



## Application

19838 - 2024 Roadway Modernization

20490 - CSAH 17 Corridor Improvements in Lake Elmo: CSAH 14 to 43rd St.

Regional Solicitation - Roadways Including Multimodal Elements

Status: Submitted  
Submitted Date: 12/13/2023 4:14 PM

## Primary Contact

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Pronouns First Name Middle Name Last Name

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**\***

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City State/Province Postal Code/Zip

651-430-4332  
Phone Ext.

**Fax:**

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

## Organization Information

**Name:** WASHINGTON CTY

**Jurisdictional Agency (if different):**

**Organization Type:**

**Organization Website:**

**Address:** PUBLIC WORKS  
11660 MYERON RD

**\***

**County:** STILLWATER Minnesota 55082  
City State/Province Postal Code/Zip

**Phone:** Washington 651-430-4325  
Ext.

**Fax:**

**PeopleSoft Vendor Number** 0000028637A10

## Project Information

**Project Name** CSAH 17 Corridor Improvements in Lake Elmo: CSAH 14 to 43rd St.

**Primary County where the Project is Located** Washington

**Cities or Townships where the Project is Located:** City of Lake Elmo

**Jurisdictional Agency (If Different than the Applicant):**

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

The proposed project will reconstruct approximately 0.8 miles of CSAH 17, an A-Minor Arterial, between CSAH 14 and 43rd St in the City of Lake Elmo. The project also includes reconstruction of the CSAH 17/CSAH 14 intersection. Existing conditions along the corridor include multiuse trails north of 39th St on the east and for a short distance south of 39th St on the west. The roadway segment today is undivided, with two travel lanes and right- and left-turn lanes at some public intersections. The corridor has one signalized intersection at CSAH 17/CSAH 14. Lake Elmo Elementary School and other educational uses are on the east side of the corridor near CSAH 14 and downtown Lake Elmo is just one quarter mile south east of the project. Residential uses including long standing, newly developed, and currently developing single family homes and senior living facilities line the corridor.

The project is a full reconstruction of the roadway. Improvements will include separating the two travel lanes with a raised median, adding curb, gutter, and stormwater improvements, adding turn lanes at all intersecting roadways, closing trail gaps to provide 10-foot multiuse trails along both sides of the roadway, adding a new marked pedestrian crossing with median refuge at 43rd St, and adding mid-block crossings north of the CSAH 17/CSAH 14 intersection and north of 39th St. In addition, the CSAH 17/CSAH 14 intersection will be converted to a single-lane roundabout with pedestrian crossings including pedestrian refuges in the splitter islands at each leg. The existing transit stops at this intersection will be improved and new accessible routes will be constructed for better access. All improvements will be ADA-compliant.

The proposed improvements to CSAH 17 and the intersection with CSAH 14 will support local and regional safety, mobility, and connectivity for all users. This project will tie in seamlessly with the planned interchange improvements at CSAH 17's intersection with Highway 36 to define the entry to downtown Lake Elmo from the north and west. Proposed improvements will aid in traffic calming and improved stormwater management balanced with the intensive growth adjacent to the corridor. Closing trail gaps and improving crossing locations will support non-motorized connections to amenities, education, transit, and recreation including the identified alignment of the Central Greenway Regional Trail along CSAH 14 (RBTN Tire 2 Alignment) with further connection to Lake Elmo Park Reserve, Cottage Grove Ravine Regional Park, and other regional destinations.

(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.** Reconstruct CSAH 17 (Lake Elmo Ave) from CSAH 14 (Stillwater Blvd) to 43rd St N

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)** 0.8

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** \$2,222,800.00

Minimum of 20% of project total

**Project Total** \$9,222,800.00

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

**Match Percentage** 24.1%

Minimum of 20%

Compute the match percentage by dividing the match amount by the project total

**Source of Match Funds** County 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

**Preferred Program Year**



Select one:

2029

Select 2026 or 2027 for TDM and Unique projects only. For all other applications, select 2028 or 2029.

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

Washington County

Functional Class of Road

A-Minor Arterial

Road System

CSAH

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

Road/Route No.

