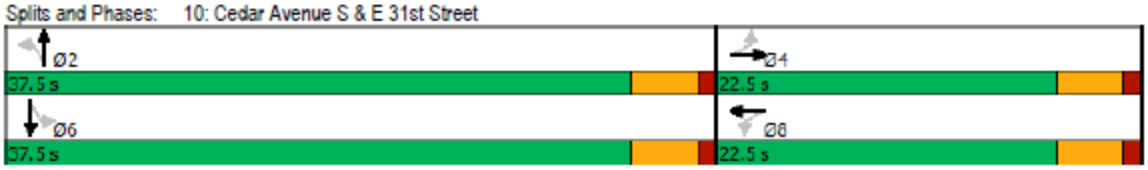
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 31st St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	35	117	29	64	39	725	8	372
Future Volume (vph)	35	117	29	64	39	725	8	372
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0		0.0		0.0
Total Lost Time (s)		4.5		4.5		4.5		4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)		11.2		11.2		35.9		35.9
Actuated g/C Ratio		0.20		0.20		0.64		0.64
v/c Ratio		0.56		0.37		0.74		0.39
Control Delay		23.9		18.2		13.9		6.6
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		23.9		18.2		13.9		6.6
LOS		C		B		B		A
Approach Delay		23.9		18.2		13.9		6.6
Approach LOS		C		B		B		A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56.1	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 13.4	Intersection LOS: B
Intersection Capacity Utilization 79.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 10: Cedar Avenue S & E 31st Street



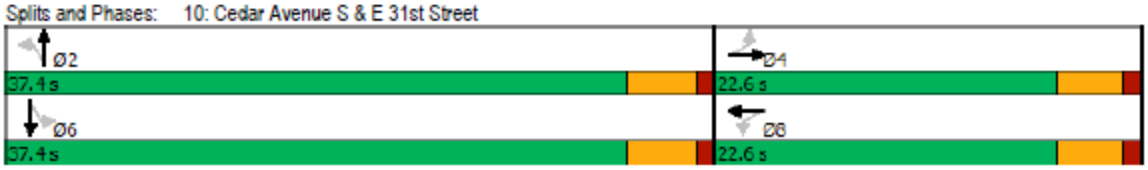
Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 31st St

Timings
Cedar Avenue - Build AM Peak 11/21/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	35	117	29	64	39	725	8	372
Future Volume (vph)	35	117	29	64	39	725	8	372
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.6	22.6	22.6	22.6	37.4	37.4	37.4	37.4
Total Split (%)	37.7%	37.7%	37.7%	37.7%	62.3%	62.3%	62.3%	62.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)		11.2		11.2	35.8	35.8	35.8	35.8
Actuated g/C Ratio		0.20		0.20	0.64	0.64	0.64	0.64
v/c Ratio		0.56		0.37	0.07	0.68	0.03	0.38
Control Delay		23.9		18.1	5.4	11.5	5.4	6.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		23.9		18.1	5.4	11.5	5.4	6.5
LOS		C		B	A	B	A	A
Approach Delay		23.9		18.1		11.2		6.5
Approach LOS		C		B		B		A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 12.0	Intersection LOS: B
Intersection Capacity Utilization 58.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 10: Cedar Avenue S & E 31st Street



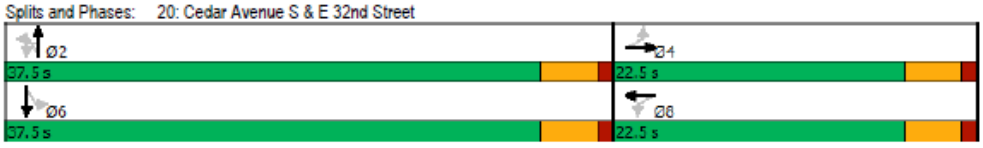
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 32nd St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBU	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	16	33	37	39	1	7	674	27	397
Future Volume (vph)	16	33	37	39	1	7	674	27	397
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		4		8			2		6
Permitted Phases	4		8		2	2		6	
Detector Phase	4	4	8	8	2	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0			0.0		0.0
Total Lost Time (s)		4.5		4.5			4.5		4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		8.3		8.3			38.3		38.3
Actuated g/C Ratio		0.16		0.16			0.73		0.73
v/c Ratio		0.26		0.45			0.60		0.37
Control Delay		17.0		18.9			7.7		5.2
Queue Delay		0.0		0.0			0.0		0.0
Total Delay		17.0		18.9			7.7		5.2
LOS		B		B			A		A
Approach Delay		17.0		18.9			7.7		5.2
Approach LOS		B		B			A		A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 8.3	Intersection LOS: A
Intersection Capacity Utilization 58.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 20: Cedar Avenue S & E 32nd Street



Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 32nd St

County staff is proposing to remove the existing traffic signal at the CSAH 152 and E 32nd St intersection (pending further evaluation and local approval). Therefore, there are no signal timing plans for the proposed conditions.

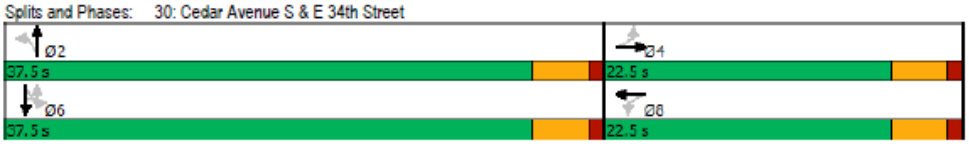
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 34th St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBU	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	7	8	21	6	8	677	4	11	417
Future Volume (vph)	7	8	21	6	8	677	4	11	417
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		2			6
Permitted Phases	4		8		2		6	6	
Detector Phase	4	4	8	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0		0.0			0.0
Total Lost Time (s)		4.5		4.5		4.5			4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		6.6		6.7		45.7			45.7
Actuated g/C Ratio		0.13		0.13		0.87			0.87
v/c Ratio		0.14		0.23		0.48			0.31
Control Delay		16.1		16.4		4.1			2.9
Queue Delay		0.0		0.0		0.0			0.0
Total Delay		16.1		16.4		4.1			2.9
LOS		B		B		A			A
Approach Delay		16.1		16.4		4.1			2.9
Approach LOS		B		B		A			A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.5	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.48	
Intersection Signal Delay: 4.4	Intersection LOS: A
Intersection Capacity Utilization 52.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 30: Cedar Avenue S & E 34th Street



Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 34th St

County staff is proposing to remove the existing traffic signal at the CSAH 152 and E 34th St intersection (pending further evaluation and local approval). Therefore, there are no signal timing plans for the proposed conditions.

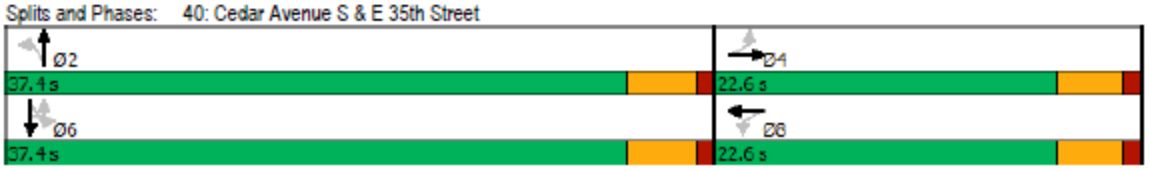
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 35th St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBU	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	26	115	66	141	34	675	1	32	376
Future Volume (vph)	26	115	66	141	34	675	1	32	376
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		2			6
Permitted Phases	4		8		2		6	6	
Detector Phase	4	4	8	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.6	22.6	22.6	22.6	37.4	37.4	37.4	37.4	37.4
Total Split (%)	37.7%	37.7%	37.7%	37.7%	62.3%	62.3%	62.3%	62.3%	62.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5		4.5	4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		13.0		13.0	33.9	33.9		33.9	33.9
Actuated g/C Ratio		0.23		0.23	0.61	0.61		0.61	0.61
v/c Ratio		0.43		0.65	0.07	0.71		0.14	0.40
Control Delay		19.7		27.0	6.2	13.5		7.8	7.7
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0
Total Delay		19.7		27.0	6.2	13.5		7.8	7.7
LOS		B		C	A	B		A	A
Approach Delay		19.7		27.0		13.1			7.7
Approach LOS		B		C		B			A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 67.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 40: Cedar Avenue S & E 35th Street



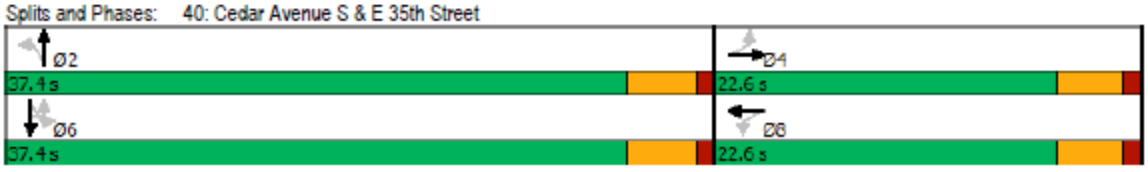
Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 35th St

Timings
Cedar Avenue - Build AM Peak 11/21/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBU	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	26	115	66	141	34	675	1	32	376
Future Volume (vph)	26	115	66	141	34	675	1	32	376
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		2			6
Permitted Phases	4		8		2		6	6	
Detector Phase	4	4	8	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.6	22.6	22.6	22.6	37.4	37.4	37.4	37.4	37.4
Total Split (%)	37.7%	37.7%	37.7%	37.7%	62.3%	62.3%	62.3%	62.3%	62.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5		4.5	4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		13.0		13.0	33.9	33.9		33.9	33.9
Actuated g/C Ratio		0.23		0.23	0.61	0.61		0.61	0.61
v/c Ratio		0.43		0.65	0.07	0.71		0.14	0.40
Control Delay		19.7		27.0	6.2	13.5		7.8	7.7
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0
Total Delay		19.7		27.0	6.2	13.5		7.8	7.7
LOS		B		C	A	B		A	A
Approach Delay		19.7		27.0		13.1			7.7
Approach LOS		B		C		B			A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 67.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 40: Cedar Avenue S & E 35th Street



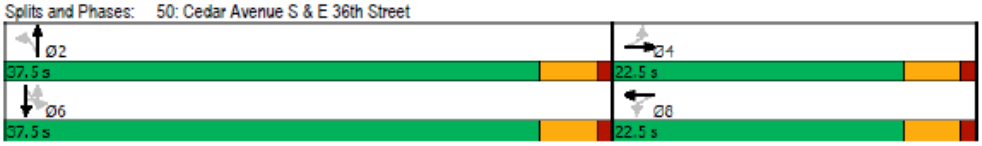
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 36th St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBU	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	24	33	18	20	17	686	3	30	387
Future Volume (vph)	24	33	18	20	17	686	3	30	387
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		2			6
Permitted Phases	4		8		2		6	6	
Detector Phase	4	4	8	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0		0.0			0.0
Total Lost Time (s)		4.5		4.5		4.5			4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		7.5		7.4		41.6			41.6
Actuated g/C Ratio		0.14		0.14		0.80			0.80
v/c Ratio		0.32		0.25		0.53			0.35
Control Delay		20.3		17.3		5.9			4.2
Queue Delay		0.0		0.0		0.0			0.0
Total Delay		20.3		17.3		5.9			4.2
LOS		C		B		A			A
Approach Delay		20.3		17.3		5.9			4.2
Approach LOS		C		B		A			A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.2	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 6.5	Intersection LOS: A
Intersection Capacity Utilization 53.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 50: Cedar Avenue S & E 36th Street



Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 36th St

County staff is proposing to remove the existing traffic signal at the CSAH 152 and E 36th St intersection (pending further evaluation and local approval). Therefore, there are no signal timing plans for the proposed conditions.

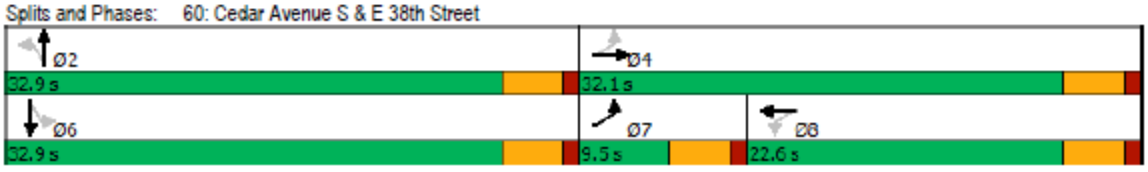
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 38th St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	70	177	67	163	23	594	32	327
Future Volume (vph)	70	177	67	163	23	594	32	327
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	7	4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.5	32.1	22.6	22.6	32.9	32.9	32.9	32.9
Total Split (%)	14.6%	49.4%	34.8%	34.8%	50.6%	50.6%	50.6%	50.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead		Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes				
Recall Mode	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)		15.0		15.0	28.6	28.6	28.6	28.6
Actuated g/C Ratio		0.28		0.28	0.54	0.54	0.54	0.54
v/c Ratio		0.66		0.65	0.05	0.70	0.14	0.40
Control Delay		23.5		22.8	8.0	15.8	9.8	9.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		23.5		22.8	8.0	15.8	9.8	9.5
LOS		C		C	A	B	A	A
Approach Delay		23.5		22.8		15.5		9.5
Approach LOS		C		C		B		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 52.7	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 16.6	Intersection LOS: B
Intersection Capacity Utilization 61.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 60: Cedar Avenue S & E 38th Street



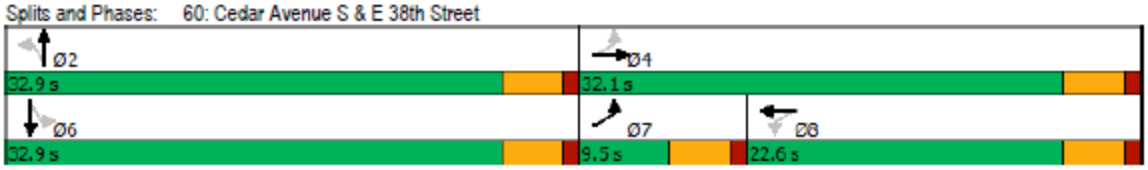
Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 38th St

Timings
Cedar Avenue - Build AM Peak 11/21/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	70	177	67	163	23	594	32	327
Future Volume (vph)	70	177	67	163	23	594	32	327
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	7	4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.5	32.1	22.6	22.6	32.9	32.9	32.9	32.9
Total Split (%)	14.6%	49.4%	34.8%	34.8%	50.6%	50.6%	50.6%	50.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead		Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes				
Recall Mode	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)		15.0		15.0	28.6	28.6	28.6	28.6
Actuated g/C Ratio		0.28		0.28	0.54	0.54	0.54	0.54
v/c Ratio		0.66		0.65	0.05	0.70	0.14	0.40
Control Delay		23.5		22.8	8.0	15.8	9.8	9.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		23.5		22.8	8.0	15.8	9.8	9.5
LOS		C		C	A	B	A	A
Approach Delay		23.5		22.8		15.5		9.5
Approach LOS		C		C		B		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 52.7	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 16.6	Intersection LOS: B
Intersection Capacity Utilization 61.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 60: Cedar Avenue S & E 38th Street



Synchro Report for existing conditions (AM Peak) CSAH 152 & E 40th St

The existing and proposed conditions at the CSAH 152 (Cedar Ave) and 40th St intersection were not evaluated as part of the Synchro Analysis as a right-in/right-out condition was introduced circa 2014 that significantly impacted travel patterns.

Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 40th St

County staff is proposing to remove the existing traffic signal at the CSAH 152 and 40th St intersection (pending further evaluation and local approval). Therefore, there are no signal timing plans for the proposed conditions.

CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Synchro Report – Emission Reduction

Existing conditions (AM Peak)

10: Cedar Avenue S & E 31st Street

Direction	All
Future Volume (vph)	1497
Total Delay / Veh (s/v)	13
CO Emissions (kg)	1.46
NOx Emissions (kg)	0.28
VOC Emissions (kg)	0.34

Proposed conditions (AM Peak)

10: Cedar Avenue S & E 31st Street

Direction	All
Future Volume (vph)	1496
Total Delay / Veh (s/v)	12
CO Emissions (kg)	1.42
NOx Emissions (kg)	0.28
VOC Emissions (kg)	0.33

Existing conditions (AM Peak)

20: Cedar Avenue S & E 32nd Street

Direction	All
Future Volume (vph)	1346
Total Delay / Veh (s/v)	8
CO Emissions (kg)	1.20
NOx Emissions (kg)	0.23
VOC Emissions (kg)	0.28

Proposed conditions (AM Peak)

20: Cedar Avenue S & E 32nd Street

Direction	All
Future Volume (vph)	1346
Total Delay / Veh (s/v)	10
CO Emissions (kg)	1.08
NOx Emissions (kg)	0.21
VOC Emissions (kg)	0.25

Existing conditions (AM Peak)

30: Cedar Avenue S & E 34th Street

Direction	All
Future Volume (vph)	1240
Total Delay / Veh (s/v)	4
CO Emissions (kg)	0.84
NOx Emissions (kg)	0.16
VOC Emissions (kg)	0.19

Proposed conditions (AM Peak)

30: Cedar Avenue S & E 34th Street

Direction	All
Future Volume (vph)	1240
Total Delay / Veh (s/v)	2
CO Emissions (kg)	0.71
NOx Emissions (kg)	0.14
VOC Emissions (kg)	0.16

Existing conditions (AM Peak)

40: Cedar Avenue S & E 35th Street

Direction	All
Future Volume (vph)	1596
Total Delay / Veh (s/v)	14
CO Emissions (kg)	1.41
NOx Emissions (kg)	0.27
VOC Emissions (kg)	0.33

Proposed conditions (AM Peak)

40: Cedar Avenue S & E 35th Street

Direction	All
Future Volume (vph)	1596
Total Delay / Veh (s/v)	14
CO Emissions (kg)	1.41
NOx Emissions (kg)	0.27
VOC Emissions (kg)	0.33

Existing conditions (AM Peak)

50: Cedar Avenue S & E 36th Street

Direction	All
Future Volume (vph)	1281
Total Delay / Veh (s/v)	7
CO Emissions (kg)	1.08
NOx Emissions (kg)	0.21
VOC Emissions (kg)	0.25

Proposed conditions (AM Peak)

50: Cedar Avenue S & E 36th Street

Direction	All
Future Volume (vph)	1281
Total Delay / Veh (s/v)	4
CO Emissions (kg)	0.94
NOx Emissions (kg)	0.18
VOC Emissions (kg)	0.22

Existing conditions (AM Peak)

60: Cedar Avenue S & E 38th Street

Direction	All
Future Volume (vph)	1614
Total Delay / Veh (s/v)	17
CO Emissions (kg)	2.41
NOx Emissions (kg)	0.47
VOC Emissions (kg)	0.56

Proposed conditions (AM Peak)

60: Cedar Avenue S & E 38th Street

Direction	All
Future Volume (vph)	1614
Total Delay / Veh (s/v)	17
CO Emissions (kg)	2.41
NOx Emissions (kg)	0.47
VOC Emissions (kg)	0.56

The existing and proposed conditions at the CSAH 152 (Cedar Ave) and 40th St intersection were not evaluated as part of the Synchro Analysis as a right-in/right-out condition was introduced circa 2014 that significantly impacted travel patterns.

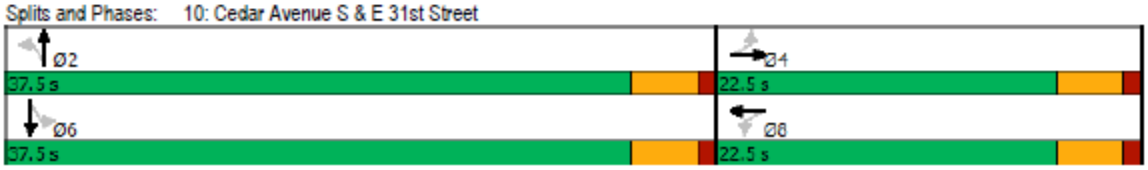
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 31st St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	35	117	29	64	39	725	8	372
Future Volume (vph)	35	117	29	64	39	725	8	372
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0		0.0		0.0
Total Lost Time (s)		4.5		4.5		4.5		4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)		11.2		11.2		35.9		35.9
Actuated g/C Ratio		0.20		0.20		0.64		0.64
v/c Ratio		0.56		0.37		0.74		0.39
Control Delay		23.9		18.2		13.9		6.6
Queue Delay		0.0		0.0		0.0		0.0
Total Delay		23.9		18.2		13.9		6.6
LOS		C		B		B		A
Approach Delay		23.9		18.2		13.9		6.6
Approach LOS		C		B		B		A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56.1	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 13.4	Intersection LOS: B
Intersection Capacity Utilization 79.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 10: Cedar Avenue S & E 31st Street



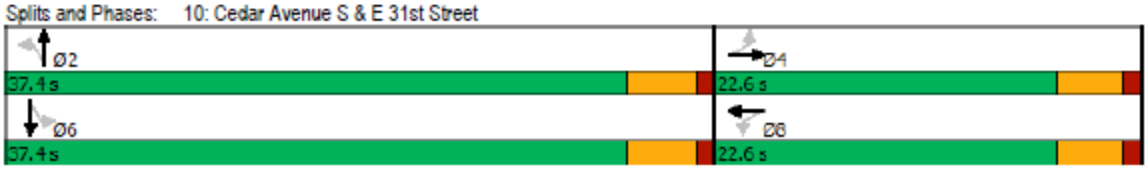
Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 31st St

Timings
Cedar Avenue - Build AM Peak 11/21/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	35	117	29	64	39	725	8	372
Future Volume (vph)	35	117	29	64	39	725	8	372
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.6	22.6	22.6	22.6	37.4	37.4	37.4	37.4
Total Split (%)	37.7%	37.7%	37.7%	37.7%	62.3%	62.3%	62.3%	62.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)		11.2		11.2	35.8	35.8	35.8	35.8
Actuated g/C Ratio		0.20		0.20	0.64	0.64	0.64	0.64
v/c Ratio		0.56		0.37	0.07	0.68	0.03	0.38
Control Delay		23.9		18.1	5.4	11.5	5.4	6.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		23.9		18.1	5.4	11.5	5.4	6.5
LOS		C		B	A	B	A	A
Approach Delay		23.9		18.1		11.2		6.5
Approach LOS		C		B		B		A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 12.0	Intersection LOS: B
Intersection Capacity Utilization 58.9%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 10: Cedar Avenue S & E 31st Street



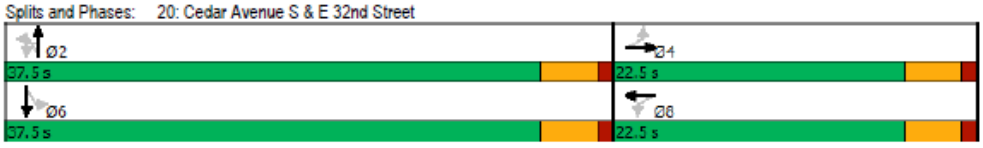
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 32nd St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBU	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	16	33	37	39	1	7	674	27	397
Future Volume (vph)	16	33	37	39	1	7	674	27	397
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA
Protected Phases		4		8			2		6
Permitted Phases	4		8		2	2		6	
Detector Phase	4	4	8	8	2	2	2	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0			0.0		0.0
Total Lost Time (s)		4.5		4.5			4.5		4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		8.3		8.3			38.3		38.3
Actuated g/C Ratio		0.16		0.16			0.73		0.73
v/c Ratio		0.26		0.45			0.60		0.37
Control Delay		17.0		18.9			7.7		5.2
Queue Delay		0.0		0.0			0.0		0.0
Total Delay		17.0		18.9			7.7		5.2
LOS		B		B			A		A
Approach Delay		17.0		18.9			7.7		5.2
Approach LOS		B		B			A		A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 8.3	Intersection LOS: A
Intersection Capacity Utilization 58.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 20: Cedar Avenue S & E 32nd Street



Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 32nd St

County staff is proposing to remove the existing traffic signal at the CSAH 152 and E 32nd St intersection (pending further evaluation and local approval). Therefore, there are no signal timing plans for the proposed conditions.

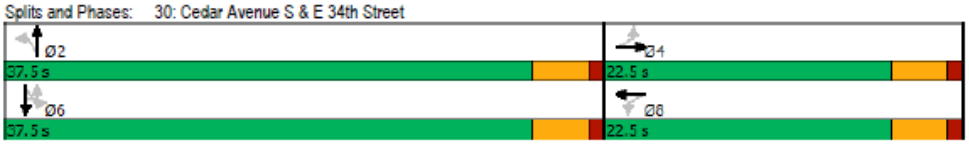
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 34th St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBU	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	7	8	21	6	8	677	4	11	417
Future Volume (vph)	7	8	21	6	8	677	4	11	417
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		2			6
Permitted Phases	4		8		2		6	6	
Detector Phase	4	4	8	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0		0.0			0.0
Total Lost Time (s)		4.5		4.5		4.5			4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		6.6		6.7		45.7			45.7
Actuated g/C Ratio		0.13		0.13		0.87			0.87
v/c Ratio		0.14		0.23		0.48			0.31
Control Delay		16.1		16.4		4.1			2.9
Queue Delay		0.0		0.0		0.0			0.0
Total Delay		16.1		16.4		4.1			2.9
LOS		B		B		A			A
Approach Delay		16.1		16.4		4.1			2.9
Approach LOS		B		B		A			A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.5	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.48	
Intersection Signal Delay: 4.4	Intersection LOS: A
Intersection Capacity Utilization 52.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 30: Cedar Avenue S & E 34th Street



Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 34th St

County staff is proposing to remove the existing traffic signal at the CSAH 152 and E 34th St intersection (pending further evaluation and local approval). Therefore, there are no signal timing plans for the proposed conditions.

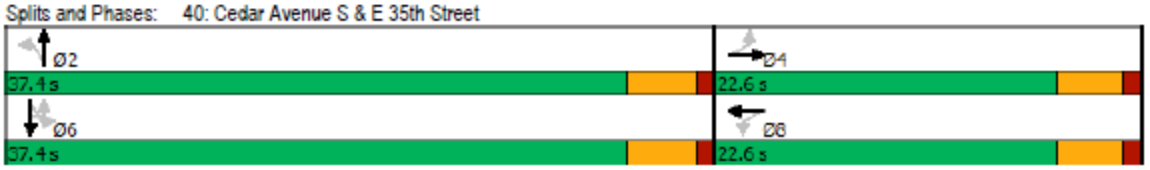
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 35th St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBU	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	26	115	66	141	34	675	1	32	376
Future Volume (vph)	26	115	66	141	34	675	1	32	376
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		2			6
Permitted Phases	4		8		2		6	6	
Detector Phase	4	4	8	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.6	22.6	22.6	22.6	37.4	37.4	37.4	37.4	37.4
Total Split (%)	37.7%	37.7%	37.7%	37.7%	62.3%	62.3%	62.3%	62.3%	62.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5		4.5	4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		13.0		13.0	33.9	33.9		33.9	33.9
Actuated g/C Ratio		0.23		0.23	0.61	0.61		0.61	0.61
v/c Ratio		0.43		0.65	0.07	0.71		0.14	0.40
Control Delay		19.7		27.0	6.2	13.5		7.8	7.7
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0
Total Delay		19.7		27.0	6.2	13.5		7.8	7.7
LOS		B		C	A	B		A	A
Approach Delay		19.7		27.0		13.1			7.7
Approach LOS		B		C		B			A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 67.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 40: Cedar Avenue S & E 35th Street



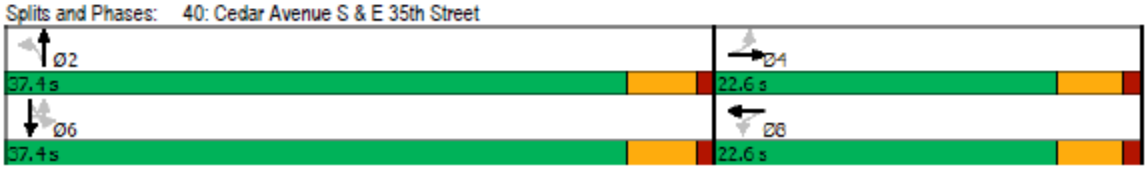
Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 35th St

Timings
Cedar Avenue - Build AM Peak 11/21/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBU	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	26	115	66	141	34	675	1	32	376
Future Volume (vph)	26	115	66	141	34	675	1	32	376
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		2			6
Permitted Phases	4		8		2		6	6	
Detector Phase	4	4	8	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.6	22.6	22.6	22.6	37.4	37.4	37.4	37.4	37.4
Total Split (%)	37.7%	37.7%	37.7%	37.7%	62.3%	62.3%	62.3%	62.3%	62.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5		4.5	4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		13.0		13.0	33.9	33.9		33.9	33.9
Actuated g/C Ratio		0.23		0.23	0.61	0.61		0.61	0.61
v/c Ratio		0.43		0.65	0.07	0.71		0.14	0.40
Control Delay		19.7		27.0	6.2	13.5		7.8	7.7
Queue Delay		0.0		0.0	0.0	0.0		0.0	0.0
Total Delay		19.7		27.0	6.2	13.5		7.8	7.7
LOS		B		C	A	B		A	A
Approach Delay		19.7		27.0		13.1			7.7
Approach LOS		B		C		B			A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 67.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 40: Cedar Avenue S & E 35th Street



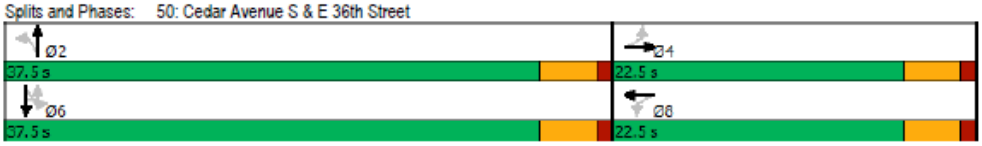
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 36th St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBU	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	24	33	18	20	17	686	3	30	387
Future Volume (vph)	24	33	18	20	17	686	3	30	387
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA
Protected Phases		4		8		2			6
Permitted Phases	4		8		2		6	6	
Detector Phase	4	4	8	8	2	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5	22.5	22.5	37.5	37.5	37.5	37.5	37.5
Total Split (%)	37.5%	37.5%	37.5%	37.5%	62.5%	62.5%	62.5%	62.5%	62.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0		0.0			0.0
Total Lost Time (s)		4.5		4.5		4.5			4.5
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	Max	Max	Max	Max	Max
Act Effct Green (s)		7.5		7.4		41.6			41.6
Actuated g/C Ratio		0.14		0.14		0.80			0.80
v/c Ratio		0.32		0.25		0.53			0.35
Control Delay		20.3		17.3		5.9			4.2
Queue Delay		0.0		0.0		0.0			0.0
Total Delay		20.3		17.3		5.9			4.2
LOS		C		B		A			A
Approach Delay		20.3		17.3		5.9			4.2
Approach LOS		C		B		A			A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.2	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 6.5	Intersection LOS: A
Intersection Capacity Utilization 53.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 50: Cedar Avenue S & E 36th Street



Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 36th St

County staff is proposing to remove the existing traffic signal at the CSAH 152 and E 36th St intersection (pending further evaluation and local approval). Therefore, there are no signal timing plans for the proposed conditions.