17

i.e., 53 for CSAH 53

Name of Road

Lake Elmo Ave N

Example; 1st ST., MAIN AVE

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

From:

CSAH 14

Road System

Road/Route No.

i.e., 53 for CSAH 53

Name of Road

Stillwater Blvd

Example; 1st ST., MAIN AVE

To:

DO NOT INCLUDE LEGAL DESCRIPTION

Road System

Road/Route No.

i.e., 53 for CSAH 53

Name of Road

43rd St N

Example; 1st ST., MAIN AVE

In the City/Cities of:

City of Lake Elmo

(List all cities within project limits)

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

0.8

(nearest 0.1 miles)

Primary Types of Work (check all the apply)

New Construction

Reconstruction

Yes

Resurfacing

Bituminous Pavement

Yes

Concrete Pavement

Roundabout

Yes

New Bridge

Bridge Replacement

Bridge Rehab

New Signal

Signal Replacement/Revision

Bike Trail

Yes

Other (do not include incidental items)

The project will include separating the two travel lanes, adding multiuse trails on both sides of the roadway, and reconstructing the CSAH 17/CSAH 14 intersection as a roundabout. The primary work types include grade work, aggregate base, bituminous base, bituminous surface, lighting, bike path, striping and crosswalk markings, and pedestrian ramps.

#### 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

55042

Approximate Begin Construction Date

03/01/2029

Approximate End Construction Date

10/31/2029

Miles of Trail (nearest 0.1 miles)

1.0

Miles of Sidewalk (nearest 0.1 miles)

0

Miles of trail on the Regional Bicycle Transportation Network (nearest 0.1 miles):

0

Is this a new trail?

Yes

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## Requirements - All Projects

### All Projects

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

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

Yes

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

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

Goal A: Transportation System Stewardship - Sustainable investments in the transportation system are protected by strategically preserving, maintaining, and operating system assets (Page 2.2). Objective A: Transportation System Stewardship (Page 2.2). Strategy A1 (Page 2.2).

Goal B: Safety and Security (Page 2.5). Objective A (Page 2.5), Strategy B1 (Page 2.5), Strategy B6 (Page 2.8).

Goal C: Access to Destinations (Page 2.10). Objective A (Page 2.10), Objective D (Page 2.10), Objective E (Page 2.10), Strategy C1 (Page 2.11), Strategy C2 (Page 2.11), Strategy C17 (Page 2.24).

Goal D: Competitive Economy (Page 2.26). Objective B (Page 2.26), Strategy D1 (Page 2.26), Strategy D3 (Page 2.27).

Goal E: Healthy and Equitable Communities (Page 2.30). Objective C (Page 2.30), Objective D (Page 2.30), Strategy E3 (Page 2.31), Strategy E6 (Page 2.34), Strategy E7 (Page 2.34).

Goal F: Leveraging Transportation Investment to Guide Land Use (Page 2.35), Objective C (Page 2.35), Strategy F7 (Page 2.38).

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 - Washington County Bike & Pedestrian Plan (2021) (pp.4-4 - 4-5) from this qualifying requirement because of their innovative nature.
- Washington County 2024-2028 Capital Improvement Plan (p.127)
  - Lake Elmo Comprehensive Plan (pp.6-24 ? 6-25)

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: 06/18/2015

Link to plan: <https://www.co.washington.mn.us/DocumentCenter/View/7981/Cover-page?bidId=>

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)	\$324,000.00
Removals (approx. 5% of total cost)	\$227,400.00
Roadway (grading, borrow, etc.)	\$701,200.00
Roadway (aggregates and paving)	\$1,538,400.00
Subgrade Correction (muck)	\$0.00
Storm Sewer	\$495,000.00
Ponds	\$248,000.00
Concrete Items (curb & gutter, sidewalks, median barriers)	\$1,322,000.00
Traffic Control	\$324,000.00
Striping	\$176,000.00
Signing	\$176,000.00
Lighting	\$292,000.00
Turf - Erosion & Landscaping	\$149,000.00
Bridge	\$0.00
Retaining Walls	\$0.00
Noise Wall (not calculated in cost effectiveness measure)	\$0.00
Traffic Signals	\$0.00
Wetland Mitigation	\$0.00
Other Natural and Cultural Resource Protection	\$0.00
RR Crossing	\$0.00
Roadway Contingencies	\$1,810,000.00
Other Roadway Elements	\$0.00
Totals	\$7,783,000.00

Specific Bicycle and Pedestrian Elements

CONSTRUCTION PROJECT ELEMENTS/COST ESTIMATES	Cost
Path/Trail Construction	\$879,840.00
Sidewalk Construction	\$0.00
On-Street Bicycle Facility Construction	\$0.00
Right-of-Way	\$0.00
Pedestrian Curb Ramps (ADA)	\$219,960.00
Crossing Aids (e.g., Audible Pedestrian Signals, HAWK)	\$0.00

Pedestrian-scale Lighting	\$0.00
Streetscaping	\$0.00
Wayfinding	\$0.00
Bicycle and Pedestrian Contingencies	\$340,000.00
Other Bicycle and Pedestrian Elements	\$0.00
<b>Totals</b>	<b>\$1,439,800.00</b>

## 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
<b>Totals</b>	<b>\$0.00</b>

## 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).*

<b>Response:</b>	Several elements of the proposed project are eligible to receive PROTECT funds, with a combined \$892,000 of eligible project costs. These include: 1) Storm Sewer (\$495,000); 2) Ponds (\$248,000); 3) Turf - Erosion & Landscaping (\$149,000). These improvements will increase resilience for the CSAH 17 corridor and adjacent communities through improved stormwater management, which will help decrease the magnitude and duration of flood events along the project.
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## Totals

Total Cost	\$9,222,800.00
Construction Cost Total	\$9,222,800.00
Transit Operating Cost Total	\$0.00

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

Existing Employment within 1 Mile:	1632
Existing Manufacturing/Distribution-Related Employment within 1 Mile:	146
Existing Post-Secondary Students within 1 Mile:	0
Upload Map	1702493773641_Attachment E_Make-a-Map Regional Economy Map.pdf
<i>Please upload attachment in PDF form</i>	

## 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
<i>(to the nearest 0.1 miles)</i>	

### Along Tier 2:

Miles:	0
<i>(to the nearest 0.1 miles)</i>	

**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:**

**None of the tiers:** Yes

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**Measure A: Current Daily Person Throughput**

**Location** CSAH 17 at 43rd St N

**Current AADT Volume** 4750

**Existing Transit Routes on the Project** 294

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

**Upload Transit Connections Map** 1702493862770\_Attachment F\_Make-a-Map Transit Connections.pdf

*Please upload attachment in PDF form*

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**Response: Current Daily Person Throughput**

**Average Annual Daily Transit Ridership** 0

**Current Daily Person Throughput** 6175.0

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**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**

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**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:**

The project area is home to many children and older adults. FHWA's Screening Tool for Equity Analysis of Projects (STEAP) estimates that within a 1/2 mile of the project corridor, 32% of the population is under 18 years old--compared to 24% in Washington County and 23% statewide. The Lake Elmo Elementary School is located at the southern end of the corridor and serves residents of Cimarron Park, a nearby mobile home community. This school building also houses Amigos Unidos Spanish Immersion school. While the immediate project area has few Hispanic residents, 7% of City of Lake Elmo residents identify as Hispanic, compared to 4% throughout the County. The County supports ongoing coordination with the school related to access and other transportation issues that students and staff experience. It should be noted that there are plans to relocate Lake Elmo Elementary school in the future, but for the purposes of this application it is assumed the current building and amenities will remain a destination for children and families due to the high concentration of youth in this area.

Arbor Glen Senior Living (Arbor Glen) is adjacent to CSAH 17 near the middle of the project corridor. County staff met with the Arbor Glen community on October 10th, 2023 to discuss this project. The County prioritized meeting people where they are in a way that is convenient for them--this meeting consisted of a panel-style discussion held in person at Arbor Glen. Corridor needs for both CSAH 17 and CSAH 14 were discussed, and pedestrian and mobility continuity and connections were highlighted as key concerns.

In-depth and broad engagement was conducted for the County Bike and Pedestrian Plan in 2019 and 2020. This engagement identified strong support for pedestrian improvements along and across CSAH 17, which have been incorporated into the design. The County has also worked with local businesses, in particular Gorman's (a family-owned restaurant at the sound end of the corridor), to ensure supported site access.

The project's purpose and need was identified primarily through engineering analysis and supported through planning and initial engagement efforts. As this project is still in the early stages of design, future public engagement will expand on these focused conversations held to date. Washington County Public Works has an approved Title VI plan which serves as a resource for nondiscrimination in all project planning and engagement practices. Following typical practices, the County will facilitate engagement to ensure final design is informed by a community-driven process, with multiple touch points with the public and elected officials. Engagement strategies will include open houses, maintaining a project website, surveys, online comment maps, & pop-up meetings.

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



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:**

This project provides transportation and public health benefits to disadvantaged populations, specifically transportation-vulnerable youth and older adults through the construction of facilities for non-motorized users and improved pedestrian crossing facilities. As described in item 3A above, the project area includes two facilities that serve or house disadvantaged populations ? the Arbor Glen Senior Living facility and the Lake Elmo Elementary schools. Additionally, approximately 280-acres adjacent to CSAH 17 has been recently--or is currently--being developed with single family homes; this development is anticipated to greatly increase the number of children in the area.