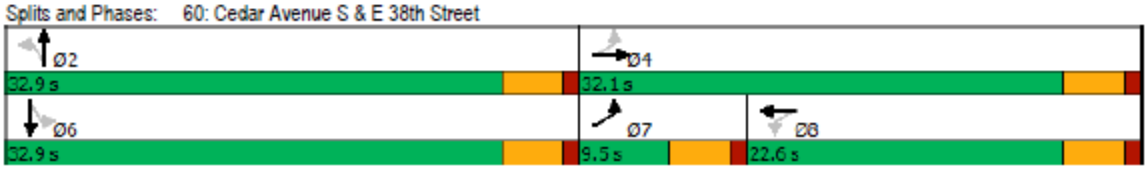
Synchro Report for existing conditions (AM Peak) CSAH 152 & E 38th St

Timings
Cedar Avenue - Existing AM Peak 11/20/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	70	177	67	163	23	594	32	327
Future Volume (vph)	70	177	67	163	23	594	32	327
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	7	4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.5	32.1	22.6	22.6	32.9	32.9	32.9	32.9
Total Split (%)	14.6%	49.4%	34.8%	34.8%	50.6%	50.6%	50.6%	50.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead		Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes				
Recall Mode	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)		15.0		15.0	28.6	28.6	28.6	28.6
Actuated g/C Ratio		0.28		0.28	0.54	0.54	0.54	0.54
v/c Ratio		0.66		0.65	0.05	0.70	0.14	0.40
Control Delay		23.5		22.8	8.0	15.8	9.8	9.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		23.5		22.8	8.0	15.8	9.8	9.5
LOS		C		C	A	B	A	A
Approach Delay		23.5		22.8		15.5		9.5
Approach LOS		C		C		B		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 52.7	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 16.6	Intersection LOS: B
Intersection Capacity Utilization 61.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 60: Cedar Avenue S & E 38th Street



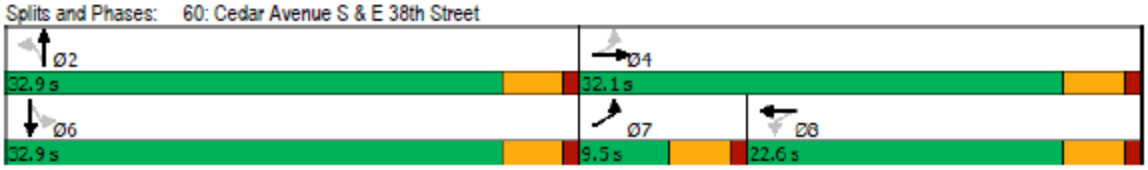
Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 38th St

Timings
Cedar Avenue - Build AM Peak 11/21/2023

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	70	177	67	163	23	594	32	327
Future Volume (vph)	70	177	67	163	23	594	32	327
Turn Type	pm+pt	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	7	4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.5	32.1	22.6	22.6	32.9	32.9	32.9	32.9
Total Split (%)	14.6%	49.4%	34.8%	34.8%	50.6%	50.6%	50.6%	50.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.5		4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead		Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes				
Recall Mode	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)		15.0		15.0	28.6	28.6	28.6	28.6
Actuated g/C Ratio		0.28		0.28	0.54	0.54	0.54	0.54
v/c Ratio		0.66		0.65	0.05	0.70	0.14	0.40
Control Delay		23.5		22.8	8.0	15.8	9.8	9.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		23.5		22.8	8.0	15.8	9.8	9.5
LOS		C		C	A	B	A	A
Approach Delay		23.5		22.8		15.5		9.5
Approach LOS		C		C		B		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 52.7	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 16.6	Intersection LOS: B
Intersection Capacity Utilization 61.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 60: Cedar Avenue S & E 38th Street



Synchro Report for existing conditions (AM Peak) CSAH 152 & E 40th St

The existing and proposed conditions at the CSAH 152 (Cedar Ave) and 40th St intersection were not evaluated as part of the Synchro Analysis as a right-in/right-out condition was introduced circa 2014 that significantly impacted travel patterns.

Synchro Report for proposed conditions (AM Peak) CSAH 152 & E 40th St

County staff is proposing to remove the existing traffic signal at the CSAH 152 and 40th St intersection (pending further evaluation and local approval). Therefore, there are no signal timing plans for the proposed conditions.

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route CSAH 152 **District** Metro **County** Hennepin County

Begin RP 15.61 **End RP** 15.40 **Miles** 0.21

Location From 50' North of CSAH 42 (42nd St) to 40th St

B. Project Description

Proposed Work Resurface pavement and reduce on-street parking availability
Install curb extensions

Project Cost* $15,140,000 **Installation Year** 2028

Project Service Life 20 years **Traffic Growth Factor** 0.5%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

	Fatal (K) Crashes	**Reference**	CMF 09300: Resurface Pavement (14.7% reduction)
	Serious Injury (A) Crashes		No CMF: Reduce on-street parking availability (10% reduction)
	Moderate Injury (B) Crashes	**Crash Type**	CMF 09300: RE, SS, LT, RA, OR, & HO
0.90	**Possible Injury (C) Crashes**		No CMF: Crashes involving parked vehicles
0.87	**Property Damage Only Crashes**		www.CMFclearinghouse.org

D. Crash Modification Factor (optional second CMF)

	Fatal (K) Crashes	**Reference**	CRSP: Introduce curb extensions (40% reduction)
	Serious Injury (A) Crashes		
	Moderate Injury (B) Crashes	**Crash Type**	CRSP: PED
	Possible Injury (C) Crashes		
	Property Damage Only Crashes		www.CMFclearinghouse.org

E. Crash Data

Begin Date 1/1/2020 **End Date** 12/31/2022 3 years

Data Source MnCMAT Version 2.0

Crash Severity	CMF 09300: RE, SS, LT, RA, OR, & HO No CMF: Parked Vehicles	Curb Extensions: PED
K crashes	0	0
A crashes	0	0
B crashes	0	0
C crashes	1	0
PDO crashes	11	0

F. Benefit-Cost Calculation

$219,010	**Benefit (present value)**
$15,140,000	**Cost**

B/C Ratio = 0.02

Proposed project expected to reduce 1 crashes annually, 0 of which involving fatality or serious injury.

F. Analysis Assumptions

Crash Severity	Crash Cost
K crashes	$1,600,000
A crashes	$800,000
B crashes	$250,000
C crashes	$130,000
PDO crashes	$15,000

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

Real Discount Rate: 0.8% Default

Traffic Growth Rate: 0.5% **Revised**

Project Service Life: 20 years **Revised**

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	0.00	0.00	$0
C crashes	0.10	0.03	$4,333
PDO crashes	1.39	0.46	$6,930
			$11,263

H. Amortized Benefit

Year	Crash Benefits	Present Value
2028	$11,263	$11,263
2029	$11,320	$11,230
2030	$11,376	$11,196
2031	$11,433	$11,163
2032	$11,490	$11,130
2033	$11,548	$11,097
2034	$11,605	$11,064
2035	$11,664	$11,031
2036	$11,722	$10,998
2037	$11,780	$10,965
2038	$11,839	$10,933
2039	$11,899	$10,900
2040	$11,958	$10,868
2041	$12,018	$10,835
2042	$12,078	$10,803
2043	$12,138	$10,771
2044	$12,199	$10,739
2045	$12,260	$10,707
2046	$12,321	$10,675
2047	$12,383	$10,643
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 = $219,010

NOTE:
This calculation relies on the real discount rate, which accounts for inflation. No further discounting is necessary.

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route CSAH 152 **District** Metro **County** Hennepin County

Begin RP 15.40 **End RP** 15.34 **Miles** 0.06

Location At 40th St

B. Project Description

Proposed Work Remove unwarranted traffic signal system

Project Cost* $15,140,000 **Installation Year** 2028

Project Service Life 20 years **Traffic Growth Factor** 0.5%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

	Fatal (K) Crashes	**Reference** CMF 00332: Remove unwarranted traffic signal (25% reduction)
	Serious Injury (A) Crashes	
	Moderate Injury (B) Crashes	**Crash Type** CMF 00332: All Crashes
	Possible Injury (C) Crashes	
0.75	**Property Damage Only Crashes**	www.CMFclearinghouse.org

D. Crash Modification Factor (optional second CMF)

	Fatal (K) Crashes	**Reference** Not Applicable
	Serious Injury (A) Crashes	
	Moderate Injury (B) Crashes	**Crash Type** Not Applicable
	Possible Injury (C) Crashes	
	Property Damage Only Crashes	www.CMFclearinghouse.org

E. Crash Data

Begin Date 1/1/2020 **End Date** 12/31/2022 3 years

Data Source MnCMAT Version 2.0

Crash Severity	CMF 00332: All Crashes	None
K crashes	0	0
A crashes	0	0
B crashes	0	0
C crashes	0	0
PDO crashes	3	0

F. Benefit-Cost Calculation

$72,917	**Benefit (present value)**
$15,140,000	**Cost**

B/C Ratio = 0.01

Proposed project expected to reduce 1 crashes annually, 0 of which involving fatality or serious injury.

F. Analysis Assumptions

Crash Severity	Crash Cost
K crashes	$1,600,000
A crashes	$800,000
B crashes	$250,000
C crashes	$130,000
PDO crashes	$15,000

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

Real Discount Rate: 0.8% Default

Traffic Growth Rate: 0.5% **Revised**

Project Service Life: 20 years **Revised**

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	0.00	0.00	$0
C crashes	0.00	0.00	$0
PDO crashes	0.75	0.25	$3,750
			$3,750

H. Amortized Benefit

Year	Crash Benefits	Present Value
2028	$3,750	$3,750
2029	$3,769	$3,739
2030	$3,788	$3,728
2031	$3,807	$3,717
2032	$3,826	$3,706
2033	$3,845	$3,695
2034	$3,864	$3,684
2035	$3,883	$3,673
2036	$3,903	$3,662
2037	$3,922	$3,651
2038	$3,942	$3,640
2039	$3,961	$3,629
2040	$3,981	$3,618
2041	$4,001	$3,607
2042	$4,021	$3,597
2043	$4,041	$3,586
2044	$4,062	$3,575
2045	$4,082	$3,565
2046	$4,102	$3,554
2047	$4,123	$3,544
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 = $72,917

NOTE:
This calculation relies on the real discount rate, which accounts for inflation. No further discounting is necessary.

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route	CSAH 152	**District**	Metro	**County**	Hennepin County
Begin RP	15.34	**End RP**	15.15	**Miles**	0.19
Location	From 40th St to 38th St				

B. Project Description

Proposed Work Resurface pavement and reduce on-street parking availability
Install curb extensions

Project Cost*	$15,140,000	**Installation Year**	2028
Project Service Life	20 years	**Traffic Growth Factor**	0.5%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

	Fatal (K) Crashes	**Reference**	CMF 09300: Resurface Pavement (14.7% reduction)
0.88	**Serious Injury (A) Crashes**		No CMF: Reduce on-street parking availability (10% reduction)
	Moderate Injury (B) Crashes	**Crash Type**	CMF 09300: RE, SS, LT, RA, OR, & HO
0.85	**Possible Injury (C) Crashes**		No CMF: Crashes involving parked vehicles
0.89	**Property Damage Only Crashes**		www.CMFclearinghouse.org

D. Crash Modification Factor (optional second CMF)

	Fatal (K) Crashes	**Reference**	CRSP: Introduce curb extensions (40% reduction)
	Serious Injury (A) Crashes		
	Moderate Injury (B) Crashes	**Crash Type**	CRSP: PED
	Possible Injury (C) Crashes		
	Property Damage Only Crashes		www.CMFclearinghouse.org

E. Crash Data

Begin Date 1/1/2020 **End Date** 12/31/2022 3 years

Data Source MnCMAT Version 2.0

Crash Severity	CMF 09300: RE, SS, LT, RA, OR, & HO No CMF: Parked Vehicles	Curb Extensions: PED
K crashes	0	0
A crashes	2	0
B crashes	0	0
C crashes	1	0
PDO crashes	9	0

F. Benefit-Cost Calculation

$1,506,041	**Benefit (present value)**	**B/C Ratio = 0.10**
$15,140,000	**Cost**	

Proposed project expected to reduce 1 crashes annually, 1 of which involving fatality or serious injury.

F. Analysis Assumptions

Crash Severity	Crash Cost
K crashes	$1,600,000
A crashes	$800,000
B crashes	$250,000
C crashes	$130,000
PDO crashes	$15,000

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

Real Discount Rate: 0.8% Default

Traffic Growth Rate: 0.5% **Revised**

Project Service Life: 20 years **Revised**

G. Annual Benefit

Crash Severity	Crash Reduction	Annual Reduction	Annual Benefit
K crashes	0.00	0.00	$0
A crashes	0.25	0.08	$66,133
B crashes	0.00	0.00	$0
C crashes	0.15	0.05	$6,370
PDO crashes	0.99	0.33	$4,950
			$77,453

H. Amortized Benefit

Year	Crash Benefits	Present Value
2028	$77,453	$77,453
2029	$77,841	$77,223
2030	$78,230	$76,993
2031	$78,621	$76,764
2032	$79,014	$76,535
2033	$79,409	$76,308
2034	$79,806	$76,080
2035	$80,205	$75,854
2036	$80,606	$75,628
2037	$81,009	$75,403
2038	$81,414	$75,179
2039	$81,821	$74,955
2040	$82,230	$74,732
2041	$82,642	$74,510
2042	$83,055	$74,288
2043	$83,470	$74,067
2044	$83,887	$73,846
2045	$84,307	$73,626
2046	$84,728	$73,407
2047	$85,152	$73,189
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 = $1,506,041

NOTE:
This calculation relies on the real discount rate, which accounts for inflation. No further discounting is necessary.

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route CSAH 152 **District** Metro **County** Hennepin County

Begin RP 15.15 **End RP** 15.09 **Miles** 0.06

Location At 38th St

B. Project Description

Proposed Work Install signal mastarms on west approach
Convert LT phasing from permissive only to protected/permitted on north/south approaches

Project Cost* $15,140,000 **Installation Year** 2028

Project Service Life 20 years **Traffic Growth Factor** 0.5%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

	Fatal (K) Crashes	**Reference** CMF 01420: Install signal MA on west app (49% reduction)
	Serious Injury (A) Crashes	CMF 04140: Convert LT phasing from perm to prot/perm (42% reduction)
	Moderate Injury (B) Crashes	**Crash Type** CMF 01420: All crashes involving EB vehicles
	Possible Injury (C) Crashes	CMF 04140: All crashes involving NB/SB vehicles
	Property Damage Only Crashes	www.CMFclearinghouse.org

D. Crash Modification Factor (optional second CMF)

	Fatal (K) Crashes	**Reference** Not Applicable
	Serious Injury (A) Crashes	
	Moderate Injury (B) Crashes	**Crash Type** Not Applicable
	Possible Injury (C) Crashes	
	Property Damage Only Crashes	www.CMFclearinghouse.org

E. Crash Data

Begin Date 1/1/2020 **End Date** 12/31/2022 3 years

Data Source MnCMAT Version 2.0

Crash Severity	CMF 01420: Crashes inv EB Veh CMF 04140: Crashes inv NB/SB Veh	None
K crashes	0	0
A crashes	0	0
B crashes	0	0
C crashes	0	0
PDO crashes	0	0

F. Benefit-Cost Calculation

$0	**Benefit (present value)**	**B/C Ratio = 0.00**
$15,140,000	**Cost**	

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

F. Analysis Assumptions

Crash Severity	Crash Cost
K crashes	$1,600,000
A crashes	$800,000
B crashes	$250,000
C crashes	$130,000
PDO crashes	$15,000

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

Real Discount Rate: 0.8% Default

Traffic Growth Rate: 0.5% **Revised**

Project Service Life: 20 years **Revised**

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	0.00	0.00	$0
C crashes	0.00	0.00	$0
PDO crashes	0.00	0.00	$0
			$0

H. Amortized Benefit

Year	Crash Benefits	Present Value
2028	$0	$0
2029	$0	$0
2030	$0	$0
2031	$0	$0
2032	$0	$0
2033	$0	$0
2034	$0	$0
2035	$0	$0
2036	$0	$0
2037	$0	$0
2038	$0	$0
2039	$0	$0
2040	$0	$0
2041	$0	$0
2042	$0	$0
2043	$0	$0
2044	$0	$0
2045	$0	$0
2046	$0	$0
2047	$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	$0	$0

Total = $0

NOTE:
This calculation relies on the real discount rate, which accounts for inflation. No further discounting is necessary.

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route	CSAH 152	**District**	Metro	**County**	Hennepin County
Begin RP	15.09	**End RP**	14.90	**Miles**	0.19
Location	From 38th St to 36th St				

B. Project Description

Proposed Work Resurface pavement and reduce on-street parking availability
Install curb extensions

Project Cost*	$15,140,000	**Installation Year**	2028
Project Service Life	20 years	**Traffic Growth Factor**	0.5%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

	Fatal (K) Crashes	**Reference**	CMF 09300: Resurface Pavement (14.7% reduction)
0.85	**Serious Injury (A) Crashes**		No CMF: Reduce on-street parking availability (10% reduction)
	Moderate Injury (B) Crashes	**Crash Type**	CMF 09300: RE, SS, LT, RA, OR, & HO
0.87	**Possible Injury (C) Crashes**		No CMF: Crashes involving parked vehicles
0.88	**Property Damage Only Crashes**		www.CMFclearinghouse.org

D. Crash Modification Factor (optional second CMF)

	Fatal (K) Crashes	**Reference**	CRSP: Introduce curb extensions (40% reduction)
	Serious Injury (A) Crashes		
	Moderate Injury (B) Crashes	**Crash Type**	CRSP: PED
	Possible Injury (C) Crashes		
	Property Damage Only Crashes		www.CMFclearinghouse.org

E. Crash Data

Begin Date 1/1/2020 **End Date** 12/31/2022 3 years

Data Source MnCMAT Version 2.0

Crash Severity	CMF 09300: RE, SS, LT, RA, OR, & HO No CMF: Parked Vehicles	Curb Extensions: PED
K crashes	0	0
A crashes	1	0
B crashes	0	0
C crashes	3	0
PDO crashes	9	0

F. Benefit-Cost Calculation

$1,194,865	**Benefit (present value)**	**B/C Ratio = 0.08**
$15,140,000	**Cost**	

Proposed project expected to reduce 1 crashes annually, 1 of which involving fatality or serious injury.

F. Analysis Assumptions

Crash Severity	Crash Cost
K crashes	$1,600,000
A crashes	$800,000
B crashes	$250,000
C crashes	$130,000
PDO crashes	$15,000

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

Real Discount Rate: 0.8% Default

Traffic Growth Rate: 0.5% **Revised**

Project Service Life: 20 years **Revised**

G. Annual Benefit

Crash Severity	Crash Reduction	Annual Reduction	Annual Benefit
K crashes	0.00	0.00	$0
A crashes	0.15	0.05	$39,200
B crashes	0.00	0.00	$0
C crashes	0.39	0.13	$17,030
PDO crashes	1.04	0.35	$5,220
			$61,450

H. Amortized Benefit

Year	Crash Benefits	Present Value
2028	$61,450	$61,450
2029	$61,757	$61,267
2030	$62,066	$61,085
2031	$62,376	$60,903
2032	$62,688	$60,722
2033	$63,002	$60,541
2034	$63,317	$60,361
2035	$63,633	$60,181
2036	$63,951	$60,002
2037	$64,271	$59,823
2038	$64,593	$59,645
2039	$64,916	$59,468
2040	$65,240	$59,291
2041	$65,566	$59,114
2042	$65,894	$58,939
2043	$66,224	$58,763
2044	$66,555	$58,588
2045	$66,887	$58,414
2046	$67,222	$58,240
2047	$67,558	$58,067
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 = $1,194,865

NOTE:
This calculation relies on the real discount rate, which accounts for inflation. No further discounting is necessary.

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route CSAH 152 **District** Metro **County** Hennepin County

Begin RP 14.90 **End RP** 14.84 **Miles** 0.06

Location At 36th St

B. Project Description

Proposed Work Remove unwarranted traffic signal system
Install curb extensions

Project Cost* $15,140,000 **Installation Year** 2028

Project Service Life 20 years **Traffic Growth Factor** 0.5%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

	Fatal (K) Crashes	**Reference**	CMF 00332: Remove unwarranted traffic signal (25% reduction)
	Serious Injury (A) Crashes		
	Moderate Injury (B) Crashes	**Crash Type**	CMF 00332: All Crashes
	Possible Injury (C) Crashes		
0.75	**Property Damage Only Crashes**		www.CMFclearinghouse.org

D. Crash Modification Factor (optional second CMF)

	Fatal (K) Crashes	**Reference**	CRSP: Introduce curb extensions (40% reduction)
	Serious Injury (A) Crashes		
	Moderate Injury (B) Crashes	**Crash Type**	CRSP: PED
	Possible Injury (C) Crashes		
	Property Damage Only Crashes		www.CMFclearinghouse.org

E. Crash Data

Begin Date 1/1/2020 **End Date** 12/31/2022 3 years

Data Source MnCMAT Version 2.0

Crash Severity	CMF 00332: All Crashes	Curb Extensions: PED
K crashes	0	0
A crashes	0	0
B crashes	0	0
C crashes	0	0
PDO crashes	2	0

F. Benefit-Cost Calculation

$48,612	**Benefit (present value)**	**B/C Ratio = 0.01**
$15,140,000	**Cost**	

Proposed project expected to reduce 1 crashes annually, 0 of which involving fatality or serious injury.

F. Analysis Assumptions

Crash Severity	Crash Cost
K crashes	$1,600,000
A crashes	$800,000
B crashes	$250,000
C crashes	$130,000
PDO crashes	$15,000

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

Real Discount Rate: 0.8% Default

Traffic Growth Rate: 0.5% **Revised**

Project Service Life: 20 years **Revised**

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	0.00	0.00	$0
C crashes	0.00	0.00	$0
PDO crashes	0.50	0.17	$2,500
			$2,500

H. Amortized Benefit

Year	Crash Benefits	Present Value
2028	$2,500	$2,500
2029	$2,513	$2,493
2030	$2,525	$2,485
2031	$2,538	$2,478
2032	$2,550	$2,470
2033	$2,563	$2,463
2034	$2,576	$2,456
2035	$2,589	$2,448
2036	$2,602	$2,441
2037	$2,615	$2,434
2038	$2,628	$2,427
2039	$2,641	$2,419
2040	$2,654	$2,412
2041	$2,667	$2,405
2042	$2,681	$2,398
2043	$2,694	$2,391
2044	$2,708	$2,384
2045	$2,721	$2,376
2046	$2,735	$2,369
2047	$2,748	$2,362
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 = $48,612

NOTE:
This calculation relies on the real discount rate, which accounts for inflation. No further discounting is necessary.

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route	CSAH 152	**District**	Metro	**County**	Hennepin County
Begin RP	14.84	**End RP**	14.78	**Miles**	0.06
Location	From 36th St to 35th St				

B. Project Description

Proposed Work	Resurface pavement and reduce on-street parking availability Install curb extensions		
Project Cost*	$15,140,000	**Installation Year**	2028
Project Service Life	20 years	**Traffic Growth Factor**	0.5%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

	Fatal (K) Crashes	**Reference**	CMF 09300: Resurface Pavement (14.7% reduction)
	Serious Injury (A) Crashes		No CMF: Reduce on-street parking availability (10% reduction)
	Moderate Injury (B) Crashes	**Crash Type**	CMF 09300: RE, SS, LT, RA, OR, & HO
	Possible Injury (C) Crashes		No CMF: Crashes involving parked vehicles
0.87	**Property Damage Only Crashes**		www.CMFclearinghouse.org

D. Crash Modification Factor (optional second CMF)

	Fatal (K) Crashes	**Reference**	CRSP: Introduce curb extensions (40% reduction)
	Serious Injury (A) Crashes		
	Moderate Injury (B) Crashes	**Crash Type**	CRSP: PED
	Possible Injury (C) Crashes		
	Property Damage Only Crashes		www.CMFclearinghouse.org

E. Crash Data

Begin Date 1/1/2020 **End Date** 12/31/2022 3 years

Data Source MnCMAT Version 2.0

Crash Severity	CMF 09300: RE, SS, LT, RA, OR, & HO No CMF: Parked Vehicles	Curb Extensions: PED
K crashes	0	0
A crashes	0	0
B crashes	0	0
C crashes	0	0
PDO crashes	7	0

F. Benefit-Cost Calculation

$86,431	**Benefit (present value)**	**B/C Ratio = 0.01**
$15,140,000	**Cost**	

Proposed project expected to reduce 1 crashes annually, 0 of which involving fatality or serious injury.

F. Analysis Assumptions

Crash Severity	Crash Cost
K crashes	$1,600,000
A crashes	$800,000
B crashes	$250,000
C crashes	$130,000
PDO crashes	$15,000

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

Real Discount Rate: 0.8% Default

Traffic Growth Rate: 0.5% **Revised**

Project Service Life: 20 years **Revised**

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	0.00	0.00	$0
C crashes	0.00	0.00	$0
PDO crashes	0.89	0.30	$4,445
			$4,445

H. Amortized Benefit

Year	Crash Benefits	Present Value
2028	$4,445	$4,445
2029	$4,467	$4,432
2030	$4,490	$4,419
2031	$4,512	$4,405
2032	$4,535	$4,392
2033	$4,557	$4,379
2034	$4,580	$4,366
2035	$4,603	$4,353
2036	$4,626	$4,340
2037	$4,649	$4,327
2038	$4,672	$4,314
2039	$4,696	$4,302
2040	$4,719	$4,289
2041	$4,743	$4,276
2042	$4,766	$4,263
2043	$4,790	$4,251
2044	$4,814	$4,238
2045	$4,838	$4,225
2046	$4,863	$4,213
2047	$4,887	$4,200
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 = $86,431

NOTE:
This calculation relies on the real discount rate, which accounts for inflation. No further discounting is necessary.

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route	CSAH 152	**District**	Metro	**County**	Hennepin County
Begin RP	14.78	**End RP**	14.72	**Miles**	0.06
Location	At 35th St				

B. Project Description

Proposed Work Install signal mastarms on east/west approaches
Convert LT phasing from permissive only to protected/permitted on north/south approaches

Project Cost*	$15,140,000	**Installation Year**	2028
Project Service Life	20 years	**Traffic Growth Factor**	0.5%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

	Fatal (K) Crashes	**Reference**	CMF 01420: Install signal MA on east/west app (49% reduction)
	Serious Injury (A) Crashes		CMF 04140: Convert LT phasing from perm to prot/perm (42% reduction)
0.51	**Moderate Injury (B) Crashes**	**Crash Type**	CMF 01420: All crashes involving EB/WB vehicles
0.51	**Possible Injury (C) Crashes**		CMF 04140: All crashes involving NB/SB vehicles
0.54	**Property Damage Only Crashes**		www.CMFclearinghouse.org

D. Crash Modification Factor (optional second CMF)

	Fatal (K) Crashes	**Reference**	CRSP: Introduce curb extensions (40% reduction)
	Serious Injury (A) Crashes		
	Moderate Injury (B) Crashes	**Crash Type**	CRSP: PED
	Possible Injury (C) Crashes		
	Property Damage Only Crashes		www.CMFclearinghouse.org

E. Crash Data

Begin Date 1/1/2020 **End Date** 12/31/2022 3 years

Data Source MnCMAT Version 2.0

Crash Severity	CMF 01420: Crashes inv EB/WB Veh CMF 04140: Crashes inv NB/SB Veh	Curb Extensions: PED
K crashes	0	0
A crashes	0	0
B crashes	1	0
C crashes	2	0
PDO crashes	5	0

F. Benefit-Cost Calculation

$1,844,311	**Benefit (present value)**	**B/C Ratio = 0.13**
$15,140,000	**Cost**	

Proposed project expected to reduce 2 crashes annually, 0 of which involving fatality or serious injury.

F. Analysis Assumptions

Crash Severity	Crash Cost
K crashes	$1,600,000
A crashes	$800,000
B crashes	$250,000
C crashes	$130,000
PDO crashes	$15,000

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

Real Discount Rate: 0.8% Default

Traffic Growth Rate: 0.5% **Revised**

Project Service Life: 20 years **Revised**

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	$40,833
C crashes	0.98	0.33	$42,467
PDO crashes	2.31	0.77	$11,550
			$94,850

H. Amortized Benefit

Year	Crash Benefits	Present Value
2028	$94,850	$94,850
2029	$95,324	$94,568
2030	$95,801	$94,286
2031	$96,280	$94,006
2032	$96,761	$93,726
2033	$97,245	$93,447
2034	$97,731	$93,169
2035	$98,220	$92,892
2036	$98,711	$92,615
2037	$99,205	$92,339
2038	$99,701	$92,065
2039	$100,199	$91,791
2040	$100,700	$91,517
2041	$101,204	$91,245
2042	$101,710	$90,973
2043	$102,218	$90,703
2044	$102,729	$90,433
2045	$103,243	$90,164
2046	$103,759	$89,895
2047	$104,278	$89,628
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 = $1,844,311

NOTE:
This calculation relies on the real discount rate, which accounts for inflation. No further discounting is necessary.

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route	CSAH 152	**District**	Metro	**County**	Hennepin County
Begin RP	14.72	**End RP**	14.65	**Miles**	0.07
Location	From 35th St to 34th St				

B. Project Description

Proposed Work	Resurface pavement and reduce on-street parking availability Install curb extensions		
Project Cost*	$15,140,000	**Installation Year**	2028
Project Service Life	20 years	**Traffic Growth Factor**	0.5%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

	Fatal (K) Crashes	**Reference**	CMF 09300: Resurface Pavement (14.7% reduction)
	Serious Injury (A) Crashes		No CMF: Reduce on-street parking availability (10% reduction)
	Moderate Injury (B) Crashes	**Crash Type**	CMF 09300: RE, SS, LT, RA, OR, & HO
0.88	**Possible Injury (C) Crashes**		No CMF: Crashes involving parked vehicles
0.89	**Property Damage Only Crashes**		www.CMFclearinghouse.org

D. Crash Modification Factor (optional second CMF)

	Fatal (K) Crashes	**Reference**	CRSP: Introduce curb extensions (40% reduction)
	Serious Injury (A) Crashes		
	Moderate Injury (B) Crashes	**Crash Type**	CRSP: PED
	Possible Injury (C) Crashes		
	Property Damage Only Crashes		www.CMFclearinghouse.org

E. Crash Data

Begin Date 1/1/2020 **End Date** 12/31/2022 3 years

Data Source MnCMAT Version 2.0

Crash Severity	CMF 09300: RE, SS, LT, RA, OR, & HO No CMF: Parked Vehicles	Curb Extensions: PED
K crashes	0	0
A crashes	0	0
B crashes	0	0
C crashes	2	0
PDO crashes	8	0

F. Benefit-Cost Calculation

$291,409	**Benefit (present value)**	**B/C Ratio = 0.02**
$15,140,000	**Cost**	

Proposed project expected to reduce 1 crashes annually, 0 of which involving fatality or serious injury.

F. Analysis Assumptions

Crash Severity	Crash Cost
K crashes	$1,600,000
A crashes	$800,000
B crashes	$250,000
C crashes	$130,000
PDO crashes	$15,000

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

Real Discount Rate: 0.8% Default

Traffic Growth Rate: 0.5% **Revised**

Project Service Life: 20 years **Revised**

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	0.00	0.00	$0
C crashes	0.25	0.08	$10,747
PDO crashes	0.85	0.28	$4,240
			$14,987

H. Amortized Benefit

Year	Crash Benefits	Present Value
2028	$14,987	$14,987
2029	$15,062	$14,942
2030	$15,137	$14,898
2031	$15,213	$14,853
2032	$15,289	$14,809
2033	$15,365	$14,765
2034	$15,442	$14,721
2035	$15,519	$14,677
2036	$15,597	$14,634
2037	$15,675	$14,590
2038	$15,753	$14,547
2039	$15,832	$14,503
2040	$15,911	$14,460
2041	$15,991	$14,417
2042	$16,071	$14,374
2043	$16,151	$14,331
2044	$16,232	$14,289
2045	$16,313	$14,246
2046	$16,394	$14,204
2047	$16,476	$14,162
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 = $291,409

NOTE:
This calculation relies on the real discount rate, which accounts for inflation. No further discounting is necessary.

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route	CSAH 152	**District**	Metro	**County**	Hennepin County
Begin RP	14.65	**End RP**	14.59	**Miles**	0.06
Location	At 34th St				

B. Project Description

Proposed Work Remove unwarranted traffic signal system
Install curb extensions

Project Cost*	$15,140,000	**Installation Year**	2028
Project Service Life	20 years	**Traffic Growth Factor**	0.5%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

	Fatal (K) Crashes	**Reference**	CMF 00332: Remove unwarranted traffic signal (25% reduction)
	Serious Injury (A) Crashes		
0.75	**Moderate Injury (B) Crashes**	**Crash Type**	CMF 00332: All Crashes
	Possible Injury (C) Crashes		
0.75	**Property Damage Only Crashes**		www.CMFclearinghouse.org

D. Crash Modification Factor (optional second CMF)

	Fatal (K) Crashes	**Reference**	CRSP: Introduce curb extensions (40% reduction)
	Serious Injury (A) Crashes		
	Moderate Injury (B) Crashes	**Crash Type**	CRSP: PED
	Possible Injury (C) Crashes		
	Property Damage Only Crashes		www.CMFclearinghouse.org

E. Crash Data

Begin Date 1/1/2020 **End Date** 12/31/2022 3 years

Data Source MnCMAT Version 2.0

Crash Severity	CMF 00332: All Crashes	Curb Extensions: PED
K crashes	0	0
A crashes	0	0
B crashes	3	0
C crashes	0	0
PDO crashes	1	0

F. Benefit-Cost Calculation

$1,239,587	**Benefit (present value)**
$15,140,000	**Cost**

B/C Ratio = 0.09

Proposed project expected to reduce 1 crashes annually, 0 of which involving fatality or serious injury.

F. Analysis Assumptions

Crash Severity	Crash Cost
K crashes	$1,600,000
A crashes	$800,000
B crashes	$250,000
C crashes	$130,000
PDO crashes	$15,000

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

Real Discount Rate: 0.8% Default

Traffic Growth Rate: 0.5% **Revised**

Project Service Life: 20 years **Revised**

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	0.75	0.25	$62,500
C crashes	0.00	0.00	$0
PDO crashes	0.25	0.08	$1,250
			$63,750

H. Amortized Benefit

Year	Crash Benefits	Present Value
2028	$63,750	$63,750
2029	$64,069	$63,560
2030	$64,389	$63,371
2031	$64,711	$63,182
2032	$65,035	$62,994
2033	$65,360	$62,807
2034	$65,687	$62,620
2035	$66,015	$62,434
2036	$66,345	$62,248
2037	$66,677	$62,063
2038	$67,010	$61,878
2039	$67,345	$61,694
2040	$67,682	$61,510
2041	$68,020	$61,327
2042	$68,360	$61,145
2043	$68,702	$60,963
2044	$69,046	$60,781
2045	$69,391	$60,600
2046	$69,738	$60,420
2047	$70,087	$60,240
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 = $1,239,587

NOTE:
This calculation relies on the real discount rate, which accounts for inflation. No further discounting is necessary.

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route	CSAH 152	**District**	Metro	**County**	Hennepin County
Begin RP	14.59	**End RP**	14.42	**Miles**	0.17
Location	From 34th St to 32nd St				

B. Project Description

Proposed Work Resurface pavement and reduce on-street parking availability
Install curb extensions

Project Cost*	$15,140,000	**Installation Year**	2028
Project Service Life	20 years	**Traffic Growth Factor**	0.5%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

	Fatal (K) Crashes	**Reference**	CMF 09300: Resurface Pavement (14.7% reduction)
0.85	**Serious Injury (A) Crashes**		No CMF: Reduce on-street parking availability (10% reduction)
	Moderate Injury (B) Crashes	**Crash Type**	CMF 09300: RE, SS, LT, RA, OR, & HO
0.85	**Possible Injury (C) Crashes**		No CMF: Crashes involving parked vehicles
0.86	**Property Damage Only Crashes**		www.CMFclearinghouse.org

D. Crash Modification Factor (optional second CMF)

	Fatal (K) Crashes	**Reference**	CRSP: Introduce curb extensions (40% reduction)
	Serious Injury (A) Crashes		
	Moderate Injury (B) Crashes	**Crash Type**	CRSP: PED
	Possible Injury (C) Crashes		
	Property Damage Only Crashes		www.CMFclearinghouse.org

E. Crash Data

Begin Date 1/1/2020 **End Date** 12/31/2022 3 years

Data Source MnCMAT Version 2.0

Crash Severity	CMF 09300: RE, SS, LT, RA, OR, & HO No CMF: Parked Vehicles	Curb Extensions: PED
K crashes	0	0
A crashes	1	0
B crashes	0	0
C crashes	3	0
PDO crashes	9	0

F. Benefit-Cost Calculation

$1,253,684	**Benefit (present value)**	**B/C Ratio = 0.09**
$15,140,000	**Cost**	

Proposed project expected to reduce 1 crashes annually, 1 of which involving fatality or serious injury.

F. Analysis Assumptions

Crash Severity	Crash Cost
K crashes	$1,600,000
A crashes	$800,000
B crashes	$250,000
C crashes	$130,000
PDO crashes	$15,000

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

Real Discount Rate: 0.8% Default

Traffic Growth Rate: 0.5% **Revised**

Project Service Life: 20 years **Revised**

G. Annual Benefit

Crash Severity	Crash Reduction	Annual Reduction	Annual Benefit
K crashes	0.00	0.00	$0
A crashes	0.15	0.05	$39,200
B crashes	0.00	0.00	$0
C crashes	0.44	0.15	$19,110
PDO crashes	1.23	0.41	$6,165
			$64,475

H. Amortized Benefit

Year	Crash Benefits	Present Value
2028	$64,475	$64,475
2029	$64,797	$64,283
2030	$65,121	$64,092
2031	$65,447	$63,901
2032	$65,774	$63,711
2033	$66,103	$63,521
2034	$66,434	$63,332
2035	$66,766	$63,144
2036	$67,100	$62,956
2037	$67,435	$62,768
2038	$67,772	$62,582
2039	$68,111	$62,395
2040	$68,452	$62,210
2041	$68,794	$62,024
2042	$69,138	$61,840
2043	$69,484	$61,656
2044	$69,831	$61,472
2045	$70,180	$61,289
2046	$70,531	$61,107
2047	$70,884	$60,925
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 = $1,253,684

NOTE:
This calculation relies on the real discount rate, which accounts for inflation. No further discounting is necessary.

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route	CSAH 152	**District**	Metro	**County**	Hennepin County
Begin RP	14.42	**End RP**	14.36	**Miles**	0.06
Location	At 32nd St				

B. Project Description

Proposed Work Remove unwarranted traffic signal system
Install curb extensions

Project Cost*	$15,140,000	**Installation Year**	2028
Project Service Life	20 years	**Traffic Growth Factor**	0.5%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

	Fatal (K) Crashes	**Reference**	CMF 00332: Remove unwarranted traffic signal (25% reduction)
	Serious Injury (A) Crashes		
0.75	**Moderate Injury (B) Crashes**	**Crash Type**	CMF 00332: All Crashes
	Possible Injury (C) Crashes		
	Property Damage Only Crashes		www.CMFclearinghouse.org

D. Crash Modification Factor (optional second CMF)

	Fatal (K) Crashes	**Reference**	CRSP: Introduce curb extensions (40% reduction)
	Serious Injury (A) Crashes		
	Moderate Injury (B) Crashes	**Crash Type**	CRSP: PED
0.60	**Possible Injury (C) Crashes**		
	Property Damage Only Crashes		www.CMFclearinghouse.org

E. Crash Data

Begin Date 1/1/2020 **End Date** 12/31/2022 3 years

Data Source MnCMAT Version 2.0

Crash Severity	CMF 00332: All Crashes	Curb Extensions: PED
K crashes	0	0
A crashes	0	0
B crashes	1	0
C crashes	0	1
PDO crashes	0	0

F. Benefit-Cost Calculation

$742,132	**Benefit (present value)**	**B/C Ratio = 0.05**
$15,140,000	**Cost**	

Proposed project expected to reduce 1 crashes annually, 0 of which involving fatality or serious injury.

F. Analysis Assumptions

Crash Severity	Crash Cost
K crashes	$1,600,000
A crashes	$800,000
B crashes	$250,000
C crashes	$130,000
PDO crashes	$15,000

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

Real Discount Rate: 0.8% Default

Traffic Growth Rate: 0.5% **Revised**

Project Service Life: 20 years **Revised**

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	0.25	0.08	$20,833
C crashes	0.40	0.13	$17,333
PDO crashes	0.00	0.00	$0
			$38,167

H. Amortized Benefit

Year	Crash Benefits	Present Value
2028	$38,167	$38,167
2029	$38,358	$38,053
2030	$38,549	$37,940
2031	$38,742	$37,827
2032	$38,936	$37,714
2033	$39,130	$37,602
2034	$39,326	$37,490
2035	$39,523	$37,379
2036	$39,720	$37,267
2037	$39,919	$37,156
2038	$40,119	$37,046
2039	$40,319	$36,936
2040	$40,521	$36,826
2041	$40,723	$36,716
2042	$40,927	$36,607
2043	$41,132	$36,498
2044	$41,337	$36,389
2045	$41,544	$36,281
2046	$41,752	$36,173
2047	$41,960	$36,065
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 = $742,132

NOTE:
This calculation relies on the real discount rate, which accounts for inflation. No further discounting is necessary.

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route	CSAH 152	**District**	Metro	**County**	Hennepin County
Begin RP	14.36	**End RP**	14.29	**Miles**	0.07
Location	From 32nd St to 31st St				

B. Project Description

Proposed Work Resurface pavement and reduce on-street parking availability
Install curb extensions

Project Cost*	$15,140,000	**Installation Year**	2028
Project Service Life	20 years	**Traffic Growth Factor**	0.5%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

	Fatal (K) Crashes	**Reference**	CMF 09300: Resurface Pavement (14.7% reduction)
	Serious Injury (A) Crashes		No CMF: Reduce on-street parking availability (10% reduction)
0.85	**Moderate Injury (B) Crashes**	**Crash Type**	CMF 09300: RE, SS, LT, RA, OR, & HO
0.90	**Possible Injury (C) Crashes**		No CMF: Crashes involving parked vehicles
0.88	**Property Damage Only Crashes**		www.CMFclearinghouse.org

D. Crash Modification Factor (optional second CMF)

	Fatal (K) Crashes	**Reference**	CRSP: Introduce curb extensions (40% reduction)
	Serious Injury (A) Crashes		
	Moderate Injury (B) Crashes	**Crash Type**	CRSP: PED
	Possible Injury (C) Crashes		
	Property Damage Only Crashes		www.CMFclearinghouse.org

E. Crash Data

Begin Date 1/1/2020 **End Date** 12/31/2022 3 years

Data Source MnCMAT Version 2.0

Crash Severity	CMF 09300: RE, SS, LT, RA, OR, & HO No CMF: Parked Vehicles	Curb Extensions: PED
K crashes	0	0
A crashes	0	0
B crashes	1	0
C crashes	1	0
PDO crashes	12	0

F. Benefit-Cost Calculation

$457,789	**Benefit (present value)**
$15,140,000	**Cost**

B/C Ratio = 0.04

Proposed project expected to reduce 1 crashes annually, 0 of which involving fatality or serious injury.

F. Analysis Assumptions

Crash Severity	Crash Cost
K crashes	$1,600,000
A crashes	$800,000
B crashes	$250,000
C crashes	$130,000
PDO crashes	$15,000

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

Real Discount Rate: 0.8% Default

Traffic Growth Rate: 0.5% **Revised**

Project Service Life: 20 years **Revised**

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	0.15	0.05	$12,250
C crashes	0.10	0.03	$4,333
PDO crashes	1.39	0.46	$6,960
			$23,543

H. Amortized Benefit

Year	Crash Benefits	Present Value
2028	$23,543	$23,543
2029	$23,661	$23,473
2030	$23,779	$23,403
2031	$23,898	$23,334
2032	$24,018	$23,264
2033	$24,138	$23,195
2034	$24,259	$23,126
2035	$24,380	$23,057
2036	$24,502	$22,989
2037	$24,624	$22,920
2038	$24,747	$22,852
2039	$24,871	$22,784
2040	$24,995	$22,716
2041	$25,120	$22,649
2042	$25,246	$22,581
2043	$25,372	$22,514
2044	$25,499	$22,447
2045	$25,627	$22,380
2046	$25,755	$22,313
2047	$25,884	$22,247
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 = $457,789

NOTE:
This calculation relies on the real discount rate, which accounts for inflation. No further discounting is necessary.

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route	CSAH 152	**District**	Metro	**County**	Hennepin County
Begin RP	14.29	**End RP**	14.23	**Miles**	0.06
Location	At 31st St				

B. Project Description

Proposed Work Convert LT phasing from permissive only to protected/permitted on north/south approaches
Introduce dedicated LT lanes along north/south approaches

Project Cost*	$15,140,000	**Installation Year**	2028
Project Service Life	20 years	**Traffic Growth Factor**	0.5%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

	Fatal (K) Crashes	**Reference**	CMF 04140: Convert LT phasing from perm to prot/perm (42% reduction)
	Serious Injury (A) Crashes		CMF 07998: Introduce LT lanes on N/S app (12.4% reduction)
0.51	**Moderate Injury (B) Crashes**	**Crash Type**	CMF 04140: All crashes involving NB/SB vehicles
0.60	**Possible Injury (C) Crashes**		CMF 07998: All crashes involving NB/SB vehicles
0.51	**Property Damage Only Crashes**		www.CMFclearinghouse.org

D. Crash Modification Factor (optional second CMF)

	Fatal (K) Crashes	**Reference**	Not Applicable
	Serious Injury (A) Crashes		
	Moderate Injury (B) Crashes	**Crash Type**	Not Applicable
	Possible Injury (C) Crashes		
	Property Damage Only Crashes		www.CMFclearinghouse.org

E. Crash Data

Begin Date 1/1/2020 **End Date** 12/31/2022 3 years

Data Source MnCMAT Version 2.0

Crash Severity	CMF 04140: Crashes inv NB/SB Veh CMF 07998: Crashes inv NB/SB Veh	None
K crashes	0	0
A crashes	0	0
B crashes	1	0
C crashes	3	0
PDO crashes	4	0

F. Benefit-Cost Calculation

$1,994,617	**Benefit (present value)**	**B/C Ratio = 0.14**
$15,140,000	**Cost**	

Proposed project expected to reduce 2 crashes annually, 0 of which involving fatality or serious injury.

F. Analysis Assumptions

Crash Severity	Crash Cost
K crashes	$1,600,000
A crashes	$800,000
B crashes	$250,000
C crashes	$130,000
PDO crashes	$15,000

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

Real Discount Rate: 0.8% Default

Traffic Growth Rate: 0.5% **Revised**

Project Service Life: 20 years **Revised**

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	$41,000
C crashes	1.19	0.40	$51,740
PDO crashes	1.97	0.66	$9,840
			$102,580

H. Amortized Benefit

Year	Crash Benefits	Present Value
2028	$102,580	$102,580
2029	$103,093	$102,275
2030	$103,608	$101,970
2031	$104,126	$101,667
2032	$104,647	$101,364
2033	$105,170	$101,063
2034	$105,696	$100,762
2035	$106,225	$100,462
2036	$106,756	$100,163
2037	$107,290	$99,865
2038	$107,826	$99,568
2039	$108,365	$99,271
2040	$108,907	$98,976
2041	$109,451	$98,681
2042	$109,999	$98,388
2043	$110,549	$98,095
2044	$111,101	$97,803
2045	$111,657	$97,512
2046	$112,215	$97,221
2047	$112,776	$96,932
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 = $1,994,617

NOTE:
This calculation relies on the real discount rate, which accounts for inflation. No further discounting is necessary.

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route CSAH 152 **District** Metro **County** Hennepin County

Begin RP 14.23 **End RP** 14.14 **Miles** 0.09

Location From 31st St to 50' South of CSAH 3 (Lake St)

B. Project Description

Proposed Work Resurface pavement and reduce on-street parking availability
Install curb extensions

Project Cost* $15,140,000 **Installation Year** 2028

Project Service Life 20 years **Traffic Growth Factor** 0.5%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

	Fatal (K) Crashes	**Reference**	CMF 09300: Resurface Pavement (14.7% reduction)
	Serious Injury (A) Crashes		No CMF: Reduce on-street parking availability (10% reduction)
	Moderate Injury (B) Crashes	**Crash Type**	CMF 09300: RE, SS, LT, RA, OR, & HO
	Possible Injury (C) Crashes		No CMF: Crashes involving parked vehicles
0.90	**Property Damage Only Crashes**		www.CMFclearinghouse.org

D. Crash Modification Factor (optional second CMF)

	Fatal (K) Crashes	**Reference**	CRSP: Introduce curb extensions (40% reduction)
	Serious Injury (A) Crashes		
	Moderate Injury (B) Crashes	**Crash Type**	CRSP: PED
	Possible Injury (C) Crashes		
	Property Damage Only Crashes		www.CMFclearinghouse.org

E. Crash Data

Begin Date 1/1/2020 **End Date** 12/31/2022 3 years

Data Source MnCMAT Version 2.0

Crash Severity	CMF 09300: RE, SS, LT, RA, OR, & HO No CMF: Parked Vehicles	Curb Extensions: PED
K crashes	0	0
A crashes	0	0
B crashes	0	0
C crashes	0	0
PDO crashes	1	0

F. Benefit-Cost Calculation

$9,723	**Benefit (present value)**	**B/C Ratio = 0.01**
$15,140,000	**Cost**	

Proposed project expected to reduce 1 crashes annually, 0 of which involving fatality or serious injury.

F. Analysis Assumptions

Crash Severity	Crash Cost
K crashes	$1,600,000
A crashes	$800,000
B crashes	$250,000
C crashes	$130,000
PDO crashes	$15,000

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

Real Discount Rate: 0.8% Default

Traffic Growth Rate: 0.5% **Revised**

Project Service Life: 20 years **Revised**

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	0.00	0.00	$0
C crashes	0.00	0.00	$0
PDO crashes	0.10	0.03	$500
			$500

H. Amortized Benefit

Year	Crash Benefits	Present Value
2028	$500	$500
2029	$503	$499
2030	$505	$497
2031	$508	$496
2032	$510	$494
2033	$513	$493
2034	$515	$491
2035	$518	$490
2036	$520	$488
2037	$523	$487
2038	$526	$485
2039	$528	$484
2040	$531	$482
2041	$533	$481
2042	$536	$480
2043	$539	$478
2044	$542	$477
2045	$544	$475
2046	$547	$474
2047	$550	$472
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 = $9,723

NOTE:
This calculation relies on the real discount rate, which accounts for inflation. No further discounting is necessary.

CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 05 | Potential Concept

HENNEPIN COUNTY
MINNESOTA

0 50 100
SCALE IN FEET

Figure 1

Job #16612
11/3/2023
H:\Projects\16000\16612\TechData\CADDesign\Graphics\CSAH 152 - Cedar Ave\16612_gr01_CSAH 152.dgn

CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 05 | Potential Concept

HENNEPIN COUNTY
MINNESOTA

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SCALE IN FEET

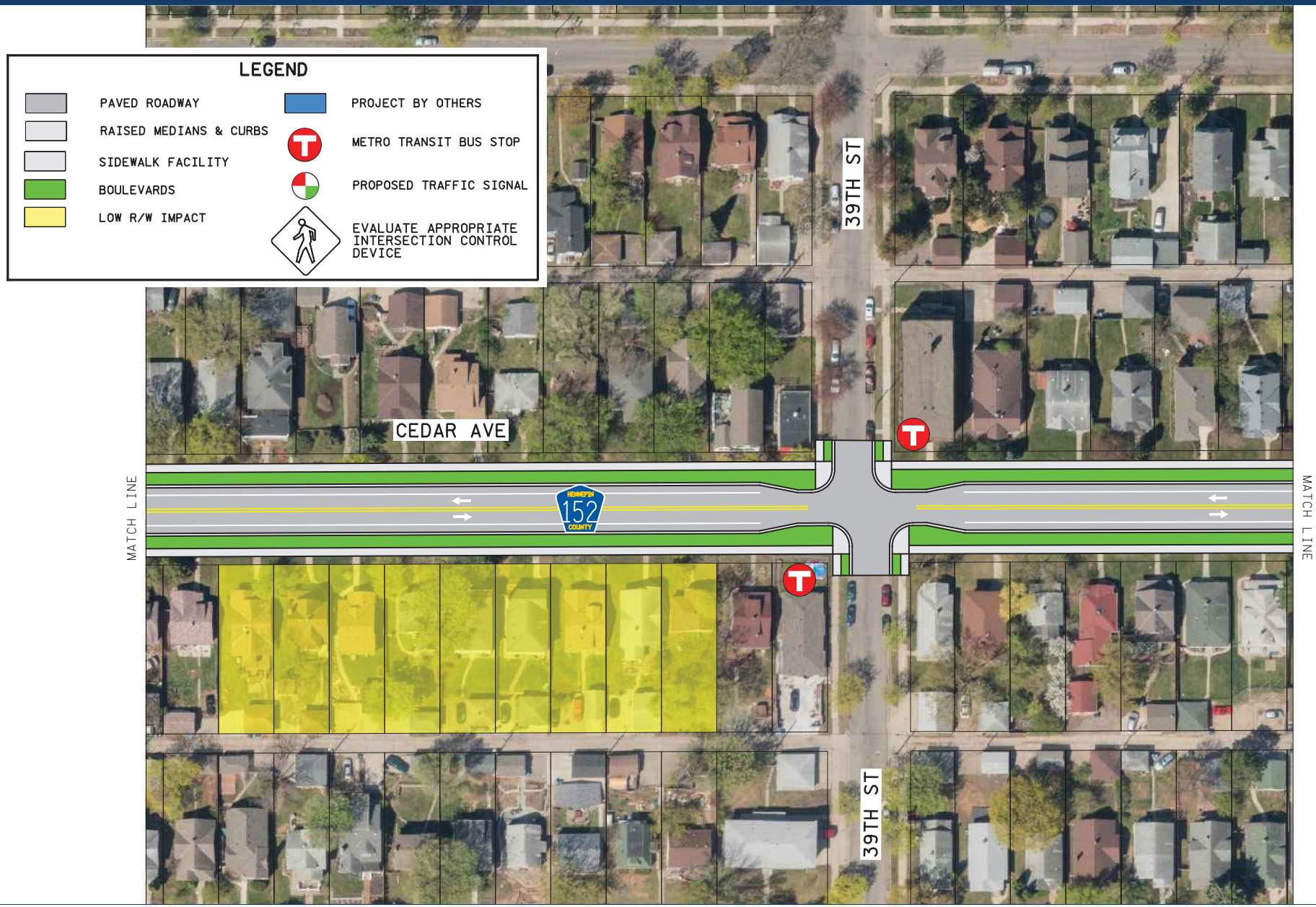
Figure 2

Job #16612
11/3/2023
H:\Projects\16000\16612\TechData\CADDesign\Graphics\CSAH 152 - Cedar Ave\16612_gr02_CSAH 152.dgn

CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 05 | Potential Concept

HENNEPIN COUNTY
MINNESOTA



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SCALE IN FEET

Figure 3

Job #16612
11/3/2023
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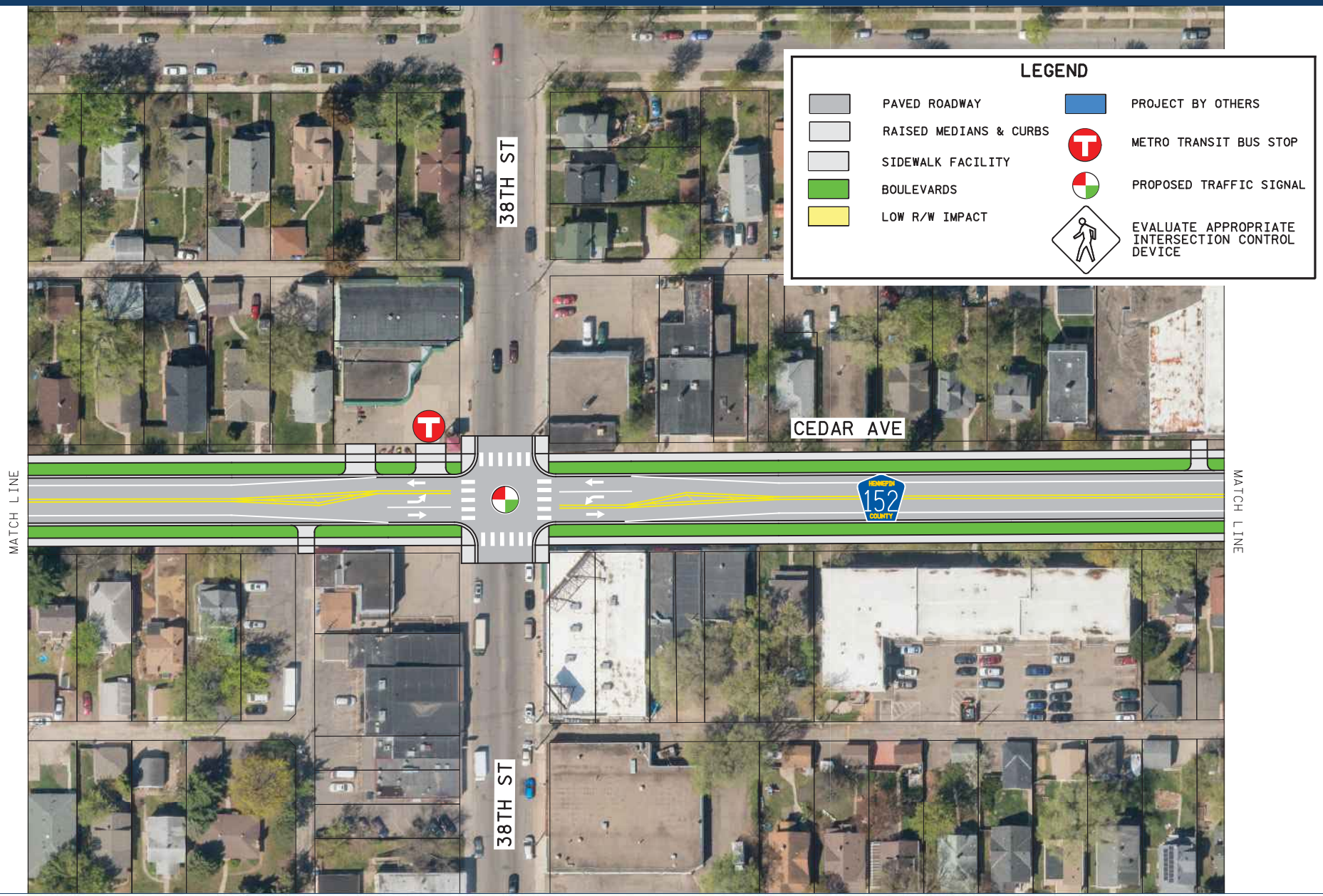
CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 05 | Potential Concept

HENNEPIN COUNTY
MINNESOTA



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SCALE IN FEET

Figure 4

Job #16612
11/3/2023
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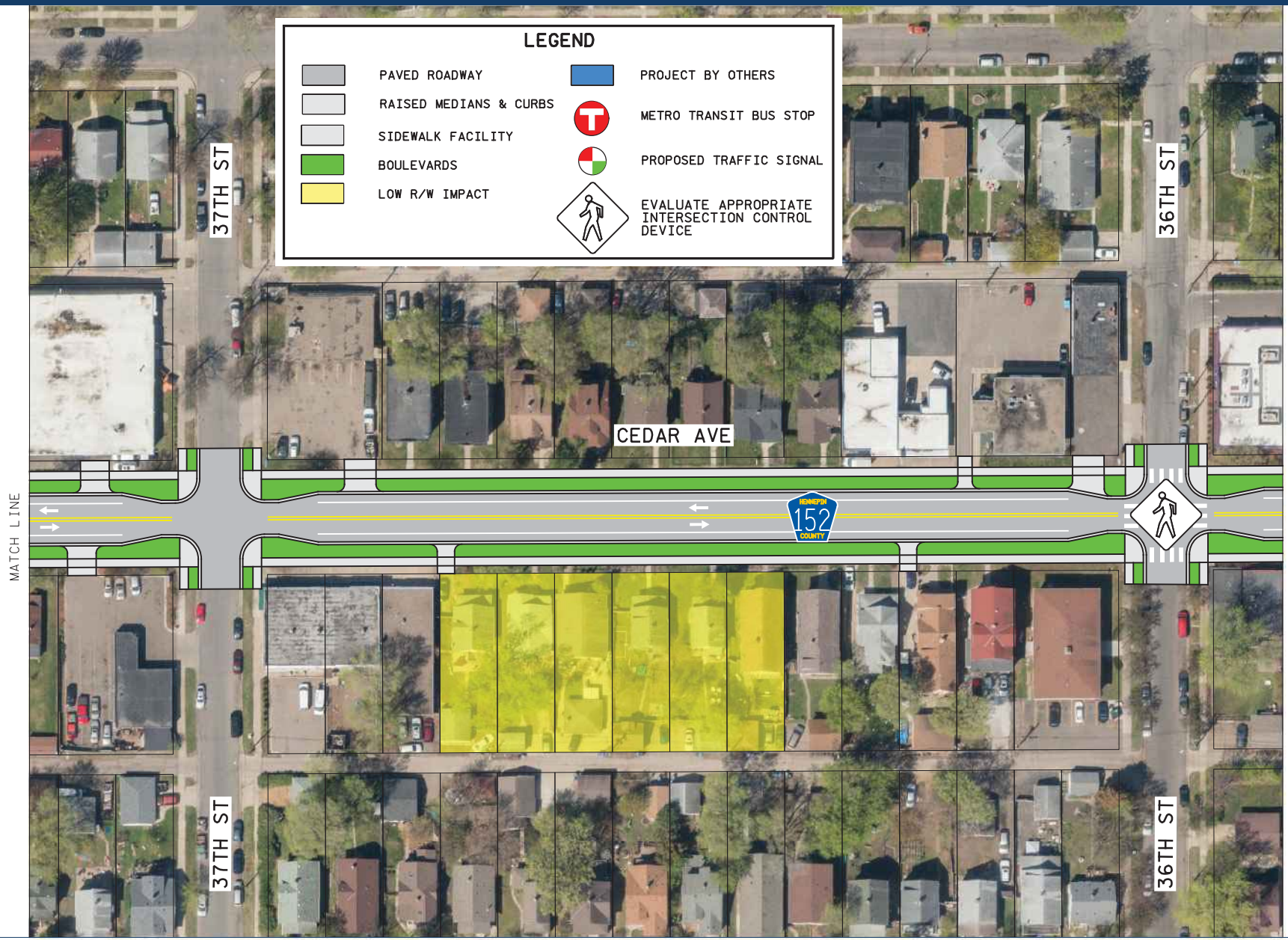
CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 05 | Potential Concept

HENNEPIN COUNTY
MINNESOTA



0 50 100
SCALE IN FEET

Figure 5

Job #16612
11/3/2023
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CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 05 | Potential Concept

HENNEPIN COUNTY
MINNESOTA

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SCALE IN FEET

Figure 6

Job #16612
11/3/2023
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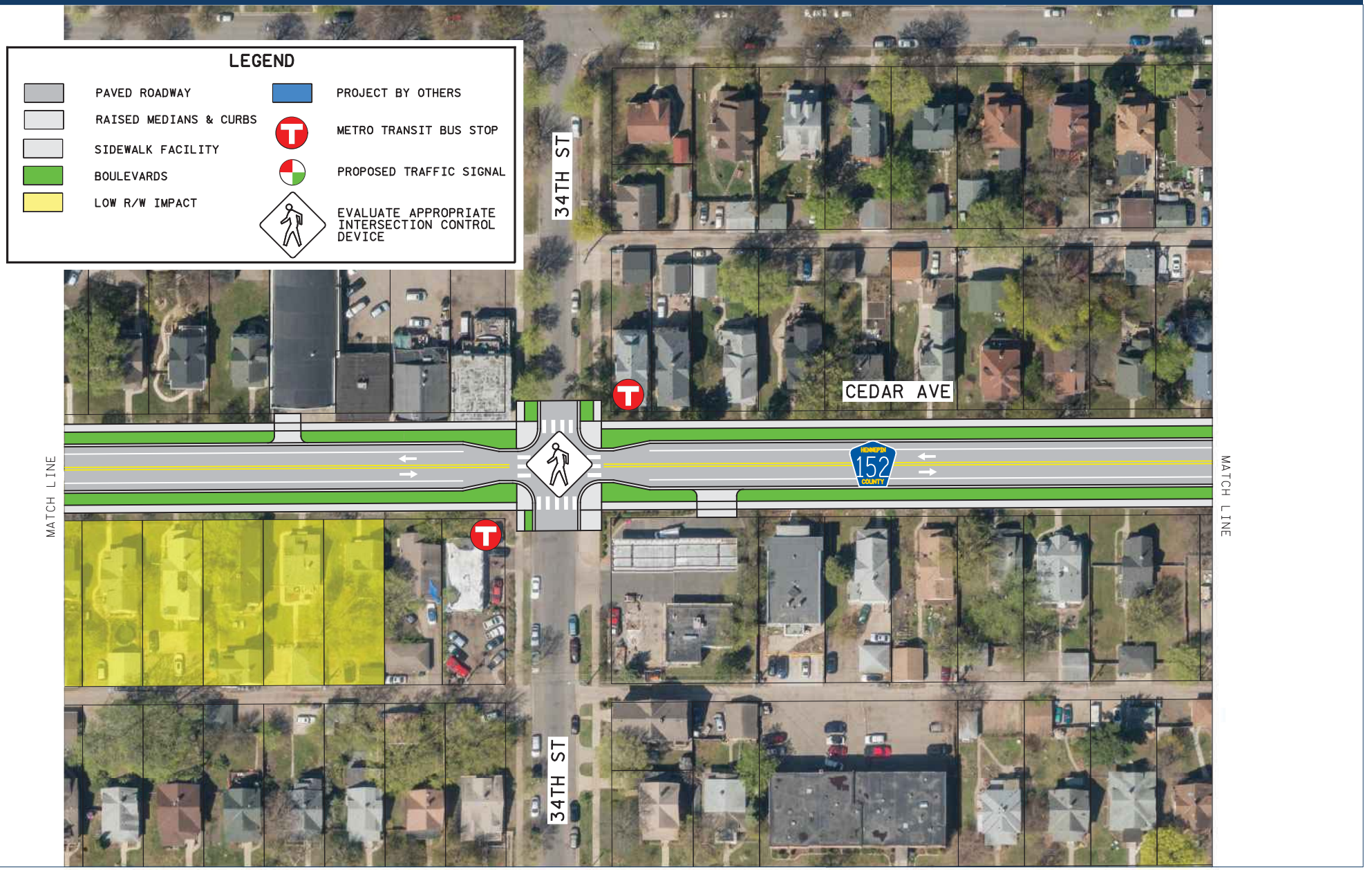
CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 05 | Potential Concept

HENNEPIN COUNTY
MINNESOTA



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SCALE IN FEET

Figure 7

Job #16612
11/3/2023
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CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 05 | Potential Concept

HENNEPIN COUNTY
MINNESOTA

0 50 100
SCALE IN FEET

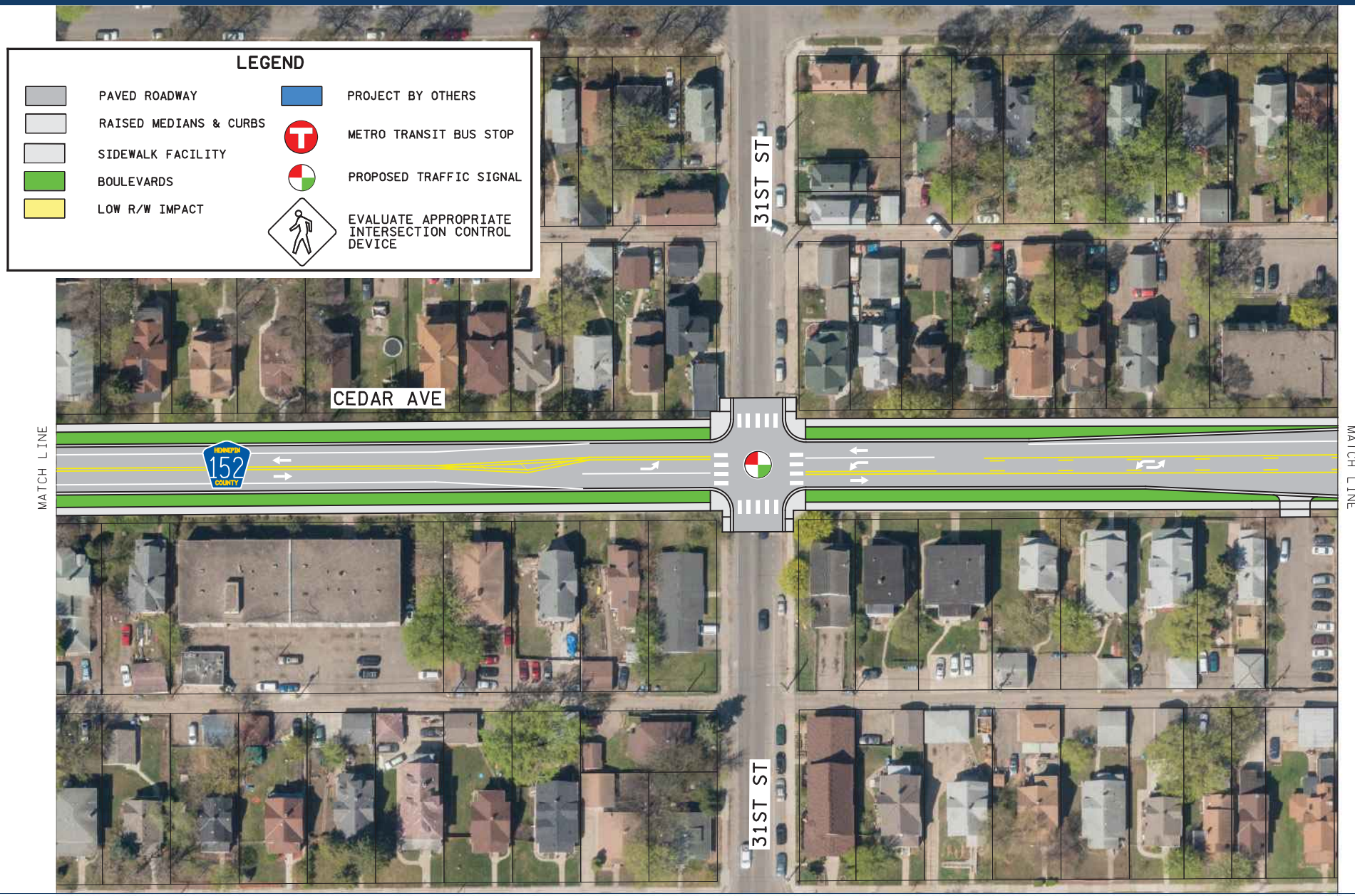
Figure 8

Job #16612
11/3/2023
H:\Projects\16000\16612\TechData\CADDesign\Graphics\CSAH 152 - Cedar Ave\16612_gr08_CSAH 152.dgn

CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 05 | Potential Concept

HENNEPIN COUNTY
MINNESOTA



0 50 100
SCALE IN FEET

Figure 9

Job #16612
11/3/2023
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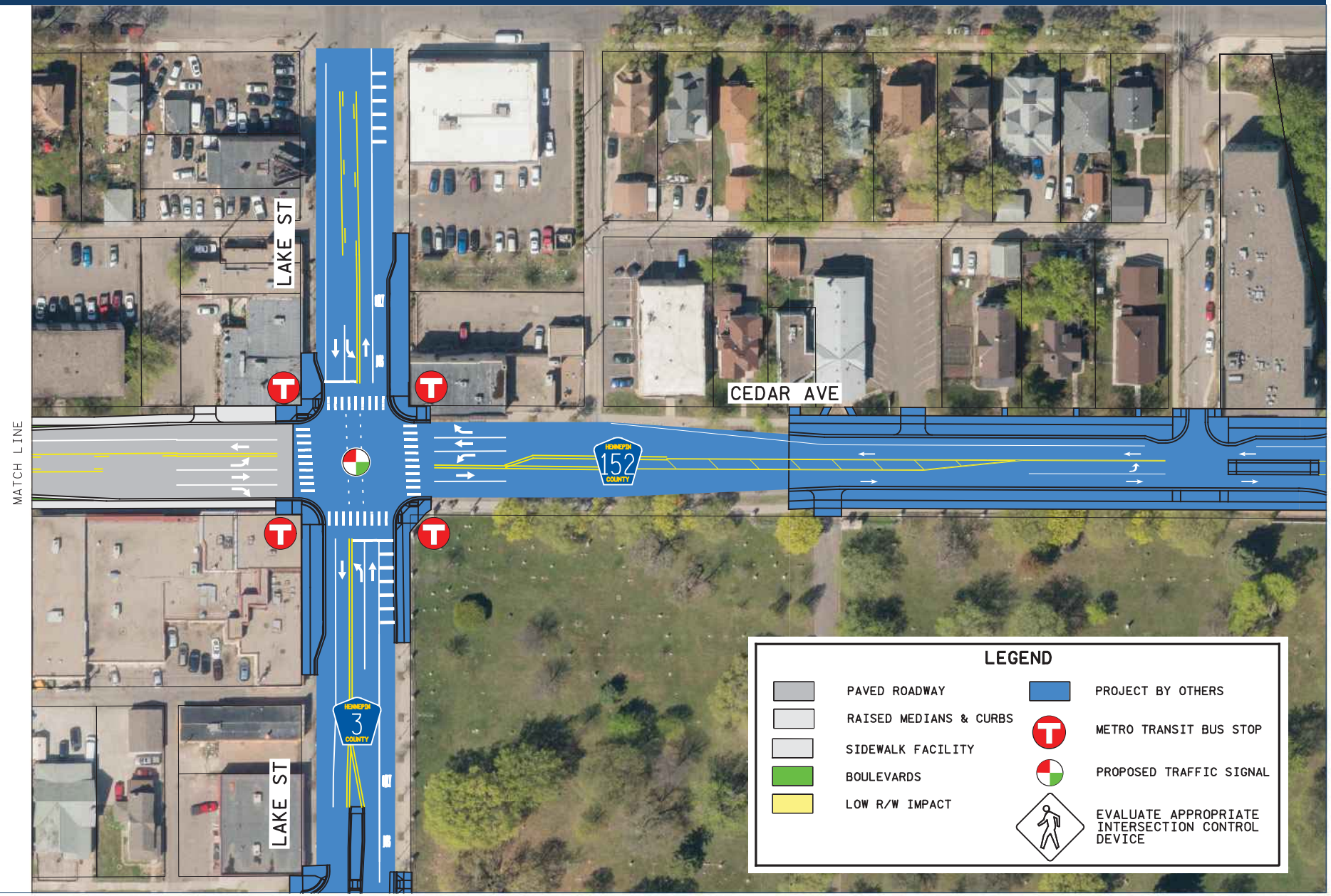
CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 05 | Potential Concept

HENNEPIN COUNTY
MINNESOTA



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SCALE IN FEET

Figure 10

Job #16612
11/3/2023
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CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

List of Attachments

1. Project Narrative
2. Project Location Map
3. Existing Condition Photos
4. Potential Typical Sections
5. Potential Concept
6. Community Engagement Summary
7. Disadvantaged Communities and Resources Map
8. Affordable Housing Access Map and Detail Summary
9. Hennepin County Streetlight Analysis
10. Crash Map and Detail Listing
11. Crash Modification Factors
12. Multimodal Connections Map
13. City of Minneapolis Support Letter
14. Metro Transit Support Letter

CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

HENNEPIN COUNTY
MINNESOTA

Attachment 01 | Project Narrative

Project Name
CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

City(ies)
Minneapolis

Commisioner District(s)
4

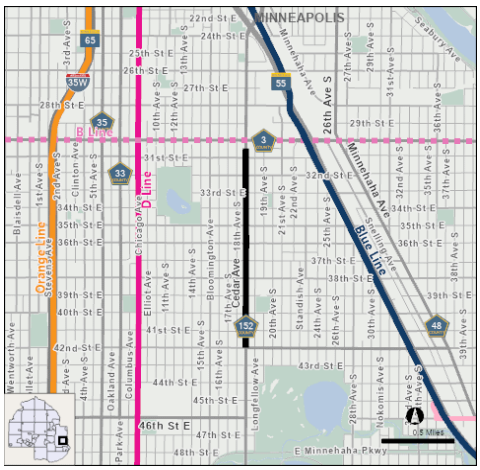
Capital Project Number
Work Plan ID #2229873

Project Category
Roadway Reconstruction

Scoping Manager
James Weatherly

Scoping Form Revision Dates
11/6/2023

Project Map



Project Summary
Reconstruct Cedar Avenue (CSAH 152) from 50' North of 42nd Street (CSAH 42) to 50' South of Lake Street (CSAH 3) in the City of Minneapolis.

Roadway History
The existing roadway (last reconstructed in the 1960s) is nearing the end of its useful life and warrants replacement. Routine maintenance activities are no longer cost effective in preserving assets. The current roadway consists of a 2-lane undivided configuration, on-street parking along both sides, and dedicated left-turn lanes provided at key intersections. A total of seven signalized intersections within the project area, many of which were installed during a time period when proven traffic calming strategies (such as raised medians, curb extensions, and crossing beacons) were not widely accepted as industry standard. In addition, people walking experience challenges when crossing Cedar Avenue (CSAH 152), especially at non-signalized intersections due to limited gaps available in traffic and limited sight distance caused by parked vehicles.

Initial Project Timeline

Scoping:	2023 - 2024
Design:	Q1 2025 - Q4 2027
R/W Acquisition:	Q1 2026 - Q4 2027
Bid Advertisement:	Q1 2028
Construction:	Q2 2028 - Q3 2029

Project Delivery Responsibilities

Preliminary Design:	Consultant
Final Design:	Consultant
Construction Services:	Consultant

Project Description and Benefits
The proposed project will include new pavement, curb, storm water utilities, sidewalk, ADA accommodations, and traffic signals. It is anticipated that each of the seven signalized intersections will be evaluated as part of the project development process to determine the recommended intersection control device. Proven traffic calming strategies (such as raised medians, curb extensions, and streetscaping) will be introduced to not only improve the crossing experiences for people walking, but also to manage the speeds of people driving. In addition, on-street parking will be evaluated as part of the project development process to determine utilization and whether parking can be removed in order to provide additional space for streetscaping. Furthermore, this project will complement Metro Transit's potential Arterial Bus Rapid Transit (ABRT) service that's anticipated to upgrade Route 14 along Cedar Avenue (CSAH 152) as part of Network Next.

Project Budget -		Project Level
Construction:	$	11,650,000
Cost Estimate Year:		2023
Construction Year:		2028
Annual Inflation Rate:		2.0%
Inflated Construction:	$	12,860,000
Design Services:	$	2,570,000
R/W Acquisition:	$	1,710,000
Other (Utility Burial):	$	-
Construction Services:	$	1,030,000
Contingency:	$	3,860,000
Total Project Budget:	**$**	**22,030,000**

Project Risks & Uncertainities
Additional coordination will be needed with Metro Transit as Route 14 is included as a planned Arterial Bus Rapid Transit (ABRT) service as part of Network Next.

Funding Notes
Eligible for federal funding through the Metropolitan Council's Regional Solicitation given the function classification of A-Minor Augmentor.

CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 02 | Project Location Map

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.

N

0 0.5 1 Miles

Publication date: 10/17/2023

Data sources (if applicable):

CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 03 | Existing Roadway Condition Photos

The intersection of Cedar Ave (CSAH 152) and E 34th St is pictured above. This photo shows aging pedestrian and roadway infrastructure as well as non-compliant curb ramps.

The intersection of Cedar Ave (CSAH 152) and E 45th St is pictured above. This crossing lacks ADA compliant pedestrian ramps.

The intersection of Cedar Ave (CSAH 152) and E 32nd Ave is pictured above. Aging infrastructure makes it difficult for people to walk and roll.

The signal system at Cedar Ave (CSAH 152) and 38th St was constructed in 1966 and will be upgraded as part of this project.

Hennepin County Public Works
1600 Prairie Drive, Medina, MN 55340
612-596-0300 | hennepin.us

CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 03 | Existing Roadway Condition Photos

Curb and gutter along Cedar Ave (CSAH 152) is aging and requires repair.

The pedestrian realm will be re-evaluated as part of this project to include green space to separate people walking and rolling from people driving, and new sidewalk assets.

The roadway surface was last reconstructed in 1966 and requires repair.

Hennepin

CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 04 | Potential Typical Sections

Figure 01 | Potential Typical Section along CSAH 152 (Cedar Ave) from 50' North of CSAH 42 (42nd Street) to 31st Street

Figure 02 | Potential Typical Section along CSAH 152 (Cedar Ave) from 31st Street to 50' South of CSAH 3 (Lake Street)

CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 05 | Potential Concept

HENNEPIN COUNTY
MINNESOTA

0 50 100
SCALE IN FEET

Figure 1

Job #16612
11/3/2023
H:\Projects\16000\16612\TechData\CADDesign\Graphics\CSAH 152 - Cedar Ave\16612_gr01_CSAH 152.dgn

CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 05 | Potential Concept

HENNEPIN COUNTY
MINNESOTA

0 50 100
SCALE IN FEET

Figure 2

Job #16612
11/3/2023
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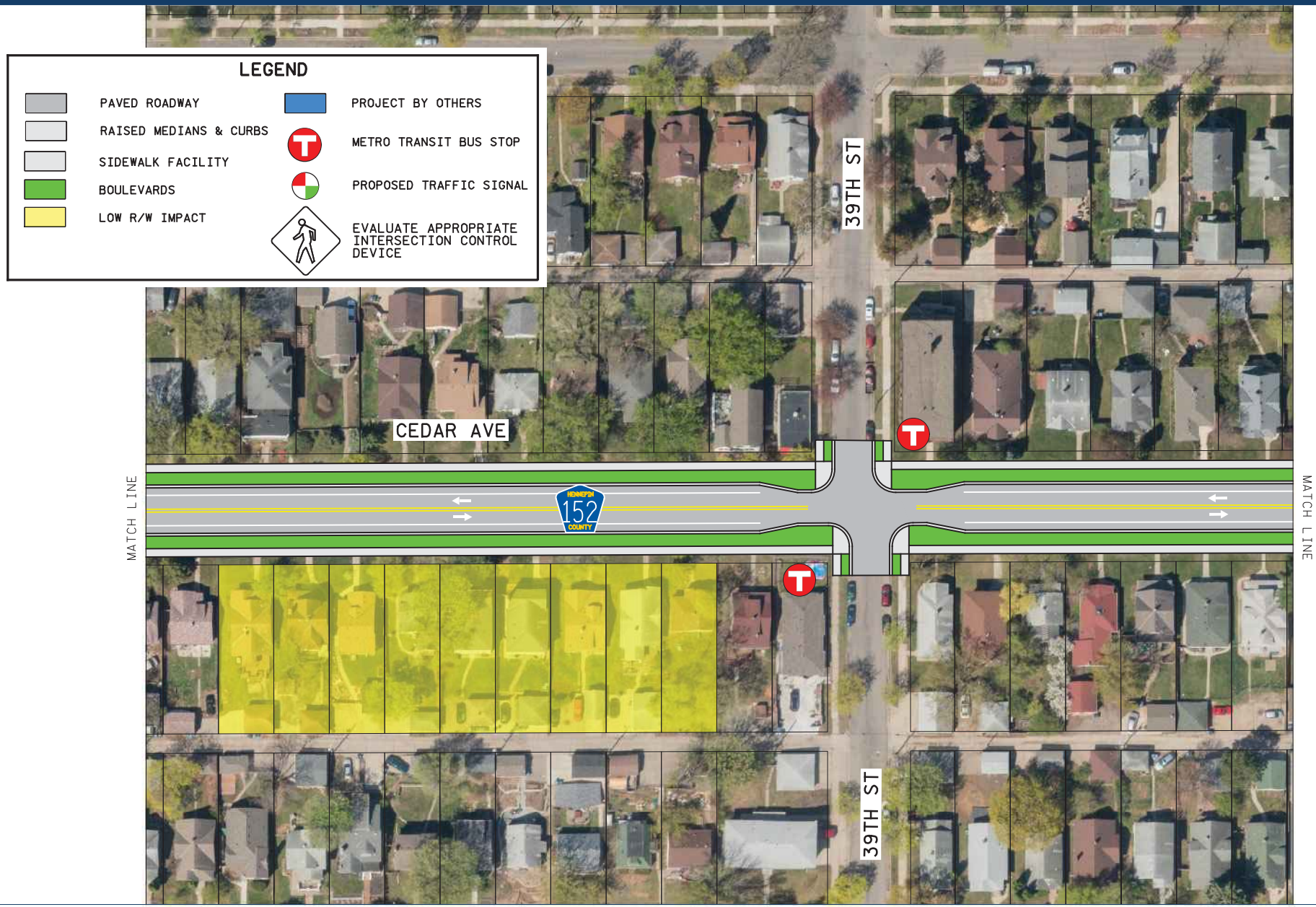
CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 05 | Potential Concept