This project adds continuous ADA-compliant multiuse facilities along both sides of CSAH 17, with enhanced pedestrian crossings along the corridor, including a trail crossing at 43rd Street. The construction of a single lane roundabout at the intersection with CSAH 14 will be a major pedestrian crossing improvement supporting improved access to downtown Lake Elmo, the library, the Central Greenway Regional Trail (alignment along CSAH 14 to the east), and Lake Elmo Park Reserve to the southwest.

There are transit stops at the intersection with CSAH 14, route 294 with express service between downtown St. Paul and Stillwater. At present, no non-motorized facilities are provided to connect residents with these stops, meaning that riders must walk on the grass or in the road to access the bus. The new multiuse paths and enhanced non-motorized crossings along the corridor will provide direct, safe, and ADA-compliant access to transit corridor residents. The project will also provide safe, accessible bus stop facilities, which currently only consist of a sign.

This project promotes active transportation by providing a new option for non-motorized travel between neighborhoods and a variety of destinations, and provides enhanced options for recreation with trail connections to existing trails and future regional trail alignments. Improvements for motorists include travel time improvements along CSAH 17 and reduced delay at all intersections through the addition of turn lanes and the construction of a roundabout at CSAH 14.

There are no known negative impacts associated with this project.

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

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## Measure C: Affordable Housing Access



Describe any affordable housing developments?existing, under construction, or planned?within 1/2 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 1/2 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:

There are no publicly subsidized rental housing units identified on the Socio-Economic Conditions map. There are also no known naturally-occurring or planned affordable housing units at this time. However, the City of Lake Elmo is experiencing unprecedented levels of growth and the infrastructure in this project is being designed to support all current and future users in all housing types. As mentioned above, while not located within the immediate project area, this corridor and the CSAH 14 intersection is a key route for the students and families who attend Lake Elmo Elementary School and the Amigos Unidos Spanish Immersion school and reside in the Cimarron Park mobile home community.

(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):

Project located in a census tract that is below the regional average for population in poverty or populations of color (Regional Environmental Justice Area): Yes

Upload the ?Socio-Economic Conditions? map used for this measure. 1702494169271\_Attachment C\_Make-a-Map Socio-Economic Conditions.pdf

Measure A: Year of Roadway Construction

Year of Original Roadway Construction or Most Recent Reconstruction	Segment Length	Calculation	Calculation
			2
1964	0.8	1571.2	1964.0
	1	1571	1964

Total Project Length

Total Project Length (as entered in "Project Information" form) 0.8

Average Construction Year

Weighted Year 1964

Total Segment Length (Miles)

Total Segment Length 0.8

Measure B: Geometric, Structural, or Infrastructure Improvements

Improved roadway to better accommodate freight movements: Yes

Response:

The existing CSAH 17/CSAH 14 configuration is an acute angled intersection with a sharp turn on the northeast corner. This configuration presents challenges for larger vehicles, including trucks and freight carriers, whose longer wheelbase makes it more difficult to navigate the tight turn without encroaching into adjacent lanes or risking conflicts with other vehicles. The new CSAH 17/CSAH 14 roundabout will address these challenges by providing larger turning radii, continuous, predictable traffic flow, and truck aprons that can safely allow for the over tracking of semis, oversize vehicles, and vehicles with large trailers.

(Limit 700 characters; approximately 100 words)

Improved clear zones or sight lines:

Yes

**Response:**

The existing acute angled CSAH 17/CSAH 14 intersection restricts clear zones and sight lines, impacting visibility and safety for travelers. At present, drivers, pedestrians, and cyclists arriving at the intersection from the north or east experience reduced visibility of approaching traffic, diminishing reaction times and increasing the risk of collisions. The new CSAH 17/CSAH 14 roundabout will eliminate the sharp northeastern corner, provide a continuous flow of traffic, and minimize potential blind spots through larger turning radii and open space in the center to allow unobstructed views.

*(Limit 700 characters; approximately 100 words)*

**Improved roadway geometrics:**

**Response:**

Yes

Project improvements will separate lanes with a raised median and provide a roundabout at the CSAH 17/CSAH14 intersection. The raised median will increase safety by preventing head-on collisions, support consistent traffic flow, and provide pedestrian refuges at various crossing locations. Raised medians also have a visual narrowing effect, naturally promoting slower driving speeds and increased caution. The new roundabout will provide a range of benefits compared to the existing conventional intersection including traffic calming, reduced conflict points, and improved pedestrian crossings.