HENNEPIN COUNTY
MINNESOTA



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SCALE IN FEET

Figure 3

Job #16612
11/3/2023
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CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 05 | Potential Concept

HENNEPIN COUNTY
MINNESOTA

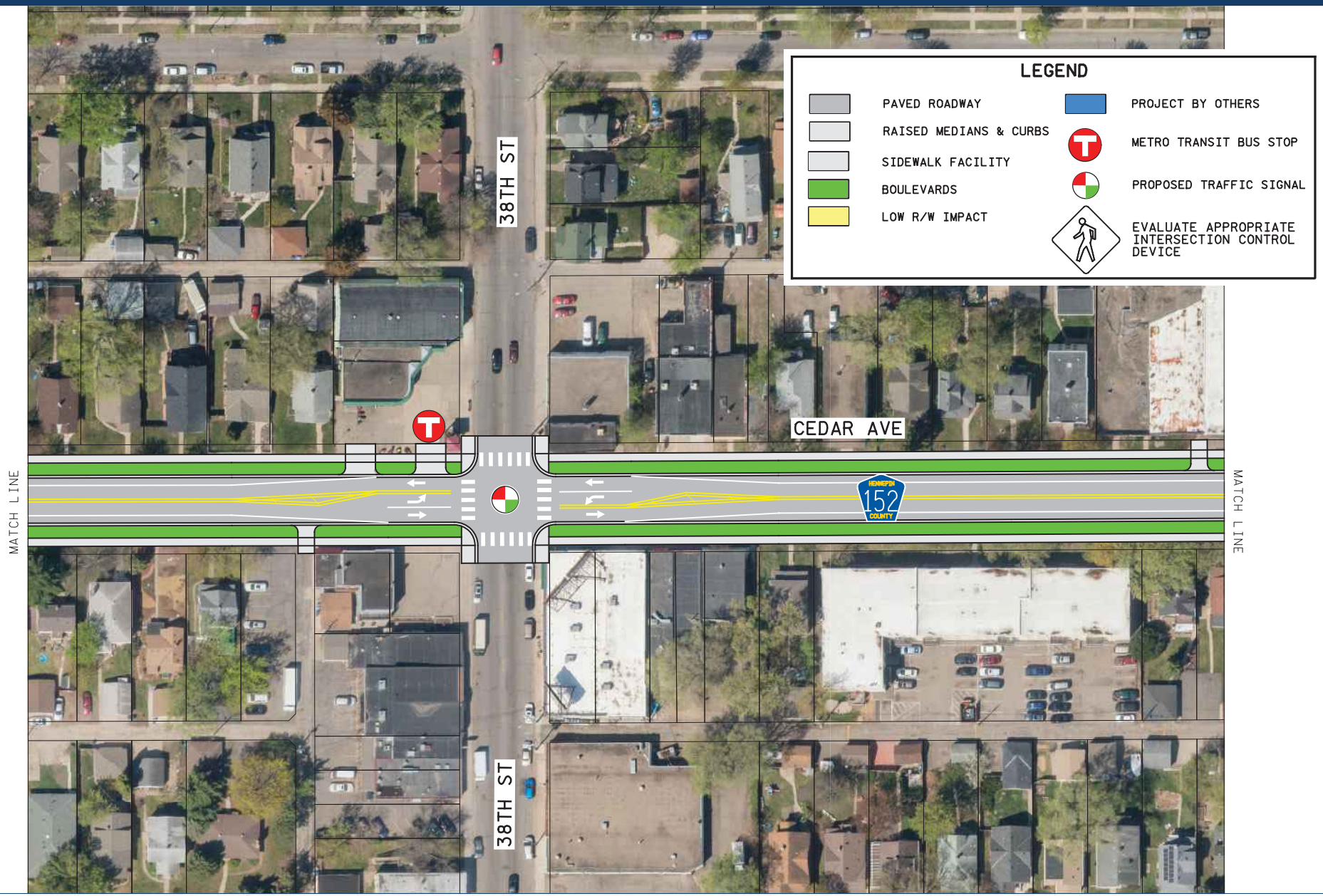

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Figure 4

Job #16612
11/3/2023
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CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 05 | Potential Concept

HENNEPIN COUNTY
MINNESOTA

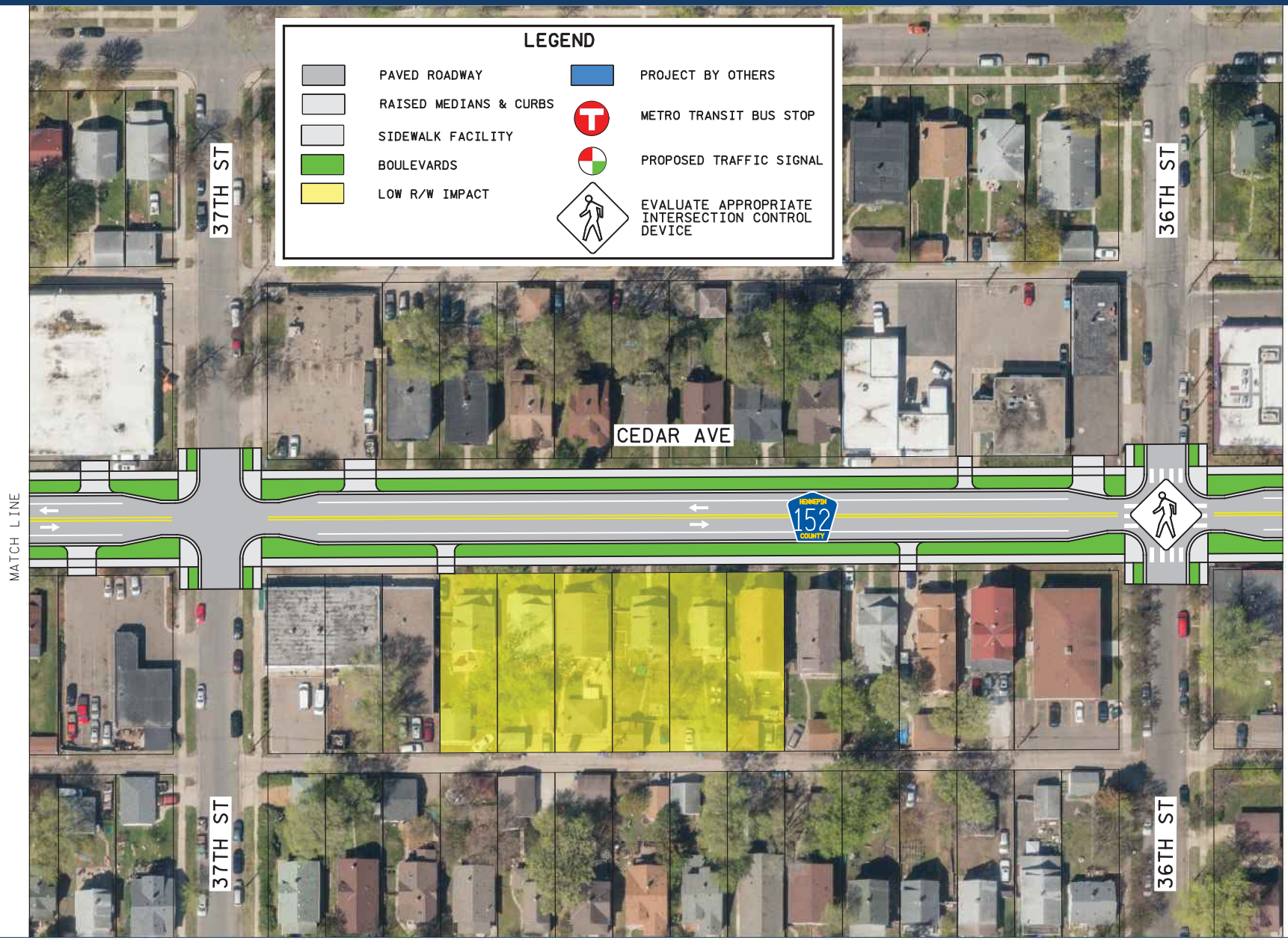

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Figure 5

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11/3/2023
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CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 05 | Potential Concept

HENNEPIN COUNTY
MINNESOTA

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SCALE IN FEET

Figure 6

Job #16612
11/3/2023
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CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 05 | Potential Concept

HENNEPIN COUNTY
MINNESOTA

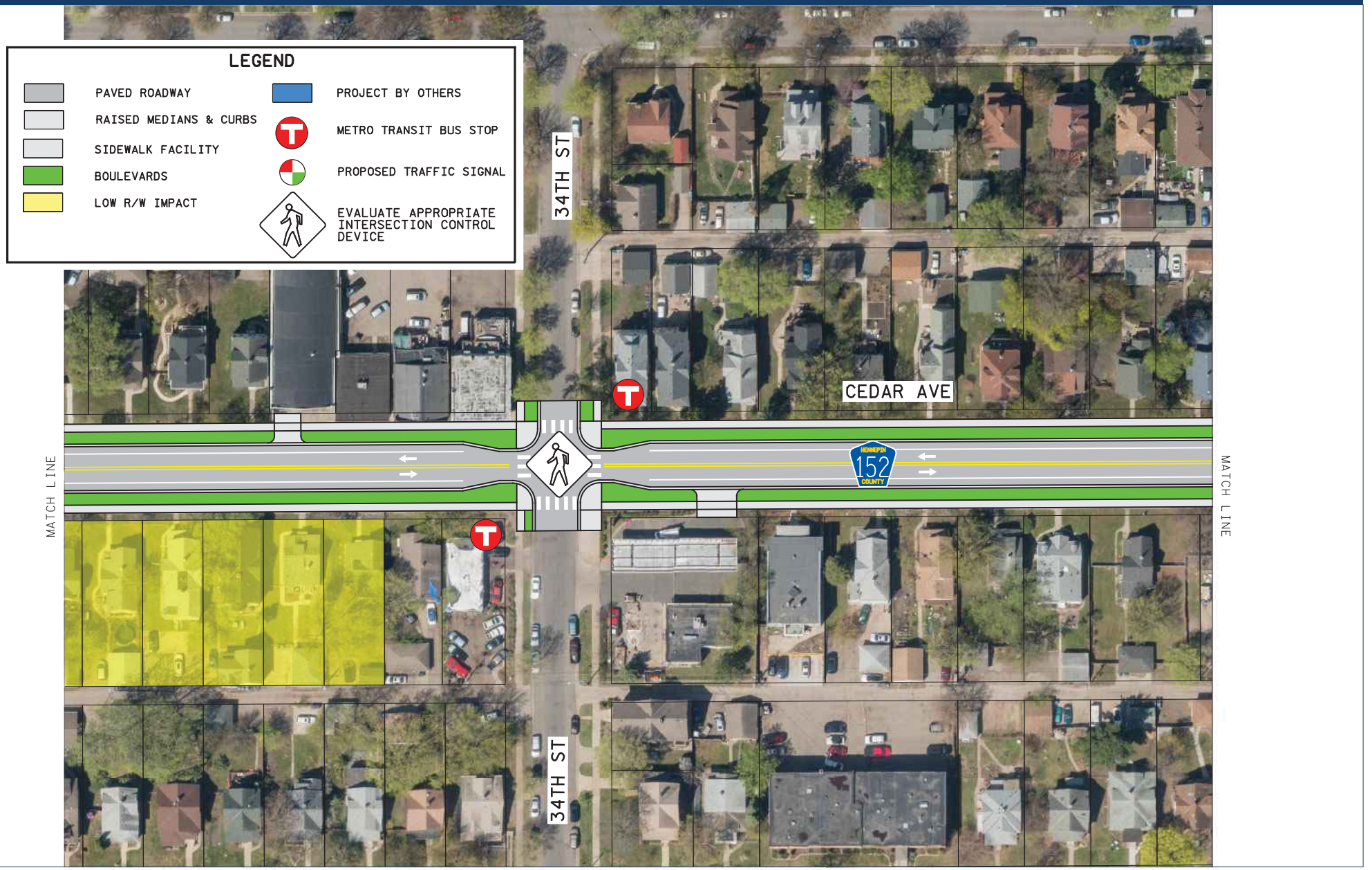

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Figure 7

Job #16612
11/3/2023
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CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 05 | Potential Concept

HENNEPIN COUNTY
MINNESOTA

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Figure 8

Job #16612
11/3/2023
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CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 05 | Potential Concept

HENNEPIN COUNTY
MINNESOTA

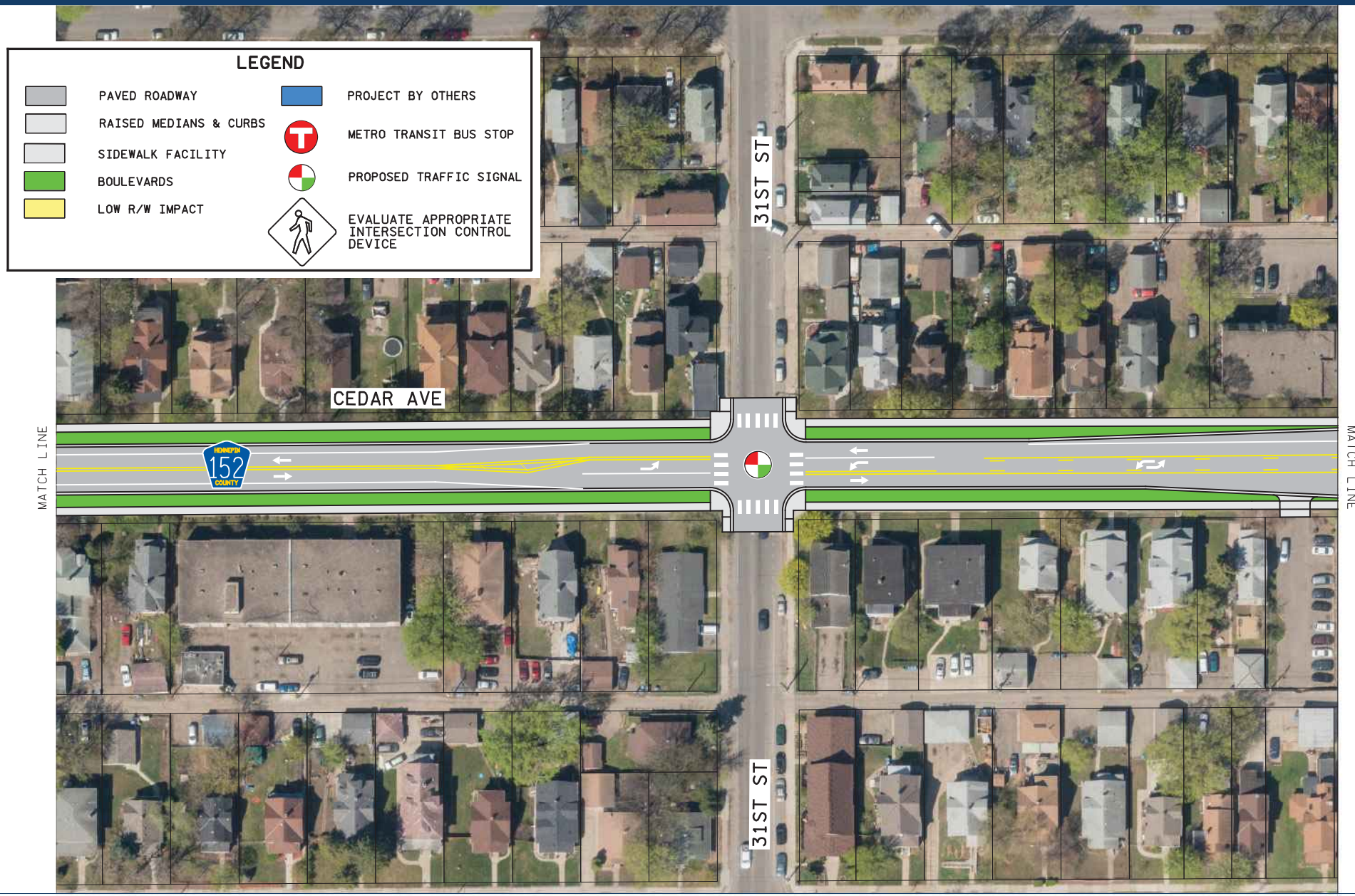

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Figure 9

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11/3/2023
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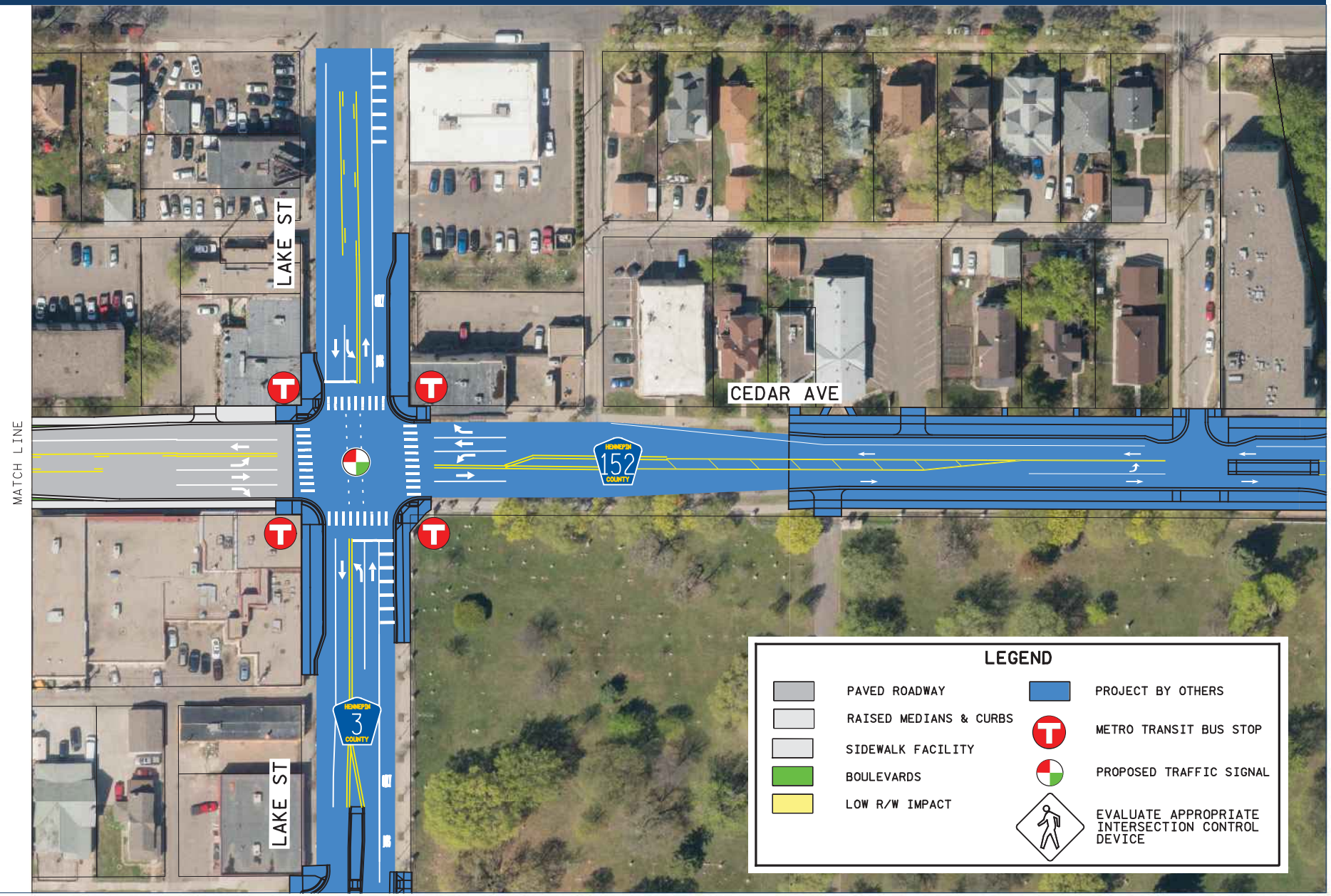
CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 05 | Potential Concept

HENNEPIN COUNTY
MINNESOTA



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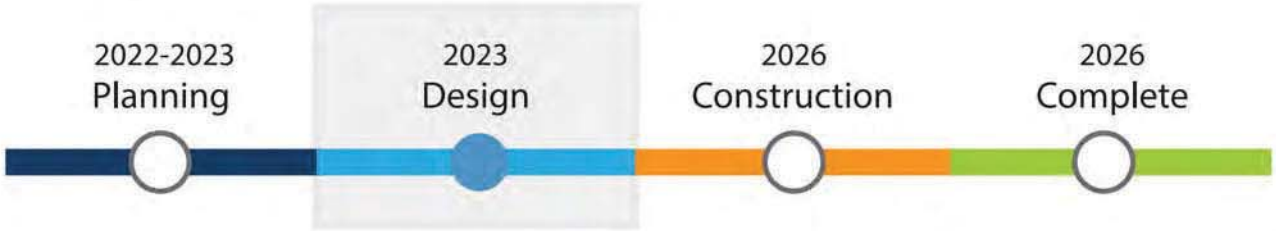
Cedar Avenue reconstruction

Preliminary Engagement Summary - Spring 2023

Project schedule

Timeline is subject to change



Engagement goals

1. Inclusive engagement
2. Multicultural engagement
3. Prioritize community relationships

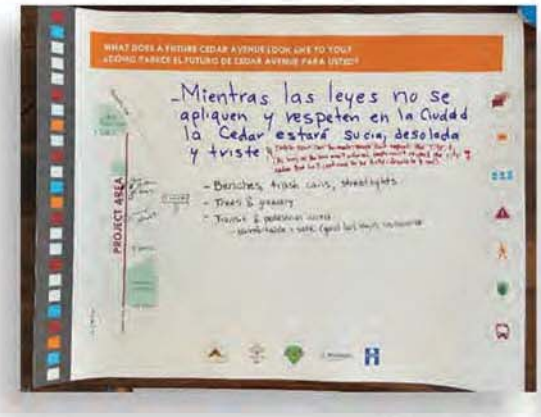
What engagement has occurred?

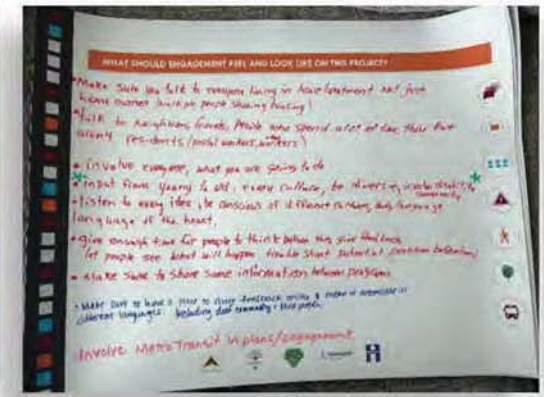
Banyan Community Neighborhood Listening Session
In-person
March 11th

East Phillips Park Corridor Listening Session
In-person
March 21st

Taqueria El Primo Business Listening Session
In-person
March 22nd

Hennepin County is developing a conceptual design for the reconstruction of Cedar Avenue (County Road 152) both *with* the community and *for* the community. During preliminary engagement the county partnered with community based organizations in the Phillips neighborhood with the interest, capacity and expertise in conducting engagement. Little Earth Resident Association, Banyan Community, and the Midtown Greenway Coalition will assist the county with engagement throughout the conceptual design phase.





Photos of engagement events and materials from spring 2023

What we heard

The project team held three **listening sessions**

At each listening session the following questions were asked of participants, in both English and Spanish.

What does a future Cedar Avenue **look like** to you?
What is one thing you would **change** about Cedar Avenue?
What should **engagement look and feel like** on this project?
What else would you like to tell us?

35 community members contributed...

146 unique comments.

These translated to **314** feedback points...

...within **14** community themes.

The graphic below shows a breakdown of comments by community theme:

Listening session themes (spring 2023)

More than half of participants' feedback centered around road design, safety, and community wellness. Within each of these themes are key **feedback points** that address design elements, transportation safety concerns or general wellness of the Phillips neighborhood. Here are examples of feedback points grouped by community themes.

Approach to summerizing feedback

Feedback at the listening sessions was very diverse and touched on several different themes. In selecting direct community quotes, we sought to represent community feedback accurately by highlighting this range of input. Our approach for choosing examples of these themes was as follows:

- Aim to not overrepresent a specific type of comment within each theme
- Select comments from community members that staff had extensive conversations with at community events
- Provide minimal grammar and language adjustments to the format of public comment

Road design

- Reduce "stop and go" traffic
- Improve operations of intersecting one-way streets on 26th and 28th
- Reduce speeding
- Simplify the 28th Avenue intersection
- Reduce general and large vehicle traffic

Safety

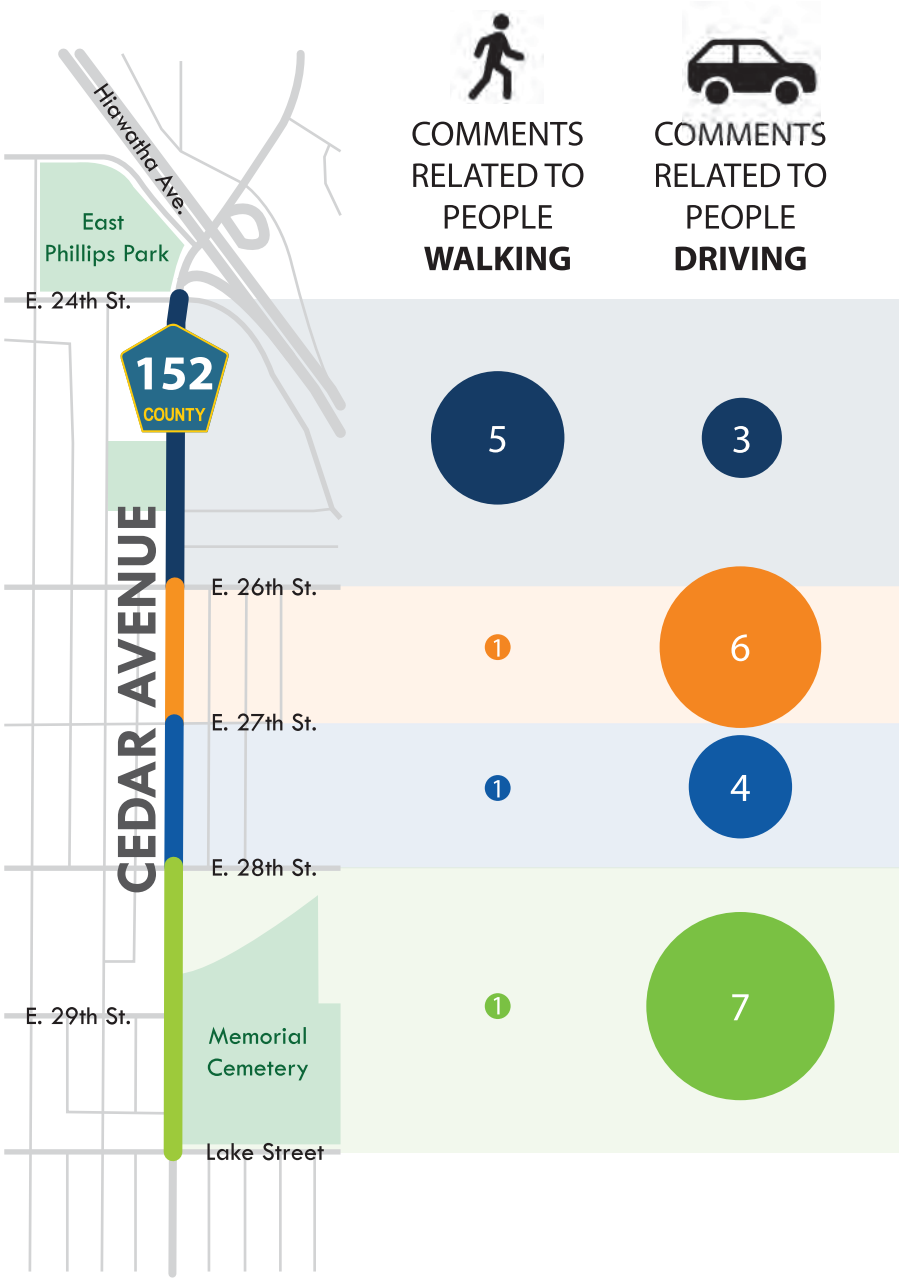
- Improve pedestrian crossings
- Increase greening, lighting, and beautification (positive impact on pedestrian safety)
- Improve clarity of signage
- Reduce vehicle speeds
- Improve safety at bus shelters, the Little Earth pedestrian bridge, and at night

Community wellness

- Improve safety and security of businesses and parked cars
- Reduce pollution in neighborhood - reoccuring mentions of nearby businesses: Bituminous Roadways, and Smith Foundry
- Reflect community character along the corridor
- Reduce or remove large truck traffic

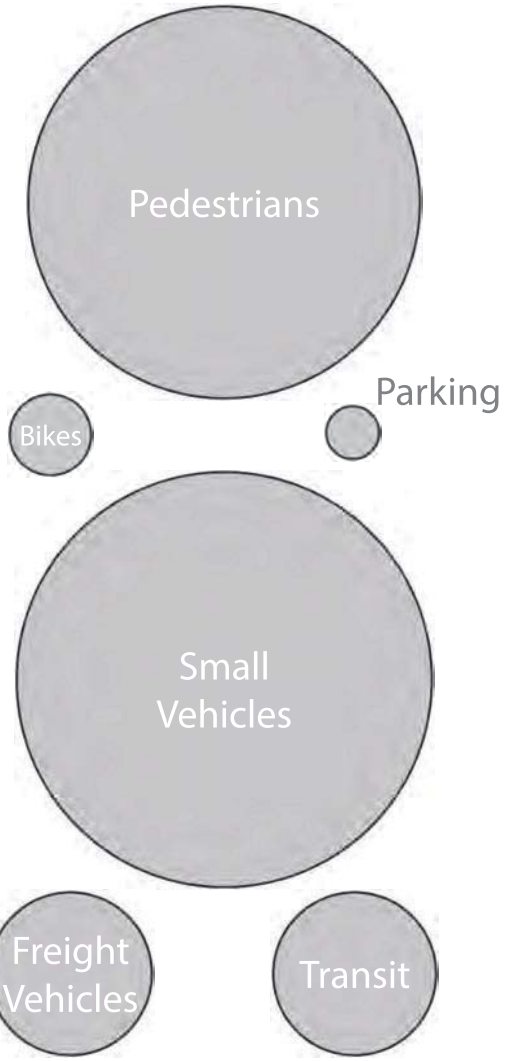
Locational feedback

The following map shows the number of community comments that relate to a specific geographic location on the corridor:



GENERAL CORRIDOR COMMENTS

The graphic below shows the relative number of comments by mode that were not specific to a location on Cedar Avenue:



How to stay involved

Spring and summer engagement

As the project moves into the first phase of conceptual design, we will host future opportunities to gather stakeholder feedback from a diverse audience in the community.

Pop-up engagement events
The team will take engagement to the streets through pop-up events. Many people walk, bike, and use transit in this area. Pop-ups provide opportunities to meet community members where they are and engage with them personally.

Focus groups
The engagement team will host several focus groups to engage with specific audiences and solicit feedback from communities that are traditionally underrepresented at engagement events.

Public workshops
There will be two public workshops on the project. These workshops provide the largest forum for members of the community to collaboratively provide input on the project.

Contact

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Project manger
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Trey Joiner
Engagement manager
Office: (612) 474-0037

Need more information or would like to attend an event? Email us at **cedaravenue@hennepin.us**

Want to learn more? Visit the project website at *hennepin.us/cedar-avenue*

Cedar Avenue reconstruction

Phase 1 engagement summary

Engagement events

Hennepin County hosted several engagement events to continue developing a conceptual design for the reconstruction of Cedar Avenue (County Road 152) both *with* the community and *for* the community. Community stakeholders were invited to share their perspectives at the following events and through an online survey:

Midtown Greenway tent
Open Streets
June 10th

Phase 1 online survey
Online
July 10 - August 9

Little Earth United Tribes Gym
phase 1 workshop
In-person
July 20th

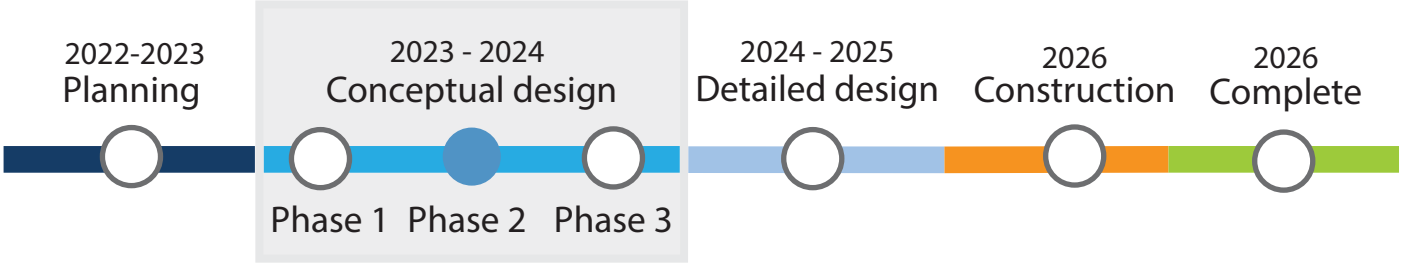
Photos from engagement events and engagement materials from Summer 2023

Themes and goals

Throughout preliminary and phase 1 engagement, feedback from the community was organized into general themes. The top three themes include street safety, community wellness and cultural character. We will be updating our project goals to align better with these community themes as we move into later phases of engagement. Information in this engagement summary includes a report back of phase 1 feedback collected from surveys, popups and the community workshop on July 20.

Project schedule

Timeline is subject to change



Pop up and online feedback

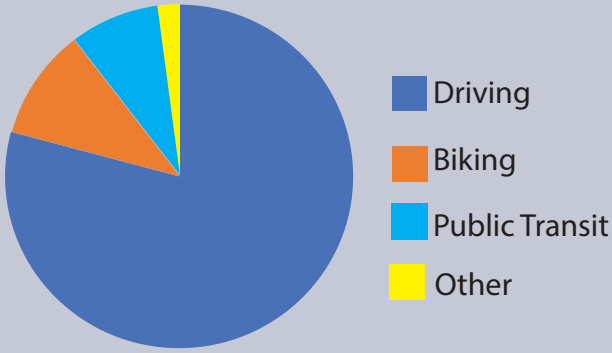
SURVEY

48
survey responses

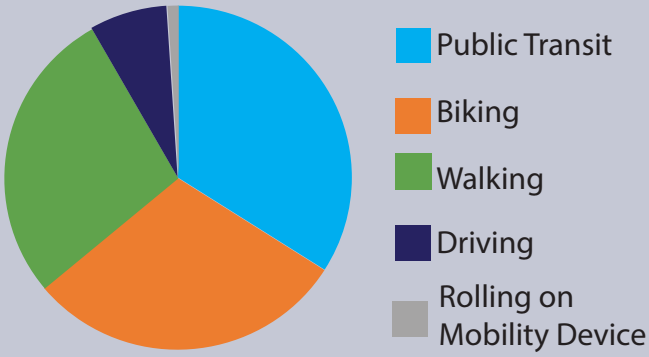
68%
of respondents live within the Cedar Avenue corridor

89%
of survey respondents identify as White or Caucasian

How you currently travel



How you want to travel

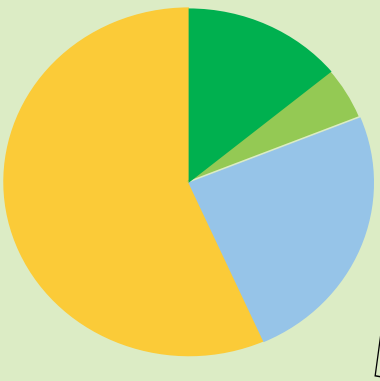


OPEN STREETS

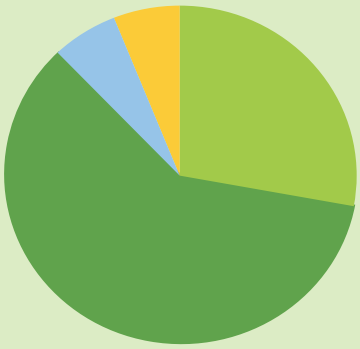
67
responses at Open Streets

Open Streets East Lake is an annual event on various streets across the city. Tabling activities at the intersection of Lake Street and Cedar Avenue included asking attendees about their connection to the area, how they travel on Cedar Avenue, and how they'd like to travel in the future.

How you currently travel



How you want to travel



Workshop feedback

WORKSHOP

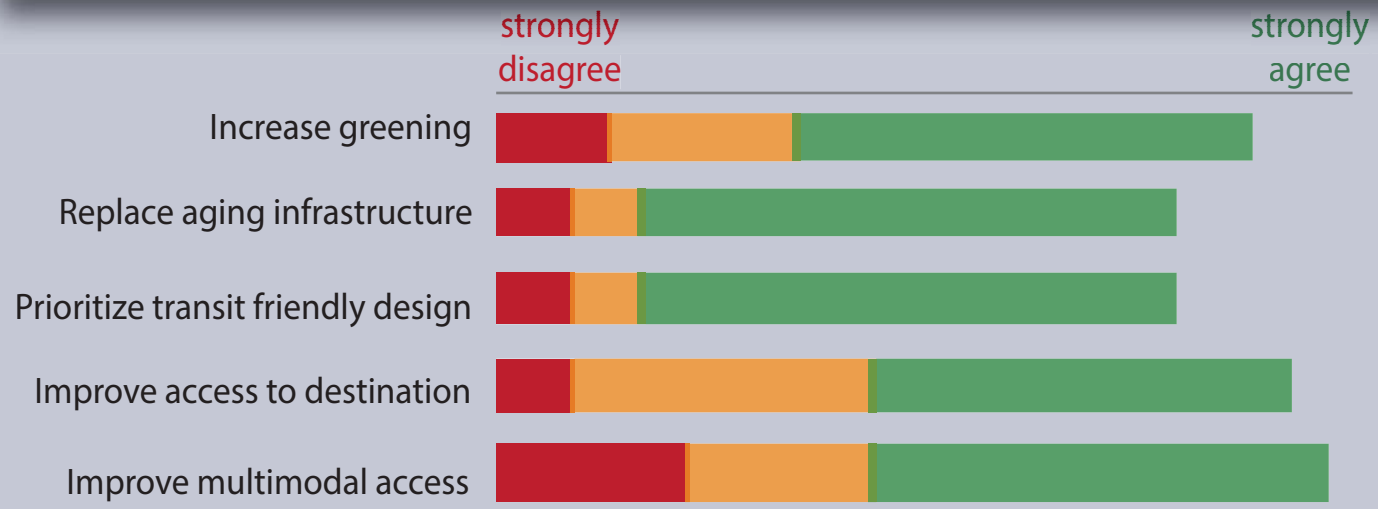
102 participants at the workshop

74% of participants live within the Cedar Avenue corridor

70% of participants identify as American Indian or Native American

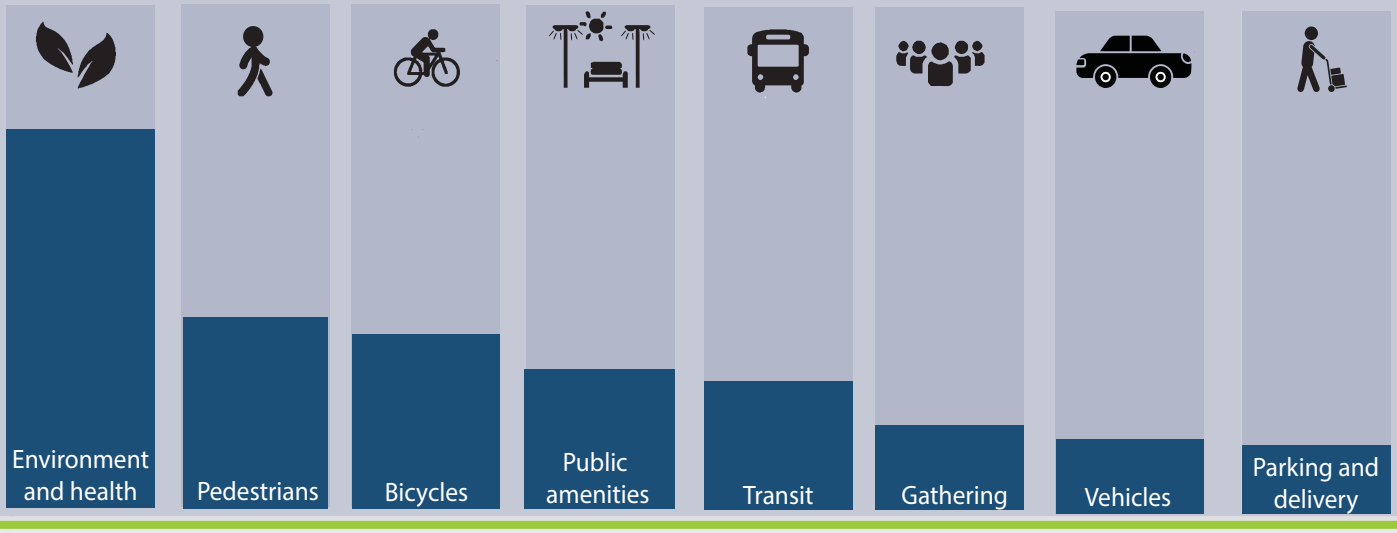
Goal alignment

Based on the feedback detailed below from phase 1, along with preliminary feedback, the project team will change project goals. The planning team is working to make sure the project aligns with the goals supported by the community as we move forward through process

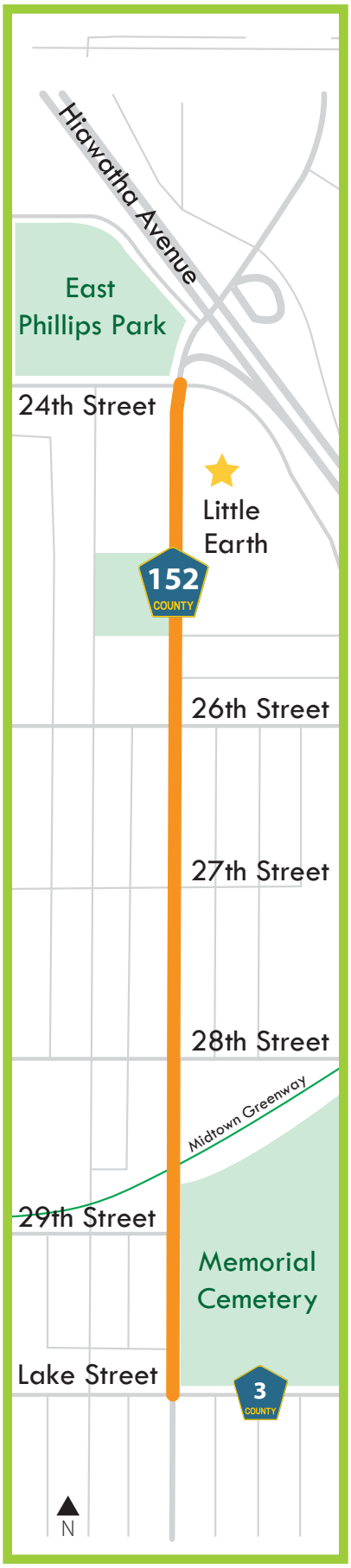


Marble prioritization

The marble prioritization activity was used to determine which design elements the community would like to see prioritized. The eight categories and their level of prioritization from the workshop are detailed below.



Workshop commennts grouped by location



The following map shows the most reoccuring community feedback received during the community workshop on the July 20, that relates to a specific location on the corridor:

North of 24th Street

- Dangerous driver behaviors such as, speeding, ignoring signals, and running red lights

Little Earth Crosswalk

- Little Earth crosswalk should be enhanced (street lights, wider markings, flashers, signal timing) and need to reduce the noise of loud traffic on the street
- Need for benches and bus shelters at Little Earth

East 25th Street to 26th Street

- Dangerous driver behaviors such as speeding. Lower speed limits, increased signage, and speed bumps suggested
- Limited field of vision for drivers turning into Omega Place

26th Street and Cedar Avenue

- Confusion due to 1-way to 2-way change at Cedar
- Dangerous behaviors from drivers such as speeding, ignoring signals, and running red lights

26th Street to 27th Street

- Difficult for pedestrians to cross. Drivers frequently run red lights
- Confusion due to the one-way and frequent back ups due to mistimed signal

27th Street and Cedar Avenue

- Parking takes up a lot of the street, difficult to drive with so many parked cars
- Bus shelters and separated bike lanes desired

27th Street to 28th Street

- Difficulty in accessing parking along busy street
- Need for bus shelters and separated bike lanes specifically mentioned

28th Street and Cedar Avenue

- Difficult for pedestrians to cross 28th
- Need thorough snow and ice clearing at bus stops in winter

28th Street to East 29th Street

- Desire for bike path or connection to Midtown Greenway
- Need for additional pedestrian lights, and more public street lighting

29th St. to Lake Street

- Desire for slower speeds make pedestrians with children comfortable

Street and Cedar Avenue

- Concerns with dangerous driving behaviors

WORKSHOP

Engagement goals

The public engagement vision is to connect with community and stakeholders to generate project interest, build rapport, and facilitate a high level of participation in understanding and shaping the project. We plan to realize this by using the following goals-based approach to public engagement.

1. Inclusive engagement
2. Multicultural engagement
3. Prioritize community relationships

Throughout conceptual design the county is partnering with community based organizations in the Phillips neighborhood with the interest, capacity and expertise in conducting engagement. Little Earth Resident Association, Banyan Community, and the Midtown Greenway Collation will assist the county with engagement to help deliver on our engagement goals.

Upcoming engagement

Pop-up engagement events
The team will take engagement to the streets through pop-up events. Many people walk, bike, and use transit on and around Cedar Avenue. Pop-ups provide opportunities to meet community members where they are and engage with them personally.

Focus groups
The engagement team has and will host several focus groups to engage with specific audiences and solicit feedback from communities that are traditionally underrepresented at engagement events.

Public workshops
There has been and will be one more public workshop on the project. These workshops provide the largest forum for members of the community to collaboratively provide input on the project.

Contact

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Engagement Manager
Office: (612) 474-0037

Need more information or would like to attend an event? Email us at **cedaravenue@hennepin.us**

Phase 2 engagement summary

Background

Hennepin County hosted several engagement events in the fall of 2023 to continue to develop a conceptual design for the reconstruction of Cedar Avenue (County Road 152). The second phase of engagement involved reporting back to the community what was learned in Phase 1, gathering input on the updated project goals and gaining insight into community priorities for the roadway through a cross section puzzle exercise.

Engagement events

Engagement events for Phase 2 included the following:

National Night Out
August 7

Greenway Glow pop up
September 9

Corridor residents focus group
September 12

Little Earth focus group
September 18

Spanish language focus group
September 14

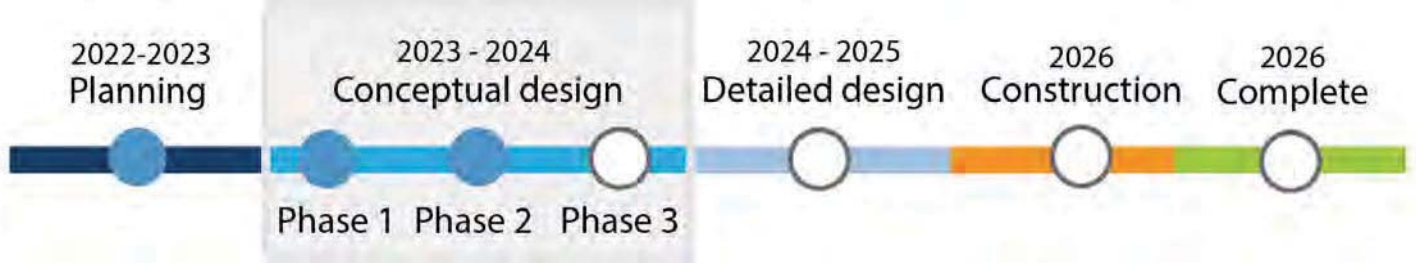
Business focus group
September 14

Public workshop
September 21

Cedar Clean Sweep
October 9

*Overall, the project team engaged with about **165** people at engagement events.*

Project schedule



Reporting back: Corridor priorities

During Phase 1, the public voted on priorities for the corridor. Environment and health was by far the highest priority, followed by pedestrian safety.. These top two priorities were affirmed in the cross section exercise of Phase 2. Boulevards/green space and wide sidewalks were a priority in street designs.

Reporting back: Project goals

Seeking to align with feedback heard in Phase 1, the project team adjusted the project goals to better align with the community's vision for the street and agency policy guidance. This involved providing clarity to existing goals and adding two additional goals. Moving forward, the project team will apply these goals and balance their trade-offs as conceptual roadway designs are developed. Overall, community members supported the changes made to the project goals.

Past goal	Updated goal
Improve access to destinations	**Make it easier to access nearby community destinations including parks, trails and local businesses**
Improve multimodal access Prioritize transit friendly design	**New combined goal: Make it more comfortable for people walking, biking, rolling and using transit along the corridor**
Replacing aging infrastructure	**Replace and modernize aging infrastructure such as traffic signals and stormwater facilities**
Increase greening	**Preserve existing tree canopy and increase greening along the corridor**
Added: Community goals	**Build a road for today and tomorrow that reflects the community's values** **Design a livable, calmer, safer street**

Focus group feedback

The main activity in Phase 2 was a cross section exercise, which asked participants to build their ideal street first with an 80-foot right of way, and then again with a smaller 64-foot right of way. This exercise helps both participants and project staff examine priorities for the street.

- Boulevards/green space was prioritized by almost all groups.
- Wide sidewalks were preferred by many participants.
- Many who added furnishing zones alongside the sidewalks mentioned the need for lighting in the corridor.
- There was strong support for bike lanes, especially from Cedar Avenue residents, noting the connection to the Midtown Greenway.
- The Little Earth and Spanish language focus groups prioritized bus lanes, as did about half of public workshop participants.
- Overall, parking was not a priority, except for businesses.

Street priorities differed slightly across the four focus groups:

- **Corridor residents:** Strong support for bike lanes from residents. Overall desire to reduce traffic congestion and traffic speeds. Two of the three groups included parking on the west side.
- **Corridor businesses:** All groups included parking on both sides of the street. Both groups kept bike lanes in their designs, noting the connection to the Midtown Greenway.
- **Banyan Community Center (Spanish language):** All three groups included dedicated bus lanes. Two of the three groups kept bus lanes even in the 64-foot version.
- **Little Earth Residential Association:** All groups included southbound bus lanes. No groups included parking.

Cedar Avenue business representatives complete the cross section activity at a focus group.

Corridor residents

Corridor businesses

Banyan Community Center (Spanish language)

Little Earth Residential Association

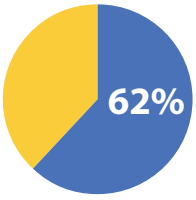
Example of a completed cross section activity from each focus group.

Workshop feedback

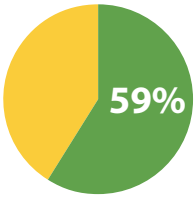
The project team hosted a public meeting/workshop on Thursday, September 21 at Little Earth Residents Association. The event drew about 135 people.

Demographics

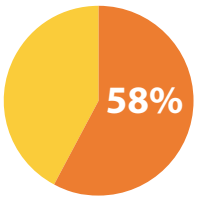
Demographic information was voluntarily collected at this event:



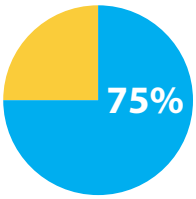
Lived on or close by Cedar Avenue



Were American Indian/Native American



Identified as female



Represented zip code 55404

Project partners engage with public meeting attendees.

Cross section exercise

32 open house attendees completed the cross section puzzle activity resulting in 55 unique roadway designs.

Sidewalks

Present in all designs. Participants generally preferred wider sidewalks.

Boulevards/green space

Other than sidewalks and drive lanes, boulevards/green space was included the most often, appearing in about 70% of designs.

Bike lanes

Appeared in 84% of the 80-foot designs and 65% of the 64-foot designs. The usage of two bike lanes was higher than the use of one.

Parking

Was not prioritized by this group, only appearing in about a quarter of the 80-foot designs and 12% of the 64-designs.

Transit (bus) only lane

At least one dedicated transit lane was included in 64% of the 80-foot designs and 46% of the 64-foot designs.

Turn lane

Appeared in about 20% of 80-foot designs and only 12% of 64-foot designs.

Pedestrian zones

Furnishing zones–or areas for elements such as street furniture, lighting and bicycle parking–were in about 30% of designs, prioritized over parking, transit shelters, turn lanes, and café seating. Anecdotally, when furnishing zones were added by participants, conversation with staff indicated that lighting (primarily) and seating (secondarily) were desired in this area.

Engagement goals

The public engagement vision is to connect with community and stakeholders to generate project interest, build rapport, and facilitate a high level of participation in understanding and shaping the project. We plan to realize this by using the following goals-based approach to public engagement.

1. Inclusive engagement
2. Multicultural engagement
3. Prioritize community relationships

Throughout conceptual design the county is partnering with community-based organizations in the Phillips neighborhood with the interest, capacity and expertise in conducting engagement. Little Earth Resident Association, Banyan Community, and the Midtown Greenway Collation will assist the county with engagement to help deliver on our engagement goals.

Upcoming engagement

Phase 3 engagement

Alternative designs will be presented for public input. Expect more information in early 2024.

Contact

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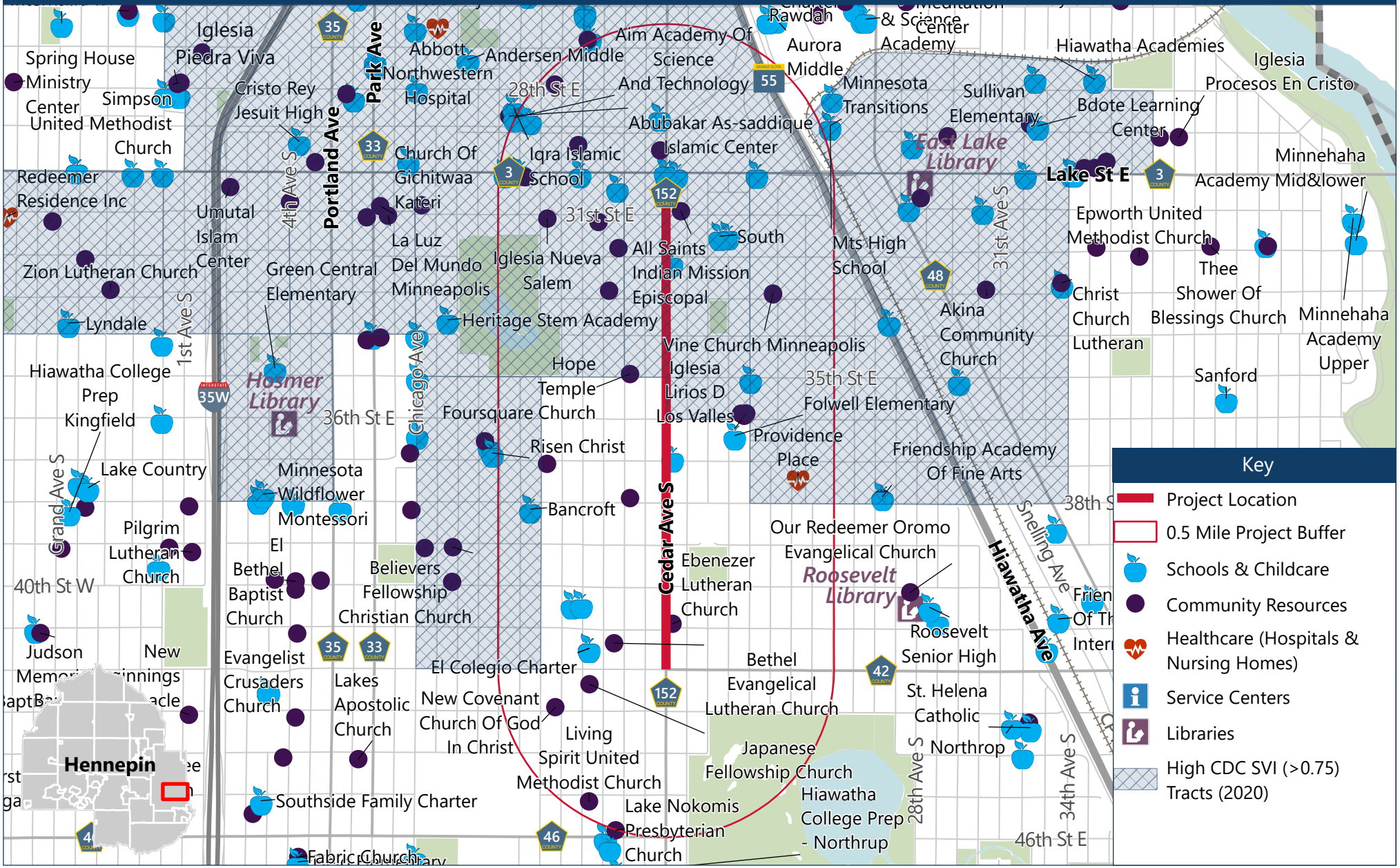
Need more information or would like to attend an event? Email us at **cedaravenue@hennepin.us**

CR 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 07 | Disadvantaged Communities and Resources Map



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.