*(Limit 700 characters; approximately 100 words)*

**Access management enhancements:**

**Response:**

Yes

The south leg of the new CSAH 17/CSAH14 roundabout will extend along the western edge of the Gorman's restaurant parking lot, providing improved business access and access to an identified future 20-acre residential development site in the southwest quadrant of the intersection. This will relieve pressure on the single existing access to Gorman's, which is located directly on CSAH 14, and help accommodate increases in travel demand generated by the new development. The additional access will be essential for supporting operations and safety at the CSAH 17/CSAH14 intersection, and along CSAH 14, as the area continues to develop.

*(Limit 700 characters; approximately 100 words)*

**Vertical/horizontal alignment improvements:**

**Response:**

Yes

The reconstructed CSAH 17 corridor will include a raised center median and multiuse paths along both sides of the roadway. These improvements may have additional space requirements beyond the current corridor footprint. The project will avoid impacts to adjacent properties to the extent possible by incorporating centerline realignments and other horizontal alignment improvements as feasible.

The new CSAH 17/CSAH14 roundabout will provide a variety of horizontal alignment improvements related to its design. The circular shape will ensure a consistent flow of traffic and eliminate the sharp angle present at the existing intersection.

There are no existing vertical curve issues to address.

*(Limit 700 characters; approximately 100 words)*

**Improved stormwater mitigation:**

**Response:**

Yes

Washington County worked with the City of Lake Elmo to create a regional stormwater treatment approach for this corridor by collaborating on a shared stormwater pond with adjacent development. Capacity for stormwater ponds account for the roadway & development needs with collected water being reused for irrigation within the developments. This approach will apply to all new development along the project corridor.

The project will include curb & gutter elements for effective stormwater mitigation. This system will direct stormwater away from the road & surrounding areas to prevent flooding & erosion, enhance safety, & contribute to a resilient corridor by mitigating the impact of storms.

*(Limit 700 characters; approximately 100 words)*

**Signals/lighting upgrades:**

Yes

Response:

The existing traffic signal at CSAH 17/CSAH 14 will be upgraded to a roundabout. The roundabout will provide improved lighting for pedestrians and vehicles including LED streetlights placed around the perimeter of the roundabout to ensure consistent illumination. Additional lighting elements, including lighting features within the central island, may also be incorporated for enhanced visibility at night. All lighting will be compliant with the City of Lake Elmo's dark sky policy.

(Limit 700 characters; approximately 100 words)

Other Improvements

Response:

Yes

Multimodal conditions along the corridor are inadequate, with trails only available for short, disconnected segments. Marked crossings are only available at the CSAH 17/CSAH 14 intersection, & no trails or sidewalks are provided to reach them. The project will add continuous trails on each side of the roadway & provide high-visibility, two-stage crossings at 43rd St, mid-block north of 41st St, mid-block north of CSAH 14, and at the new CSAH 17/CSAH 14 roundabout. Pedestrian refuges will be added at splitter islands at the roundabout & at the new 43rd St crossing. These improvements will support non-motorized trips, improve access to transit, & encourage active transportation.

(Limit 700 characters; approximately 100 words)

Measure A: Congestion Reduction/Air Quality										Synchro or HCM Reports
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.		
13.4	10.6	2.8	4882	4882	65418.8	51749.2	13669.6	N/A		1702495124012_Attachment G_CSAH 17_Traffic Packet.pdf
										51749

Vehicle Delay Reduced		
Total Peak Hour Delay Reduced	Total Peak Hour Delay Reduced	Delay Reduced Total

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):
20.1	18.8	1.3
20	19	1

Total	
Total Emissions Reduced:	1.3
Upload Synchro Report	1702495281859_Attachment G_CSAH 17_Traffic Packet.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 Roadways0

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:CMF ID 4264: Convert signalized intersection to modern roundabout

(Limit 700 Characters; approximately 100 words)

Rationale for Crash Modification Selected:The above crash modification factor was selected as it was directly related to the proposed improvement and construction of a single-lane roundabout and was highly rated (4-stars) compared to other crash modification factors reviewed.

(Limit 1400 Characters; approximately 200 words)

Project Benefit (\$) from B/C Ratio\$0.06

Total Fatal (K) Crashes:0

Total Serious Injury (A) Crashes:0

Total Non-Motorized Fatal and Serious Injury Crashes:0

Total Crashes:2

Total Fatal (K) Crashes Reduced by Project:0

Total Serious Injury (A) Crashes Reduced by Project:	0
Total Non-Motorized Fatal and Serious Injury Crashes Reduced by Project:	0
Total Crashes Reduced by Project:	1
Worksheet Attachment	1702495540157_Attachment I_Crash_BC.pdf
Please upload attachment in PDF form	

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### Roadway projects that include railroad grade-separation elements:

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

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### 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:**

The CSAH 17 corridor has a diverse land use context including schools & commercial uses on the south and residential uses at the center and north. The future Central Greenway Regional Trail will cross the project along CSAH 14 and connect with downtown Lake Elmo, which is located less than ¼ miles to the east. Given the corridor's diverse users, including school children and senior living facility residents, the project has been designed to provide for safe and accessible travel along CSAH 17 & crossing improvements of both CSAH 17 & CSAH 14. Improvements include new, two-stage crossings at 43rd St, a new mid-block crossing between 39th St and 41st St, a new mid-block crossing north of CSAH 14, and a new roundabout with crossings at CSAH 14. At present, the CSAH 17/CSAH 14 intersection is the only marked crossing location.