N

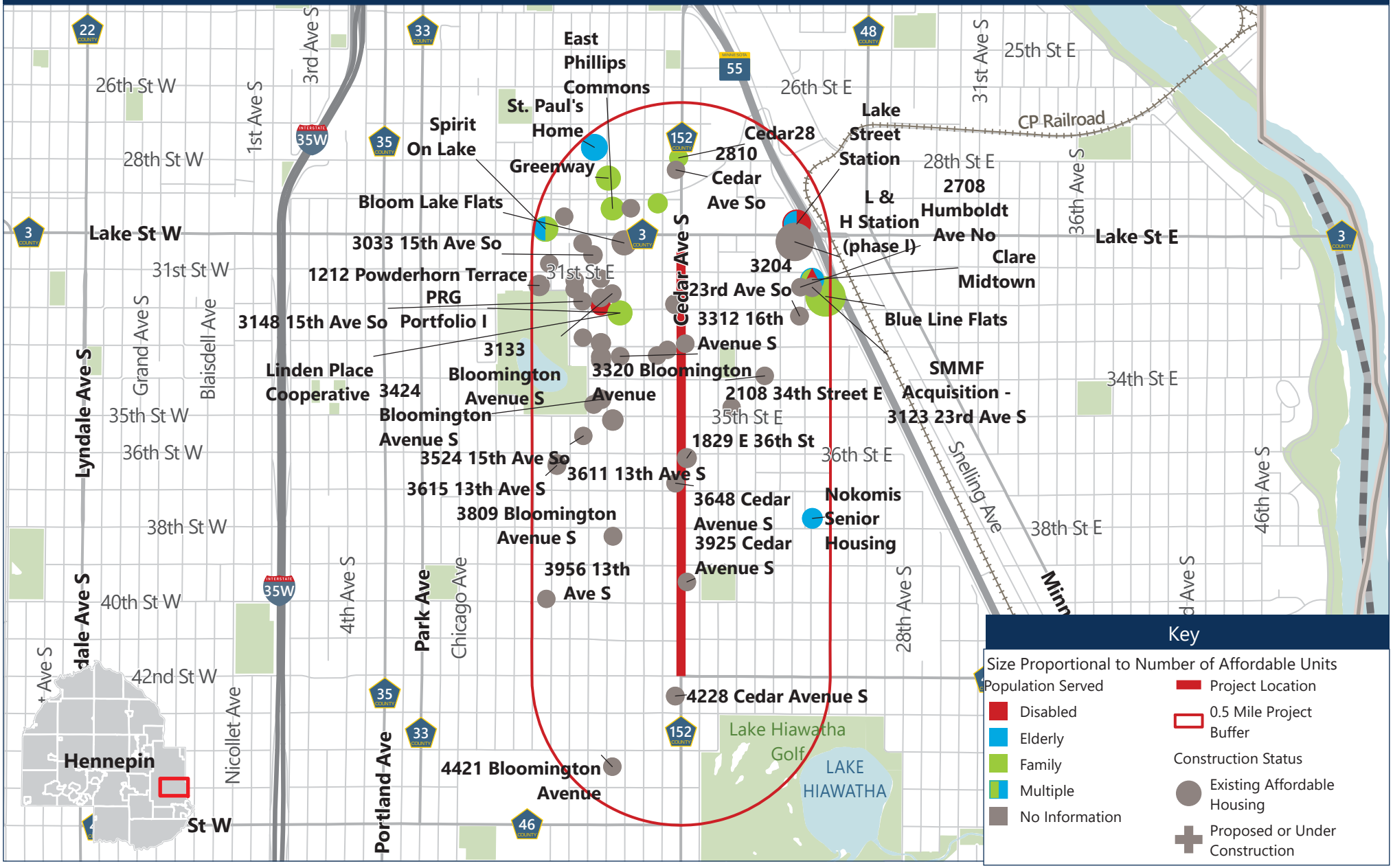
0 0.5 1 Miles

Publication date: 12/13/2023

Data sources (if applicable):

CSAH 152 (Cedar Ave) Reconstruction Phase 2 Project

Attachment 08 | Affordable Housing Access Map and Detail Summary



Key

Size Proportional to Number of Affordable Units

Population Served

- Disabled
- Elderly
- Family
- Multiple
- No Information

- Project Location
- 0.5 Mile Project Buffer

Construction Status

- Existing Affordable Housing
- Proposed or Under Construction

N

0 0.75 1.5 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.

Publication date: 11/6/2023

Data sources (if applicable):

CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 08 | Affordable Housing Access Map and Detail Summary

Property ID	Property Name	Total Units	Affordable Units	30% AMI	50% AMI	60% AMI	80% AMI	0 BR	1 BR	2 BR	3 BR	4 BR
3775	St. Paul's Home	53	53	53	0	0	0	17	36	0	0	0
4479	East Phillips Commons	34	34	0	0	34	0	0	6	19	9	0
4820	Linden Place Cooperative	8	8	0	0	8	0	0	0	4	4	0
8446	Cedar28	15	5	0	3	1	1	0	2	3	0	0
8576	Nokomis Senior Housing	77	16	0	16	0	0	0	16	0	0	0
9345	Ford House	11	11	0	11	0	0	0	11	0	0	0
9346	Anpa Waste Apts	10	10	0	10	0	0	0	0	0	0	0
10312	Spirit On Lake	46	46	5	41	0	0	0	29	17	0	0
10671	Lake Street Station	64	64	0	0	64	0	0	53	11	0	0
10970	Blue Line Flats (fka Corcoran Triangle)	135	135	9	37	89	0	0	60	53	22	0
11056	Clare Midtown	45	35	0	21	14	0	18	17	0	0	0
11215	Scattered Sites - Sumner Field Townhome	20	20	20	0	0	0	0	0	0	0	0
11227	Mhop - Urban Gardens	6	6	6	0	0	0	0	0	0	0	0
10598	Greenway	42	42	0	42	0	0	0	0	16	22	4
12351	PRG Portfolio I	42	42	15	14	13	0	0	0	20	22	0
12381	L & H Station (phase I)	123	123	0	0	0	123	36	69	18	0	0
13459	29XX 18th Avenue South	12	12	0	0	12	0	0	2	10	0	0
15702	SMMF Acquisition - 3123 23rd Ave S	12	9	0	0	2	7	0	0	0	0	0
15776	1212 Powderhorn Terrace	20	20	0	0	20	0	0	0	0	0	0
15699	Bloom Lake Flats	42	42	28	14	0	0	17	10	11	4	0
15853	1829 E 36th St	11	11	0	0	11	0	0	0	0	0	0
15862	1900 Colfax Ave So	7	2	0	0	2	0	0	0	0	0	0
15882	2108 34th Street E	2	2	0	0	2	0	0	0	0	0	0
15960	2708 Humboldt Ave No	2	2	0	0	2	0	0	0	0	0	0
15971	2810 Cedar Ave So	1	1	0	0	1	0	0	0	0	0	0
15984	2913 16th Avenue S	2	2	0	0	2	0	0	0	0	0	0
15993	3010 15th Ave So	2	2	0	0	2	0	0	0	0	0	0
16004	3033 15th Ave So	8	8	0	0	8	0	0	0	0	0	0
16007	3042 13th Ave S #4	1	1	0	0	1	0	0	0	0	0	0
16012	3113 14th Avenue S	2	2	0	0	2	0	0	0	0	0	0
16017	3127 14th Avenue S	3	2	0	0	2	0	0	0	0	0	0
16020	3133 Bloomington Avenue S	4	3	0	0	3	0	0	0	0	0	0
16021	3142 Bloomington Avenue	3	3	0	0	3	0	0	0	0	0	0
16022	3148 15th Ave So	2	2	0	0	2	0	0	0	0	0	0
16025	3204 23rd Ave So	4	4	0	0	4	0	0	0	0	0	0
16037	3245 Cedar Avenue S	2	2	0	0	2	0	0	0	0	0	0
16039	3248 15th Avenue S	3	1	0	0	1	0	0	0	0	0	0
16042	3254 Bloomington Ave So	12	12	0	0	12	0	0	0	0	0	0
16046	3308 18th Ave So	2	2	0	0	2	0	0	0	0	0	0
16045	3303 18th Avenue S	2	1	0	0	1	0	0	0	0	0	0

AMI: Area Median Income

CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 08 | Affordable Housing Access Map and Detail Summary

Property ID	Property Name	Total Units	Affordable Units	30% AMI	50% AMI	60% AMI	80% AMI	0 BR	1 BR	2 BR	3 BR	4 BR
16049	3312 Bloomington Avenue S	11	11	0	0	11	0	0	0	0	0	0
16048	3312 16th Avenue S	3	3	0	0	3	0	0	0	0	0	0
16051	3320 Bloomington Avenue	11	11	0	0	11	0	0	0	0	0	0
16060	3424 Bloomington Avenue S	8	8	0	0	8	0	0	0	0	0	0
16062	3433-35 15th Avenue	4	4	0	0	4	0	0	0	0	0	0
16065	3442 20th Avenue S	2	1	0	0	1	0	0	0	0	0	0
16070	3524 15th Ave So	3	1	0	0	1	0	0	0	0	0	0
16077	3611 13th Ave S	2	1	0	0	1	0	0	0	0	0	0
16079	3615 13th Ave S	4	4	0	0	4	0	0	0	0	0	0
16083	3648 Cedar Avenue S	4	2	0	0	2	0	0	0	0	0	0
16094	3809 Bloomington Avenue S	4	4	0	0	4	0	0	0	0	0	0
16104	3925 Cedar Avenue S	2	2	0	0	2	0	0	0	0	0	0
16111	3956 13th Ave S	2	1	0	0	1	0	0	0	0	0	0
16128	4228 Cedar Avenue S	4	4	0	0	4	0	0	0	0	0	0
16140	4421 Bloomington Avenue	2	2	0	0	2	0	0	0	0	0	0
16299	2920 14th Ave So	1	1	0	0	1	0	0	0	0	0	0

AMI: Area Median Income

CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 09 | Hennepin County StreetLight Analysis

Type of Travel	Zone Name	Truck - StL Truck Index	HCAADT to Index Ratio	**Estimated HCAADT**
Commercial	CSAH 005 & E of Louisiana Ave	2058	0.2910	**600**
Commercial	CSAH 023 & N of 28th Ave NE	11578	0.2910	**3350**
Commercial	CSAH 030 & W of Jefferson Hwy	1658	0.2910	**485**
Commercial	CSAH 152 & S of 36th St E	5993	0.2910	**1750**
Commercial	CSAH 153 & W of Stinson Pkwy	2512	0.2910	**730**

Example calculation: 2058*0.2910=600

Type of Travel	Zone Name	Truck - StL Truck Index	2021 HCAADT	HCAADT to Index Ratio
Commercial	H019	1383	270	0.1952
Commercial	H045	14065	2950	0.2097
Commercial	H052	6363	2750	0.4322
Commercial	H118	1182	330	0.2792
Commercial	H120	9342	750	0.0803
Commercial	H146	3240	770	0.2377
Commercial	H250	6116	500	0.0818
Commercial	H251	4374	2050	0.4687
Commercial	H302	28750	3250	0.1130
Commercial	H313	4876	1300	0.2666
Commercial	H315	3686	920	0.2496
Commercial	H404	1756	890	0.5068
Commercial	H443	5276	2850	0.5402
Commercial	H488	1173	225	0.1918
Commercial	H543	2906	960	0.3304
Commercial	H570	5202	2700	0.5190
Commercial	H571	11759	1450	0.1233
Commercial	H610	10808	4100	0.3793
Commercial	H637	6878	1600	0.2326
Commercial	H649	2398	600	0.2502
Commercial	H745	8290	3350	0.4041
Commercial	H766	3945	1800	0.4563
Commercial	H807	13019	1900	0.1459

Average ratio **0.2910**

CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 10 | Crash Map and Detail Listing

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Publication date: 11/21/2023

Data sources (if applicable):

CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 10 | Crash Map and Detail Listing

Segment A | From 50' North of CSAH 42 (42nd St) to 40th St

Incident ID	Roadway	Month	Day	Year	Basic Type	Severity	Number K's	Number of Veh	Latitude	Longitude
01025606	CEDAR AVE S	5-May	28	2022	Head On (Parked Vehicle)	Possible Injury	0	2	44.92707	-93.24734
00944460	CEDAR AVE S	10-Oct	3	2021	Head On (Parked Vehicle)	Property Damage Only	0	3	44.92717	-93.24734
00932828	CEDAR AVE S	8-Aug	5	2021	Rear End	Property Damage Only	0	2	44.92730	-93.24734
01047316	CEDAR AVE S	9-Sep	22	2022	Rear End (Parked Car)	Property Damage Only	0	2	44.92738	-93.24734
00916066	CEDAR AVE S	7-Jul	4	2021	Rear End (Parked Car)	Property Damage Only	0	2	44.92781	-93.24734
00979090	CEDAR AVE S	12-Dec	9	2021	Rear End	Property Damage Only	0	3	44.92782	-93.24734
00844282	CEDAR AVE S	10-Oct	3	2020	Rear End	Property Damage Only	0	4	44.92816	-93.24734
00906054	CEDAR AVE S	5-May	16	2021	Rear End	Property Damage Only	0	2	44.92845	-93.24734
00929623	CEDAR AVE S	7-Jul	22	2021	Rear End (Parked Car)	Property Damage Only	0	2	44.92871	-93.24736
00987684	CEDAR AVE S	1-Jan	10	2022	Single Vehicle Run Off Road	Property Damage Only	0	1	44.93036	-93.24735
00930805	CEDAR AVE S	7-Jul	27	2021	Rear End	Property Damage Only	0	2	44.93081	-93.24735
00904943	CEDAR AVE S	5-May	10	2021	Rear End	Property Damage Only	0	2	44.92693	-93.24734
	Subtotal:	**12**								

Intersection B | At 40th St

Incident ID	Roadway	Month	Day	Year	Basic Type	Severity	Number K's	Number of Veh	Latitude	Longitude
00931111	CEDAR AVE S	7-Jul	29	2021	Angle	Property Damage Only	0	2	44.93047	-93.24735
00797854	CEDAR AVE S	2-Feb	14	2020	Rear End	Property Damage Only	0	3	44.93087	-93.24735
01065282	E 40TH ST	12-Dec	14	2022	Single Vehicle Run Off Road	Property Damage Only	0	1	44.93047	-93.24737
	Subtotal:	**3**								

Segment C | From 40th St to 38th St

Incident ID	Roadway	Month	Day	Year	Basic Type	Severity	Number K's	Number of Veh	Latitude	Longitude
00785728	CEDAR AVE	2-Feb	5	2020	Rear End (Parked Car)	Serious Injury	0	2	44.93200	-93.24735
01027464	CEDAR AVE S	6-Jun	9	2022	Rear End (Parked Car)	Property Damage Only	0	2	44.93201	-93.24735
01016659	CEDAR AVE S	4-Apr	4	2022	Rear End (Parked Car)	Property Damage Only	0	2	44.93218	-93.24736
00837558	CEDAR AVE S	8-Aug	26	2020	Rear End (Parked Car)	Property Damage Only	0	2	44.93236	-93.24736
00782885	CEDAR AVE S	1-Jan	23	2020	Rear End (Parked Car)	Property Damage Only	0	2	44.93240	-93.24736
00809146	CEDAR AVE S	5-May	4	2020	Single Vehicle Run Off Road	Serious Injury	0	1	44.93244	-93.24736
00897375	CEDAR AVE S	3-Mar	24	2021	Head On (Parked Vehicle)	Property Damage Only	0	2	44.93258	-93.24736
00844764	CEDAR AVE S	10-Oct	6	2020	Rear End (Parked Car)	Property Damage Only	0	3	44.93304	-93.24736
01045211	CEDAR AVE S	9-Sep	12	2022	Rear End (Parked Car)	Property Damage Only	0	2	44.93345	-93.24736
00864585	CEDAR AVE S	11-Nov	21	2020	Single Vehicle Run Off Road	Property Damage Only	0	1	44.93354	-93.24736
01037579	CEDAR AVE S	7-Jul	31	2022	Rear End	Possible Injury	0	4	44.93412	-93.24736
00779241	E 39TH ST	1-Jan	13	2020	Rear End	Property Damage Only	0	2	44.93234	-93.24724
	Subtotal:	**12**								

Intersection D | At 38th St

Incident ID	Roadway	Month	Day	Year	Basic Type	Severity	Number K's	Number of Veh	Latitude	Longitude
No crashes reported within the Area of Influence for Intersection D										
	Subtotal:	**0**								

CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 10 | Crash Map and Detail Listing

Segment E | From 38th St to 36th St

Incident ID	Roadway	Month	Day	Year	Basic Type	Severity	Number K's	Number of Veh	Latitude	Longitude
01036725	CEDAR AVE S	7-Jul	29	2022	Single Vehicle Run Off Road	Possible Injury	0	2	44.93438	-93.24736
00817059	CEDAR AVE S	6-Jun	29	2020	Rear End	Property Damage Only	0	4	44.93566	-93.24736
00980012	CEDAR AVE S	12-Dec	12	2021	Angle	Possible Injury	0	2	44.93597	-93.24736
01050993	CEDAR AVE S	10-Oct	11	2022	Angle	Property Damage Only	0	3	44.93600	-93.24736
00820411	CEDAR AVE S	7-Jul	18	2020	Rear End (Parked Car)	Property Damage Only	0	4	44.93708	-93.24736
01014719	CEDAR AVE S	3-Mar	29	2022	Rear End (Parked Car)	Property Damage Only	0	2	44.93631	-93.24736
00985915	CEDAR AVE S	10-Oct	17	2021	Rear End (Parked Car)	Property Damage Only	0	5	44.93588	-93.24729
00904766	CEDAR AVE S	5-May	9	2021	Sideswipe Same Direction (Parked Car)	Property Damage Only	0	2	44.93518	-93.24732
00896456	CEDAR AVE S	3-Mar	17	2021	Sideswipe Same Direction (Parked Car)	Possible Injury	0	4	44.93457	-93.24736
00944827	E 36TH ST	9-Sep	7	2021	Sideswipe Same Direction (Parked Car)	Property Damage Only	0	3	44.93781	-93.24739
00900385	E 38TH ST	4-Apr	12	2021	Rear End (Parked Car)	Property Damage Only	0	2	44.93410	-93.24738
01015099	E 37TH ST	3-Mar	30	2022	Angle	Serious Injury	0	3	44.93594	-93.24734
00928687	E 37TH ST	7-Jul	17	2021	Rear End	Property Damage Only	0	2	44.93594	-93.24709
	Subtotal:	**13**								

Intersection F | At 36th St

Incident ID	Roadway	Month	Day	Year	Basic Type	Severity	Number K's	Number of Veh	Latitude	Longitude
00809325	CEDAR AVE S	5-May	6	2020	Angle	Property Damage Only	0	2	44.93777	-93.24736
01068548	CEDAR AVE S	12-Dec	22	2022	Rear End	Property Damage Only	0	2	44.93785	-93.24736
	Subtotal:	**2**								

Segment G | From 36th St to 35th St

Incident ID	Roadway	Month	Day	Year	Basic Type	Severity	Number K's	Number of Veh	Latitude	Longitude
01062512	CEDAR AVE S	11-Nov	20	2022	Rear End	Property Damage Only	0	2	44.93817	-93.24736
01062523	CEDAR AVE S	12-Dec	1	2022	Head On (Parked Vehicle)	Property Damage Only	0	2	44.93826	-93.24736
00904453	CEDAR AVE S	5-May	8	2021	Head On	Property Damage Only	0	3	44.93895	-93.24736
00904493	CEDAR AVE S	5-May	8	2021	Sideswipe Same Direction (Parked Car)	Property Damage Only	0	2	44.93915	-93.24735
00944063	CEDAR AVE S	10-Oct	1	2021	Left Turn	Property Damage Only	0	2	44.93848	-93.24737
00802446	CEDAR AVE S	3-Mar	5	2020	Angle	Property Damage Only	0	2	44.93830	-93.24736
00928757	E 35TH ST	7-Jul	17	2021	Sideswipe Same Direction (Parked Car)	Property Damage Only	0	2	44.93962	-93.24752
	Subtotal:	**7**								

Intersection H | At 35th St

Incident ID	Roadway	Month	Day	Year	Basic Type	Severity	Number K's	Number of Veh	Latitude	Longitude
00823162	CEDAR AVE S	8-Aug	2	2020	Bike	Possible Injury	0	1	44.93962	-93.24735
01048212	CEDAR AVE S	9-Sep	27	2022	Angle	Property Damage Only	0	2	44.93962	-93.24735
00907305	CEDAR AVE S	5-May	23	2021	Rear End	Possible Injury	0	2	44.93967	-93.24735
00976663	E 35TH ST	12-Dec	1	2021	Angle	Property Damage Only	0	3	44.93962	-93.24743
01042614	E 35TH ST	8-Aug	30	2022	Angle	Property Damage Only	0	2	44.93962	-93.24735
01044493	E 35TH ST	9-Sep	8	2022	Left Turn	Property Damage Only	0	2	44.93962	-93.24731
00800724	E 35TH ST	2-Feb	25	2020	Sideswipe Same Direction	Property Damage Only	0	2	44.93962	-93.24730
00821790	E 35TH ST	7-Jul	26	2020	Pedestrian	Minor Injury	0	1	44.93962	-93.24738
	Subtotal:	**8**								

CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 10 | Crash Map and Detail Listing

Segment I | From 35th St to 34th St

Incident ID	Roadway	Month	Day	Year	Basic Type	Severity	Number K's	Number of Veh	Latitude	Longitude
00806561	CEDAR AVE S	4-Apr	10	2020	Rear End (Parked Car)	Property Damage Only	0	3	44.94022	-93.24735
00933486	CEDAR AVE S	8-Aug	11	2021	Rear End (Parked Car)	Property Damage Only	0	3	44.94032	-93.24735
00821743	CEDAR AVE S	7-Jul	26	2020	Rear End (Parked Car)	Property Damage Only	0	2	44.94049	-93.24735
00944057	CEDAR AVE S	10-Oct	1	2021	Rear End (Parked Car)	Property Damage Only	0	3	44.94061	-93.24735
00844204	CEDAR AVE S	10-Oct	3	2020	Rear End (Parked Car)	Property Damage Only	0	2	44.94077	-93.24735
00797850	CEDAR AVE S	2-Feb	14	2020	Sideswipe Same Direction	Property Damage Only	0	2	44.94107	-93.24735
00811534	CEDAR AVE S	5-May	24	2020	Rear End (Parked Car)	Property Damage Only	0	2	44.94057	-93.24735
00895388	CEDAR AVE S	3-Mar	12	2021	Head On (Parked Vehicle)	Property Damage Only	0	3	44.94043	-93.24735
00800273	CEDAR AVE S	2-Feb	23	2020	Rear End (Parked Car)	Possible Injury	0	2	44.93960	-93.24735
00821999	E 32ND ST	7-Jul	27	2020	Rear End	Possible Injury	0	2	44.94476151	-93.24735321
	Subtotal:	**10**								

Intersection J | At 34th St

Incident ID	Roadway	Month	Day	Year	Basic Type	Severity	Number K's	Number of Veh	Latitude	Longitude
00782254	CEDAR AVE S	1-Jan	22	2020	Sideswipe Same Direction	Property Damage Only	0	2	44.94139	-93.24735
00834415	CEDAR AVE S	8-Aug	9	2020	Rear End	Minor Injury	0	2	44.94154	-93.24735
00936932	E 34TH ST	8-Aug	27	2021	Rear End	Minor Injury	0	2	44.94139	-93.24743
01004495	E 34TH ST	2-Feb	6	2022	Rear End	Minor Injury	0	2	44.94139	-93.24735
	Subtotal:	**4**								

Segment K | From 34th St to 32nd St

Incident ID	Roadway	Month	Day	Year	Basic Type	Severity	Number K's	Number of Veh	Latitude	Longitude
00967647	CEDAR AVE S	10-Oct	18	2021	Rear End	Possible Injury	0	2	44.94268	-93.24735
01035686	CEDAR AVE S	7-Jul	23	2022	Angle	Possible Injury	0	2	44.94296	-93.24735
00840648	CEDAR AVE S	9-Sep	14	2020	Sideswipe Same Direction	Property Damage Only	0	4	44.94298	-93.24735
01032112	CEDAR AVE S	7-Jul	4	2022	Bike	Serious Injury	0	1	44.94300	-93.24735
00861049	CEDAR AVE S	11-Nov	3	2020	Rear End	Property Damage Only	0	3	44.94303	-93.24735
00969450	CEDAR AVE S	10-Oct	27	2021	Single Vehicle Run Off Road	Property Damage Only	0	1	44.94357	-93.24735
00939128	CEDAR AVE S	9-Sep	7	2021	Rear End	Property Damage Only	0	3	44.94362	-93.24735
00862057	CEDAR AVE S	11-Nov	9	2020	Rear End (Parked Car)	Property Damage Only	0	2	44.94401	-93.24735
00809204	CEDAR AVE S	5-May	5	2020	Sideswipe Same Direction (Parked Car)	Property Damage Only	0	2	44.94431	-93.24735
00968544	CEDAR AVE S	10-Oct	22	2021	Rear End	Property Damage Only	0	3	44.94658	-93.24725
00933221	E 33RD ST	8-Aug	9	2021	Rear End	Property Damage Only	0	3	44.94296	-93.24735
01039729	E 33RD ST	8-Aug	14	2022	Angle	Property Damage Only	0	2	44.94296	-93.24731
01034467	E 33RD ST	7-Jul	17	2022	Rear End	Possible Injury	0	4	44.94296	-93.24726
	Subtotal:	**13**								

Intersection L | At 32nd St

Incident ID	Roadway	Month	Day	Year	Basic Type	Severity	Number K's	Number of Veh	Latitude	Longitude
00908711	CEDAR AVE S	5-May	29	2021	Angle	Minor Injury	0	2	44.94473	-93.24735
00968050	CEDAR AVE S	10-Oct	20	2021	Pedestrian	Possible Injury	0	1	44.94478	-93.24735
	Subtotal:	**2**								

CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 10 | Crash Map and Detail Listing

Segment M | From 32nd St to 31st St

Incident ID	Roadway	Month	Day	Year	Basic Type	Severity	Number K's	Number of Veh	Latitude	Longitude
01042972	CEDAR AVE S	8-Aug	31	2022	Rear End	Property Damage Only	0	3	44.94449	-93.24735
01017037	CEDAR AVE S	4-Apr	11	2022	Rear End	Property Damage Only	0	3	44.94482	-93.24735
01041219	CEDAR AVE S	8-Aug	23	2022	Rear End	Property Damage Only	0	2	44.94481	-93.24735
00839238	CEDAR AVE S	9-Sep	6	2020	Sideswipe Same Direction (Parked Car)	Property Damage Only	0	2	44.94522	-93.24735
001002826	CEDAR AVE S	1-Jan	29	2022	Rear End (Parked Car)	Property Damage Only	0	2	44.94559	-93.24735
00899553	CEDAR AVE S	4-Apr	7	2021	Single Vehicle Run Off Road	Property Damage Only	0	1	44.94560	-93.24735
00818831	CEDAR AVE S	7-Jul	10	2020	Sideswipe Same Direction (Parked Car)	Property Damage Only	0	2	44.94573	-93.24735
00903424	CEDAR AVE S	5-May	2	2021	Rear End (Parked Car)	Possible Injury	0	3	44.94582	-93.24735
00805720	CEDAR AVE S	3-Mar	31	2020	Rear End (Parked Car)	Property Damage Only	0	2	44.94588	-93.24735
01034569	CEDAR AVE S	7-Jul	18	2022	Rear End (Parked Car)	Property Damage Only	0	2	44.94618	-93.24735
00804013	CEDAR AVE S	3-Mar	14	2020	Rear End (Parked Car)	Property Damage Only	0	4	44.94617	-93.24735
01007735	CEDAR AVE S	2-Feb	21	2022	Rear End (Parked Car)	Property Damage Only	0	2	44.94568	-93.24735
00904602	CEDAR AVE S	5-May	8	2021	Rear End (Parked Car)	Property Damage Only	0	3	44.94595	-93.24735
00932850	E 32ND ST	8-Aug	7	2021	Rear End	Minor Injury	0	2	44.94476	-93.24737
	Subtotal:	**14**								

Intersection N | At 31st St

Incident ID	Roadway	Month	Day	Year	Basic Type	Severity	Number K's	Number of Veh	Latitude	Longitude
00929343	CEDAR AVE S	7-Jul	19	2021	Angle	Property Damage Only	0	2	44.94657	-93.24734
01023901	CEDAR AVE S	5-May	20	2022	Head On	Property Damage Only	0	2	44.94658	-93.24734
00945577	CEDAR AVE S	10-Oct	8	2021	Rear End	Property Damage Only	0	2	44.94574	-93.24733
01055719	E 31ST ST	11-Nov	4	2022	Angle	Minor Injury	0	2	44.94658	-93.24738
01030567	E 31ST ST	6-Jun	25	2022	Angle	Property Damage Only	0	2	44.94658	-93.24734
00822226	E 31ST ST	7-Jul	28	2020	Left Turn	Possible Injury	0	2	44.94658	-93.24731
00809336	E 31ST ST	5-May	6	2020	Rear End	Possible Injury	0	2	44.94658	-93.24719
00908693	E 31ST ST	5-May	29	2021	Angle	Possible Injury	0	2	44.94658	-93.24719
	Subtotal:	**8**								

Segment O | From 31st St to 50' South of CSAH 3 (Lake St)

Incident ID	Roadway	Month	Day	Year	Basic Type	Severity	Number K's	Number of Veh	Latitude	Longitude
00998403	CEDAR AVE S	1-Jan	3	2022	Sideswipe Same Direction (Parked Car)	Possible Injury	0	3	44.94747	-93.24734
	Subtotal:	**1**								
	Grand Total:	**109**								

CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 10 | Crash Map and Detail Listing

Reported Crashes Located Outside of the Project Area

Incident ID	Roadway	Month	Day	Year	Basic Type	Severity	Number K's	Number of Veh	Latitude	Longitude
00895663	E 42ND ST	3-Mar	14	2021	Rear End	Property Damage Only	0	2	44.92687	-93.24729
00910738	E 42ND ST	6-Jun	8	2021	Rear End	Property Damage Only	0	2	44.92687	-93.24719
00802735	E 46TH ST	3-Mar	6	2020	Angle	Property Damage Only	0	2	44.91972	-93.24745
01040505	E 46TH ST	8-Aug	18	2022	Single Vehicle Run Off Road	Property Damage Only	0	1	44.91972	-93.24738
01049658	E 46TH ST	10-Oct	4	2022	Rear End	Property Damage Only	0	2	44.91972	-93.24739
01034088	E 46TH ST	7-Jul	15	2022	Left Turn	Minor Injury	0	2	44.91972	-93.24735
01022414	CEDAR AVE S	5-May	12	2022	Rear End	Property Damage Only	0	2	44.91610	-93.24735
00835263	CEDAR AVE S	8-Aug	14	2020	Sideswipe Same Direction	Property Damage Only	0	3	44.91636	-93.24735
00777874	CEDAR AVE S	1-Jan	6	2020	Other	Property Damage Only	0	2	44.91648	-93.24735
00890291	CEDAR AVE S	2-Feb	13	2021	Left Turn	Possible Injury	0	2	44.91664	-93.24735
01028668	CEDAR AVE S	6-Jun	15	2022	Angle	Possible Injury	0	2	44.91730	-93.24734
00944316	CEDAR AVE S	10-Oct	2	2021	Angle	Minor Injury	0	2	44.91737	-93.24734
00836144	CEDAR AVE S	8-Aug	13	2020	Rear End	Minor Injury	0	3	44.91827	-93.24733
00901098	CEDAR AVE S	4-Apr	16	2021	Other	Property Damage Only	0	2	44.91869	-93.24733
00813077	CEDAR AVE S	6-Jun	1	2020	Rear End	Possible Injury	0	3	44.91890	-93.24733
00938312	CEDAR AVE S	9-Sep	3	2021	Rear End	Minor Injury	0	2	44.91892	-93.24733
00937558	CEDAR AVE S	8-Aug	31	2021	Other	Minor Injury	0	2	44.91906	-93.24732
01003734	CEDAR AVE S	2-Feb	2	2022	Rear End	Property Damage Only	0	2	44.91938	-93.24732
01020853	CEDAR AVE S	5-May	3	2022	Rear End	Property Damage Only	0	2	44.91942	-93.24731
01017950	CEDAR AVE S	4-Apr	16	2022	Rear End	Property Damage Only	0	2	44.91957	-93.24732
00838064	CEDAR AVE S	8-Aug	30	2020	Single Vehicle Run Off Road	Property Damage Only	0	1	44.91972	-93.24732
00837149	CEDAR AVE S	8-Aug	25	2020	Head On	Property Damage Only	0	2	44.91987	-93.24732
01019333	CEDAR AVE S	4-Apr	25	2022	Rear End	Minor Injury	0	2	44.92140	-93.24732
00890767	CEDAR AVE S	2-Feb	15	2021	Head On	Minor Injury	0	2	44.92230	-93.24733
00804503	CEDAR AVE S	3-Mar	18	2020	Other	Property Damage Only	0	2	44.92326	-93.24733
01021220	CEDAR AVE S	5-May	6	2022	Other	Property Damage Only	0	2	44.92363	-93.24733
00823031	CEDAR AVE S	8-Aug	1	2020	Other	Property Damage Only	0	3	44.92365	-93.24733
00840153	CEDAR AVE S	9-Sep	10	2020	Other	Property Damage Only	0	3	44.92388	-93.24733
00937618	CEDAR AVE S	8-Aug	31	2021	Other	Possible Injury	0	3	44.92512	-93.24733
00848723	CEDAR AVE S	10-Oct	23	2020	Rear End	Possible Injury	0	3	44.92592	-93.24734
01068329	CEDAR AVE S	12-Dec	21	2022	Single Vehicle Run Off Road	Property Damage Only	0	1	44.92608	-93.24734
00937616	CEDAR AVE S	8-Aug	31	2021	Rear End	Property Damage Only	0	4	44.92667	-93.24734
00985995	CEDAR AVE S	1-Jan	4	2022	Angle	Property Damage Only	0	2	44.92686	-93.24734
00982330	CEDAR AVE S	12-Dec	21	2021	Angle	Property Damage Only	0	2	44.92687	-93.24734
01001253	CEDAR AVE S	1-Jan	23	2022	Head On	Possible Injury	0	2	44.92687	-93.24734
01061832	CEDAR AVE S	11-Nov	29	2022	Rear End	Property Damage Only	0	2	44.92701	-93.24734
00805282	CEDAR AVE S	3-Mar	26	2020	Other	Property Damage Only	0	2	44.93779	-93.24736
00806901	CEDAR AVE S	4-Apr	13	2020	Pedestrian	Minor Injury	0	1	44.93784	-93.24736
00838187	CEDAR AVE S	8-Aug	5	2020	Rear End	Property Damage Only	0	2	44.94130	-93.24735
01001619	CEDAR AVE S	1-Jan	24	2022	Single Vehicle Run Off Road	Property Damage Only	0	1	44.94663	-93.24731
00908607	CEDAR AVE S	5-May	29	2021	Rear End	Minor Injury	0	2	44.94460	-93.24735
01009004	CEDAR AVE S	2-Feb	24	2022	Rear End	Possible Injury	0	2	44.92683	-93.24734
00809047	CEDAR AVE S	5-May	3	2020	Angle	Possible Injury	0	2	44.92333	-93.24733
00785743	CEDAR AVE S	2-Feb	5	2020	Other	Minor Injury	0	3	44.92327	-93.24733
00838626	CEDAR AVE S	9-Sep	2	2020	Rear End	Property Damage Only	0	2	44.91991	-93.24737
00956243	CEDAR AVE S	10-Oct	11	2021	Other	Property Damage Only	0	2	44.91913	-93.24732
00783626	CEDAR AVE S	1-Jan	26	2020	Pedestrian	Serious Injury	0	2	44.91757	-93.24734
00778213	CEDAR AVE S	1-Jan	9	2020	Rear End	Property Damage Only	0	2	44.91618	-93.24735
00898301	CEDAR AVE S	3-Mar	30	2021	Angle	Property Damage Only	0	2	44.91609	-93.24735
00801455	E 35TH ST	2-Feb	29	2020	Pedestrian	Property Damage Only	0	1	44.93962	-93.24726
00941460	E 36TH ST	9-Sep	19	2021	Head On	Property Damage Only	0	2	44.93781	-93.24692
00974539	E 42ND ST	11-Nov	18	2021	Angle	Property Damage Only	0	2	44.92687	-93.24738
00889360	E 33RD ST	2-Feb	9	2021	Single Vehicle Run Off Road	Property Damage Only	0	1	44.94296	-93.24739
00892926	E 34TH ST	2-Feb	25	2021	Angle	Property Damage Only	0	2	44.94138	-93.24706
00841495	E 45TH ST	9-Sep	18	2020	Other	Property Damage Only	0	2	44.92149	-93.24750
00867483	E 45TH ST	12-Dec	11	2020	Single Vehicle Run Off Road	Fatal	1	1	44.92149	-93.24738
00916763	E 47TH ST	7-Jul	7	2021	Rear End	Property Damage Only	0	2	44.91785	-93.24732
00934380	E MINNEHAHA PKWY	8-Aug	15	2021	Rear End	Property Damage Only	0	2	44.91612	-93.24765
00900931	E MINNEHAHA PKWY	4-Apr	15	2021	Angle	Possible Injury	0	2	44.91612	-93.24739
00969968	E MINNEHAHA PKWY	10-Oct	29	2021	Bike	Property Damage Only	0	1	44.91612	-93.24733
01017253	CEDAR AVE / E MINNEHAHA PKWY	4-Apr	12	2022	Angle	Possible Injury	0	4	44.91612	-93.24731
00815709	E MINNEHAHA PKWY	6-Jun	21	2020	Angle	Property Damage Only	0	2	44.91612	-93.24727
	Subtotal:	**62**								

CRASH MODIFICATION FACTORS CLEARINGHOUSE

CMF / CRF DETAILS

CMF ID: 9300

RESURFACE PAVEMENT

DESCRIPTION:

PRIOR CONDITION: *NO PRIOR CONDITION(S)*

CATEGORY: ROADWAY

STUDY: *TIME SERIES TRENDS OF THE SAFETY EFFECTS OF PAVEMENT RESURFACING*, PARK ET AL., 2017

Star Quality Rating:	★★★☆☆ [VIEW SCORE DETAILS]
Rating Points Total:	105

Crash Modification Factor (CMF)

Value:	0.853
Adjusted Standard Error:	
Unadjusted Standard Error:	0.074

Crash Reduction Factor (CRF)

Value:	14.7 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	7.4

Applicability

Crash Type:	All
Crash Severity:	All
Roadway Types:	Principal Arterial Other
Street Type:	
Minimum Number of Lanes:	1
Maximum Number of Lanes:	4
Number of Lanes Direction:	
Number of Lanes Comment:	

Crash Weather:	Not specified
Road Division Type:	
Minimum Speed Limit:	25
Maximum Speed Limit:	65
Speed Unit:	mph
Speed Limit Comment:	
Area Type:	Urban
Traffic Volume:	Minimum of 2100 to Maximum of 40500 Annual Average Daily Traffic (AADT)
Average Traffic Volume:	8659 Annual Average Daily Traffic (AADT)
Time of Day:	Not specified

If countermeasure is intersection-based

Intersection Type:	
Intersection Geometry:	
Traffic Control:	
Major Road Traffic Volume:	
Minor Road Traffic Volume:	
Average Major Road Volume :	
Average Minor Road Volume :	

Development Details

Date Range of Data Used:	2004 to 2013
Municipality:	
State:	FL
Country:	USA
Type of Methodology Used:	Before/after using comparison group
Sample Size (crashes):	1157 crashes before
Sample Size (sites):	195 sites before, 195 sites after
Sample Size (miles):	115.44 miles before, 115.44 miles after

Other Details

Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	Jun 17, 2018
Comments:	Second year after treatment implementation

VIEW THE FULL STUDY DETA

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CRASH MODIFICATION FACTORS CLEARINGHOUSE

CMF / CRF DETAILS

CMF ID: 332

REMOVE UNWARRANTED SIGNAL (ONE-LANE, ONE-WAY STREETS, EXCLUDING MAJOR ARTERIALS)

DESCRIPTION:

PRIOR CONDITION: *NO PRIOR CONDITION(S)*

CATEGORY: INTERSECTION TRAFFIC CONTROL

STUDY: *CRASH REDUCTIONS RELATED TO TRAFFIC SIGNAL REMOVAL IN PHILADELPHIA*, PERSAUD ET AL., 1997

Star Quality Rating:	[VIEW SCORE DETAILS]
Rating Points Total:	117

Crash Modification Factor (CMF)

Value:	0.76
Adjusted Standard Error:	0.09
Unadjusted Standard Error:	0.07

Crash Reduction Factor (CRF)

Value:	24 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	9
Unadjusted Standard Error:	7

Applicability

Crash Type:	All
Crash Severity:	All
Roadway Types:	Not specified
Street Type:	
Minimum Number of Lanes:	
Maximum Number of Lanes:	
Number of Lanes Direction:	
Number of Lanes Comment:	

Crash Weather:	Not specified
Road Division Type:	
Minimum Speed Limit:	
Maximum Speed Limit:	
Speed Unit:	
Speed Limit Comment:	
Area Type:	Not specified
Traffic Volume:	
Average Traffic Volume:	
Time of Day:	

If countermeasure is intersection-based

Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	Not specified
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:	
Country:	
Type of Methodology Used:	Simple before/after

Other Details

Included in Highway Safety Manual?	Yes. HSM lists this CMF in **bold** font to indicate that it has the highest reliability since it has an adjusted standard erro less.
Date Added to Clearinghouse:	Dec 01, 2009
Comments:	Countermeasure name has been slightly modified for consistency across Clearinghouse

VIEW THE FULL STUDY DETA

EXPORT DETAIL PAGE AS PDF

CRASH MODIFICATION FACTORS CLEARINGHOUSE

CMF / CRF DETAILS

CMF ID: 4140

CHANGE PERMISSIVE LEFT-TURN PHASING TO PROTECTED ONLY OR PROTECTED/PERMISSIVE

DESCRIPTION: TREATMENT GROUP INCLUDES INTERSECTIONS WHERE SIGNAL PHASES WERE CHANGED FROM PERMISSIVE TO PROTECTED-ONLY OR PROTECTED/PERMISSIVE.

PRIOR CONDITION: TREATMENT GROUP INCLUDES INTERSECTIONS WHERE SIGNAL PHASES WERE CHANGED FROM PERMISSIVE TO PROTECTED-ONLY OR PROTECTED/PERMISSIVE.

CATEGORY: INTERSECTION TRAFFIC CONTROL

STUDY: *LEFT-TURN PHASE: PERMISSIVE, PROTECTED, OR BOTH?*, LI CHEN, CYNTHIA CHEN, AND REID EWING, 2012

Star Quality Rating:	★★☆☆☆ [VIEW SCORE DETAILS]
Rating Points Total:	65

Crash Modification Factor (CMF)

Value:	0.58
Adjusted Standard Error:	
Unadjusted Standard Error:	

Crash Reduction Factor (CRF)

Value:	42 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	

Applicability

Crash Type:	All
Crash Severity:	All
Roadway Types:	Not Specified
Street Type:	
Minimum Number of Lanes:	1
Maximum Number of Lanes:	5
Number of Lanes Direction:	
Number of Lanes Comment:	

Crash Weather:	Not specified
Road Division Type:	
Minimum Speed Limit:	
Maximum Speed Limit:	
Speed Unit:	
Speed Limit Comment:	
Area Type:	Urban
Traffic Volume:	
Average Traffic Volume:	
Time of Day:	All

If countermeasure is intersection-based

Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	3-leg,4-leg,More than 4 legs
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:	1995 to 2009
Municipality:	New York City
State:	NY
Country:	USA
Type of Methodology Used:	Simple before/after
Sample Size (crashes):	2447 crashes before, 564 crashes after

Other Details

Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	Nov 01, 2012
Comments:	The corresponding change in crashes in the comparison group was a 35 percent reduction in total crashes. This could adjust the treatment effect to account for other factors not related to the treatment.

VIEW THE FULL STUDY DETA

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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]
Rating Points Total:	30

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
Street Type:	
Minimum Number of Lanes:	
Maximum Number of Lanes:	
Number of Lanes Direction:	
Number of Lanes Comment:	

Crash Weather:	Not specified
Road Division Type:	
Minimum Speed Limit:	
Maximum Speed Limit:	
Speed Unit:	
Speed Limit Comment:	
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 PDF

CRASH MODIFICATION FACTORS CLEARINGHOUSE

CMF / CRF DETAILS

CMF ID: 7998

INSTALL LEFT-TURN LANE AT SIGNALIZED INTERSECTION

DESCRIPTION:

PRIOR CONDITION: INTERSECTIONS WITHOUT LEFT TURN LANES

CATEGORY: INTERSECTION GEOMETRY

STUDY: *SAFETY EVALUATION OF SIGNAL INSTALLATION WITH AND WITHOUT LEFT TURN LANES ON TWO LANE ROADS IN RURAL AND SUBURBAN AREAS*, SRINIVASAN ET AL., 2

Star Quality Rating:	[VIEW SCORE DETAILS]
Rating Points Total:	105

Crash Modification Factor (CMF)

Value:	0.876
Adjusted Standard Error:	
Unadjusted Standard Error:	0.066

Crash Reduction Factor (CRF)

Value:	12.4 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	6.6

Applicability

Crash Type:	All
Crash Severity:	All
Roadway Types:	Not specified
Street Type:	
Minimum Number of Lanes:	2
Maximum Number of Lanes:	2
Number of Lanes Direction:	
Number of Lanes Comment:	

Crash Weather:	Not specified
Road Division Type:	
Minimum Speed Limit:	
Maximum Speed Limit:	
Speed Unit:	
Speed Limit Comment:	
Area Type:	All
Traffic Volume:	
Average Traffic Volume:	
Time of Day:	All

If countermeasure is intersection-based

Intersection Type:	Not specified
Intersection Geometry:	3-leg,4-leg
Traffic Control:	Signalized
Major Road Traffic Volume:	Minimum of 1360 to Maximum of 18248 Annual Average Daily Traffic (AADT)
Minor Road Traffic Volume:	Minimum of 746 to Maximum of 13880 Annual Average Daily Traffic (AADT)
Average Major Road Volume :	8323 Annual Average Daily Traffic (AADT)
Average Minor Road Volume :	4188 Annual Average Daily Traffic (AADT)

Development Details

Date Range of Data Used:	1992 to 2012
Municipality:	
State:	NC
Country:	
Type of Methodology Used:	Before/after using empirical Bayes or full Bayes
Sample Size (crashes):	2368 crashes before, 1415 crashes after
Sample Size (sites):	117 sites before, 117 sites after
Sample Size (site-years):	576 site-years before, 559 site-years after

Other Details

Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	Nov 10, 2016
Comments:	The CMF was developed for both rural and suburban areas. The number of crashes in the after period were not repor study, however, they have been recorded as 300 to give 10 points as a beneift of doubt for one or more of the followi number of miles/sites in the reference/treatment group, (2) number of crashes in the references/treatment group, (3 AADTs for the aggregate dataset but not for the disaggragate dataset used for CMF development.

Enhanced Crosswalks

What are enhanced crosswalks?

Enhanced crosswalks are pedestrian crossing countermeasures used in addition to the pavement markings typically used at pedestrian crossings not controlled by a traffic signal or STOP sign. The most common examples of enhanced crosswalks include:

- Median refuge islands
- Curb extensions
- Street lights
- Rectangular Rapid Flashing Beacons (RRFBs)
- High-Intensity Activated CrossWalK beacon (HAWK beacon)

Curb Extensions

High-Intensity Activated Crosswalk Beacon

Rectangular Rapid Flashing Beacon

Why are enhanced crosswalks needed?

Research consistently conveys that marked crosswalks alone do NOT reduce the number or rate of pedestrian-vehicle crashes.[5] Since only marking a crosswalk is unlikely to improve pedestrian safety, the use of enhanced crossing countermeasures is suggested to improve crosswalk safety.

Although definitive rationale is not available as to why marked crosswalks alone are ineffective, theories include:

- False sense of security on the part of the pedestrians and inconsistent driving behaviors
- Distracted drivers and pedestrians
- Reduced effectiveness as a result of either overuse or warning of conditions that drivers rarely encounter

How effective are enhanced crosswalks?

Curb Extensions and Median Refuge Islands are countermeasures that reduce crossing distances. In the case of median refuge islands, allow for pedestrians to cross one direction of travel at a time. These improvements are PROVEN effective with crash reductions in the range of 40 to 45 percent.[2]

Street Lighting at isolated locations in rural areas is considered PROVEN effective, with a crash reduction in the range of 30 to 40 percent. Limited research is available on the effectiveness of pedestrian-related crashes in urban areas.

HAWK Beacons and RRBFs are relatively new technologies with promising initial research. HAWK beacons and RRFBs have crash reductions over 50 percent[4], and RRFBs have documented high yielding rates to pedestrians in excess of 80 percent.[4]

What are candidate locations for enhanced crosswalks?

The primary guidelines for installing crosswalk markings are documented in the Minnesota Manual on Uniform Traffic Control Devices (MN MUTCD).[1] To identify locations for enhanced crosswalks, the MN MUTCD guidance recommends that agencies prioritize their systems based on need and existing factors such as:

- Number of lanes
- Presence of median
- Distance from adjacent signals
- Pedestrian volume and delay
- Average daily traffic
- Speed limit
- Geometry
- Potential consolidation of nearby crossings

Although no research identifies minimum levels of pedestrian volumes that would indicate a threshold level of need, maximum vehicle volumes and speed limits are documented at approximately 12,000 vehicles per day and 40 miles per hour along multilane roadways. Therefore, it is recommended that candidate locations for enhanced crosswalks are two- or three-lane roads with speeds of 35 miles per hour or less and traffic volumes under 12,000 vehicles per day. Refer to guidelines for establshing crosswalks and consideration of a variety of enhancements.[6]

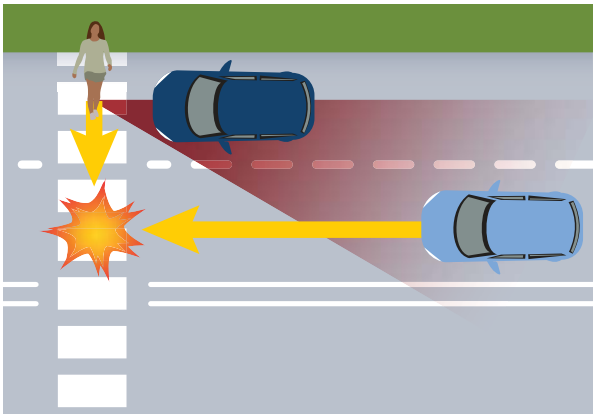
> *"Crosswalk lines should not be used indiscriminately. An engineering study should be performed before they are installed at a location away from a traffic control signal or an approach controlled by a STOP or YIELD sign." Section 3B.18, MN MUTCD*

Cost

Per Crossing

- Curb Extensions, Median Island, RRFB: $10,000-$25,000
- HAWK Beacon: $75,000-$150,000

Deployment should be prioritized by risk



What are the additional considerations?

A specific type of conflict at marked and unmarked crosswalks is the multi-vehicle threat. This conflict occurs on multi-lane roads when a vehicle in one lane stops for a pedestrian and a trailing vehicle (in the same direction) in an adjacent lane potentially hits the pedestrian when they emerge from in front of the stopped vehicle. This type of crash occurs as a result of both the pedestrian and driver failing to see one another.

Potential strategies to address the multi-vehicle threat include:

- The addition of an RRFB or HAWK to provide approaching drivers with a warning of the presence of a pedestrian attempting to cross the road.
- Four-to-three-lane road conversions (road diet) since the multi-vehicle threat occurs on roads with more than three lanes. END

References

1. Minnesota Department of Transportation (MnDOT). 2015. *Minnesota Manual on Uniform Traffic Control Devices.* http://www.dot.state.mn.us/trafficeng/publ/mutcd/. Accessed June 2017.
2. Preston, H., Nikki Farrington, and Charles Zegeer. 2013. *Minnesota's Best Practices for Pedestrian/Bicycle Safety.* MnDOT Report 2013-22. http://www.dot.state.mn.us/research/TS/2013/201322.pdf. Accessed June 2017.
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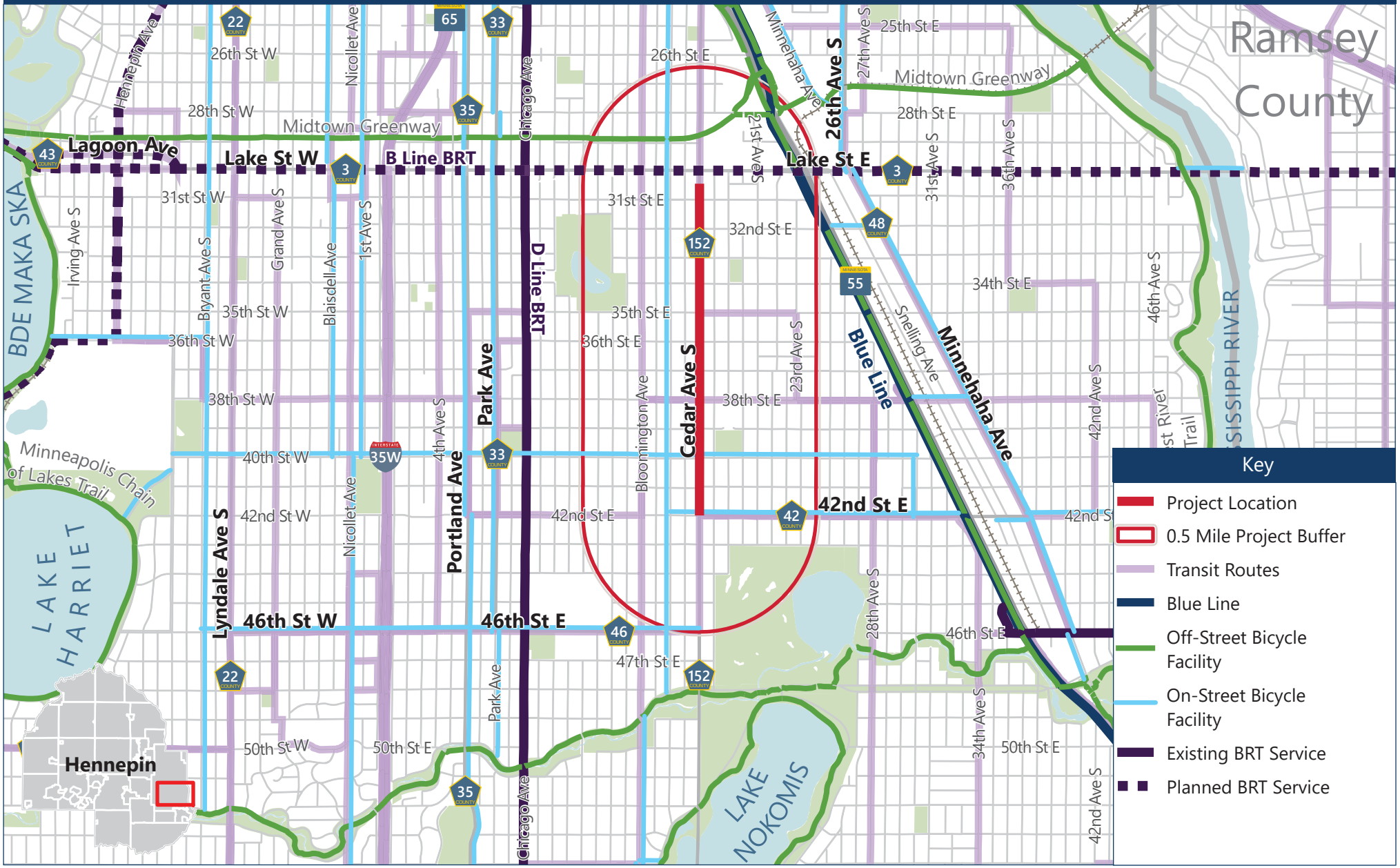
CSAH 152 (Cedar Ave) Phase 2 Reconstruction Project

Attachment 12 | Multimodal Connections Map



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

Publication date: 10/5/2023

Data sources (if applicable):

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

- Cedar Avenue South (CSAH 152) Reconstruction Phase 2: 42nd Street East (CSAH 42) to East Lake Street (CSAH 3)

Multimodal/Trail

- Park Avenue (CSAH 33) and Portland Avenue (CSAH 35) Bikeway Project: 38th Street East to the Midtown Greenway

Pedestrian Facilities

- Portland Avenue (CSAH 35) Pedestrian Upgrades: Diamond Lake Road to 350 ft north of 52nd Street East

Bridges

- Glenwood Avenue (CSAH 40) Bridge: Replacement/rehabilitation of Bridge #94282

At this time, Minneapolis has no funding programmed in its adopted 2023-2028 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. This maintenance commitment will require close coordination with city staff so that designs meet acceptable city standards, 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,

Jenifer Hager
Transportation Planning and Programming Director
Minneapolis Public Works

Metro Transit
a service of the Metropolitan Council

December 1, 2023

Carla Stueve, P.E.
Director and County Highway Engineer
Hennepin County Transportation Project Delivery
1600 Prairie Drive
Medina, MN 55340

Dear Ms. Stueve:

Metro Transit is supportive of Hennepin County's Regional Solicitation federal funding application for the proposed reconstruction project along CSAH 152 (Cedar Ave) from CSAH 42 (42nd St) to CSAH 3 (Lake St) in the City of Minneapolis. Parts of this segment of Cedar Avenue are served today by Route 14 and Route 22, with 11 existing bus stops. Metro Transit has also identified the West Broadway/Cedar corridor, planned along Cedar Avenue north of 38th Street, as a priority for arterial BRT expansion prior to 2040.

This project will involve the reconstruction of the existing roadway and will include, but is not limited to, the following elements: new pavement, curb, stormwater structures, traffic signals, sidewalk facilities, and ADA accommodations. The preferred typical section will be determined as part of the project development process based on characteristics of the project area, values of the community, as well as infrastructure, safety, and user needs. The proposed project will provide key first mile and last mile connections to current and future transit service in the corridor. It is anticipated that the project will improve accessibility, safety, and mobility for people walking, riding transit, biking, and driving.

We appreciate that the County intends to engage Metro Transit staff early and often during project development to discuss current and future transit needs along this street. We look forward to collaborating with the County in the project development process to accommodate transit needs.

Thank you for making us aware of this application and the opportunity to provide support.

Sincerely,

Lesley Kandaras
Lesley Kandaras (Nov 30, 2023 18:44 CST)

Lesley Kandaras
General Manager

CC: Nick Thompson, METRO Projects for Metro Transit
Katie Roth, Director, Arterial Bus Rapid Transit
Marilyn Porter, Director, Engineering & Facilities