On the north, CSAH 17 at 43rd St is a side street stop-controlled intersection without a marked crossing. To the east, an existing trail runs south along CSAH 17 to 39th St and another connects east to a local trail network. These trails serve adjacent residential uses, including Arbor Glen Senior Living, providing for non-motorized travel between residences and schools, parks, businesses, and downtown. At present, all non-motorized traffic wanting to cross the corridor safely must travel south along the roadway shoulder or grass to the marked crossing at CSAH 17/CSAH 14. The existing CSAH 17/CSAH 14 intersection has a large crossing distance of approximately 110'. Crossing ramps are not ADA-compliant and striping is faded.

Marked crossings will be added on the west and north legs of the 43rd St intersection, with a pedestrian refuge island included on the north crossing. North of 39th St, a new mid-block crossing will create a link between the existing path at Arbor Glen Senior Living and the new path on the west. Another mid-block crossing will be provided at Lake Elmo Elementary School. At the CSAH 17/CSAH 14 intersection, improvements will include a roundabout with crossings at east, west, and south legs and splitter islands with pedestrian refuges. All crossings will include high-visibility signage and be ADA-compliant with appropriate ramp slopes and tactile paving at ramps.

These new and enhanced crossings will provide for safe, accessible, and convenient travel for residents. They will eliminate the circuitous routes necessary to reach a safe crossing and enhance access to the future Central Greenway Trail and downtown Lake Elmo. Importantly, they will support travel for transportation disadvantaged residents, including the elderly and children. When combined with the new north-south trails, new crossings will provide east-west continuity and support a safe and connected multimodal system along this section of CSAH 17.

*(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:**

The signalized intersection at CSAH 17 and CSAH 14 will be removed and reconstructed as a single-lane roundabout. This will provide a range of pedestrian safety benefits compared to existing conditions. Eliminating left turns through the intersection will reduce conflict points and minimize the chances of pedestrian-vehicle collisions. Pedestrians will find it easier to judge traffic speed and find gaps due to the continuous, one-way flow of vehicles. In addition, splitter islands with pedestrian refuges will reduce total crossing distances and provide two-stage crossing, allowing pedestrians to cross one direction of traffic at a time. Pedestrians will benefit from the range of downstream traffic calming effects of roundabouts resulting from their circular geometry, yielding requirements, and other design characteristics.

*(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:**

Yes

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

**Response:**

1

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

**Response:**

While total curb-to-curb roadway width along the corridor will increase slightly as a result of separating travel lanes, crossing distances for pedestrians will overall be reduced. The new center median will be incorporated as a pedestrian refuge island at various crossing locations, including the crossing at 43rd St and the mid-block crossings north of 39th St and north of the new CSAH 17/CSAH 14 roundabout, which were specifically selected based on the reduced crossing distance for pedestrians. In addition, the new CSAH 17/CSAH 14 roundabout will reduce crossing distances and provide splitter islands with pedestrian refuges on the west, east, and south legs of the intersection. These new two-stage crossings will provide pedestrians the safety benefits of needing to cross only one direction of traffic at a time.

(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:**

No grade-separated crossings are being proposed.

(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:**

No mid-block crossings will be restricted or blocked.

(Limit 1,400 characters; approximately 200 words)

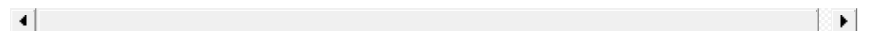
**2. Describe how motorist speed will be managed in the project design, both for through traffic and turning movements.** Describe any project-related factors that may affect speed directly or indirectly, even if speed is not the intended outcome (e.g., wider lanes and turning radii to facilitate freight 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 proposed project improvements will help manage motorist speed in several ways. At the CSAH 17/CSAH 14 intersection, conversion of the signalized intersection to a roundabout will naturally encourage drivers to slow as they navigate a curved path. The need to yield to circulating traffic and the continuous flow within the roundabout will contribute to more consistent speeds and reduce abrupt stopping and starting. Drivers will no longer be tempted to accelerate to "beat" a yellow light, reducing the risk of high-speed, high-severity crashes. MnDOT reports that, as of 2021, roundabouts in the state have shown a 57-63% reduction in pedestrian related crashes and a 3-16% reduction in bicycle related crashes. Overall, Minnesota roundabouts have experienced more than an 80% reduction in fatal and serious injury crashes.

The addition of curb and gutter and the raised median added to separate lanes will support organized traffic flow, preventing weaving and providing a clear and predictable path for drivers. This will aid motorists in maintaining controlled speeds and encourage driver awareness. The addition of curbs as a vertical element will also result in a visual narrowing effect, naturally promoting slower driving speeds and increased caution. Adding trails on both sides of the road will introduce a more urban, active context that cues drivers to slow down. Physically separating lanes will reduce the risk of head-on collisions, which tend to be more severe.

Finally, the new crossings at 43rd St N, north of 39th St, and north of the new CSAH 17/CSAH 14 roundabout will provide enhanced visibility and protection for pedestrians crossing the roadway. The crossings will include high-visibility crosswalk markings and signage and will be ADA-compliant with appropriate ramp slopes and tactile paving. The crossings will include pedestrian refuge islands for two-phase crossing. These improvements will support increased driver awareness, slower driver speeds, and increased visibility of crossing pedestrians.



(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 posted speed along the corridor is 55 mph. No increase in posted speed is proposed as part of the project. The new roundabout will reflect design speed specifications as provided by USDOT, which show a design speed for urban single-lane roundabouts of 20 mph. Upon completion of construction a speed study will be conducted with the intention of identifying design decisions that will bring speeds down.

(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

List the AADT

**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 current transit stops on CSAH 14 are just signs in the grass at the edge of the roadway, and a potential source of pedestrian exposure. The transit stops will be improved to accessible stops and connected by new trail, as described elsewhere.

The corridor is located within 500' of Lake Elmo's downtown, a bustling business and entertainment district located along CSAH 14 to the east and extending south along CSAH 17. The downtown includes a variety of destinations such as No Neck Tony's and Twin Point Tavern restaurants, the Lake Elmo Event Center, the Lake Elmo Library, and variety of other shops, parks, and institutional uses.

Gorman's, a popular family-friendly restaurant, is located at the sound end of the project. The southern leg of the CSAH 17/CSAH 14 roundabout will extend south along the west edge of Gorman's parking lot and provide an additional access point. New multiuse trails will provide non-motorized access to the restaurant.

The future Central Greenway Regional Trail will run east along CSAH 14 through downtown Lake Elmo. The project's multimodal improvements will connect with the Central Greenway Regional Trail on the south, providing corridor residents an uninterrupted multimodal connection to the range of destinations located in downtown Lake Elmo and beyond.

(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:

The corridor is within 500' of a variety of pedestrian generators. These include educational facilities and senior/independent living facilities. Lake Elmo Elementary School and Amigos Unidos Spanish Immersion School are located northeast of the CSAH 17/CSAH 14 intersection. North of this, Time for Me Early Learning Center and Lake Elmo City Hall are located south of 39th St N. Arbor Glen Senior Living and The Fields at Arbor Glen Independent Living Apartments are located north of 39th St N. A variety of additional pedestrian generators are located throughout downtown Lake Elmo to the east.

(Limit 1,400 characters; approximately 200 words)

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## Measure A: Multimodal Elements and Existing Connections

Response:

Non-motorized needs along the project corridor will continue to grow, not only for adjacent residents, but for regional users who will increasingly rely on this segment of CSAH 17 as larger multimodal networks are developed. The project will add continuous multiuse trails on each side of the roadway from CSAH 14 to 43rd St and will provide high-visibility crossings at 43rd St, mid-block north of 41st St, mid-block north of CSAH 14, and at the new CSAH 17/CSAH 14 roundabout. The two existing transit stops on CSAH 14, which consist of signs adjacent to the roadway, will be replaced by accessible stops connected by the new trails. Given the corridor's rapid development, these improvements will provide safety benefits for non-motorized travel and enhance the connectedness and accessibility of multimodal networks.

Multimodal conditions along the corridor are currently inadequate, with trails only available north of 39th St on the east and for a short distance south of 39th St on the west. The only marked crossings are at the CSAH 17/CSAH 14 intersection, and no trails or sidewalks are provided to reach them. With both Arbor Glen Senior Living and Lake Elmo Elementary located along the corridor, these conditions are particularly concerning for elderly residents and children. The corridor's multimodal needs are reflected in the Lake Elmo Comprehensive Plan, which calls for trails to be added the full length of CSAH 17.

On the north, a high-visibility crossing at 43rd St will connect the new trails on both sides of the corridor and link with the existing trail on the east. On the south, crossings at the new CSAH 17/CSAH 14 roundabout will provide multimodal access to Gorman's restaurant and many other destinations in downtown Lake Elmo. North of 39th St and north of CSAH 14, new mid-block crossings will link Arbor Glen Senior Living and Lake Elmo Elementary, respectively, to the new trail on the west of the corridor. This will provide a safe route to school and allow for elderly and transportation disadvantaged residents to enjoy accessible travel within the community.

The project will enhance the corridor as a link within larger multimodal networks. CSAH 14 on southern terminus is both an RBTN Tier 2 Corridor and part of the Lake Elmo Segment of the Central Greenway Regional Trail. Multimodal improvements will address 2040 Transportation Policy Plan Regional Bicycle Barriers, with the project located within both Tier 2 and Tier 3 Rail Barrier Crossing Areas. Both the Central Greenway Trail and RBTN network cross the rail line at Kelvin Avenue, helping bridge this significant multimodal barrier and supporting north-south travel to Lake Elmo Park Reserve, Cottage Grove Ravine Regional Park, and other destinations throughout the region.

(Limit 2,800 characters; approximately 400 words)

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## 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.** Yes

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.**

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:**

The County met with Arbor Glen Senior Living on October 10th, 2023 to understand the needs of this vulnerable older population related to the CSAH 17 project corridor. As mentioned above, this facility provides assisted living, independent living, and memory care housing for older adults. This meeting took place in person on-site to best accommodate their needs and make attendance convenient. There was a panel-style discussion where project team members could answer questions and hear input from these community members.

Other meetings of a more broad scope but related to this project have taken place with local business and School District staff. The County has ongoing coordination with the school related to access and other transportation issues that students and staff experience. While these meetings have not been specific to this project, the team has taken staff feedback to understand corridor needs along the corridor and in the area and design improvements that are relevant.

Washington County has engaged with the City of Lake Elmo on project status and decisions through its monthly coordination meetings with the City. The County has also worked with the developer of the planned project in the northwest quadrant of the CSAH 14 & CSAH 17 to arrange a water re-use stormwater pond and other water runoff elements associated with the project. Such monthly meetings will continue to provide for regular communication between the County and principal stakeholders as the project progresses through planning and implementation.

The County executed thorough engagement efforts for the County Bike and Pedestrian Plan in 2020. While these engagement efforts were also not specific to the CSAH 17 project, engagement via in person pop-up events at community destinations and online interactive maps and surveys showed strong support for pedestrian improvements along and across CSAH 17. Over 2,000 people accessed these tools via the project website: <https://www.co.washington.mn.us/bikepedplan>.

As this project is still in the early stages of design, future public engagement will expand on these focused conversations held to date.

*(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

1702497174080\_Attachment B\_CSAH 17\_Layout.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%

<b>Measure A: Cost Effectiveness</b>		
Total Project Cost (entered in Project Cost Form):		\$9,222,800.00
Enter Amount of the Noise Walls:		\$0.00
Total Project Cost subtract the amount of the noise walls:		\$9,222,800.00
Enter amount of any outside, competitive funding:		\$0.00
Attach documentation of award:		
Points Awarded in Previous Criteria		
Cost Effectiveness		\$0.00

<b>Other Attachments</b>		
<b>File Name</b>	<b>Description</b>	<b>File Size</b>
Attachment A_One-Pager.pdf	One Page Project Summary	1.4 MB
Attachment D_Make-a-Map Level of Congestion.pdf	Make A Map - Level of Congestion	3.0 MB
Attachment H_Crash Summary.pdf	2020-2022 Crash Summary	54 KB
Attachment J_CMF Documentation.pdf	Crash Modification Factor Documentation	99 KB
Attachment K1_2023-141 Reg Sol_Wash Co Resolution of Support SIGNED_v1.pdf	Washington County Resolution of Support	21.2 MB
Attachment K2_Lake Elmo CSAH 17 Improvements LOS-signed_v1.pdf	Letter of Support from City of Lake Elmo	21.5 MB
Attachment L_Existing Conditions_CSAH 17 Improvements in Lake Elmo.pdf	Existing Conditions Photos	1.4 MB

# Regional Economy

Roadway Reconstruction/Modernization Project: CSAH 17 Corridor Improvements in Lake Elmo: CSAH 14 to 43rd

## Results

**WITHIN ONE MI** of project:  
Postsecondary Students: 0

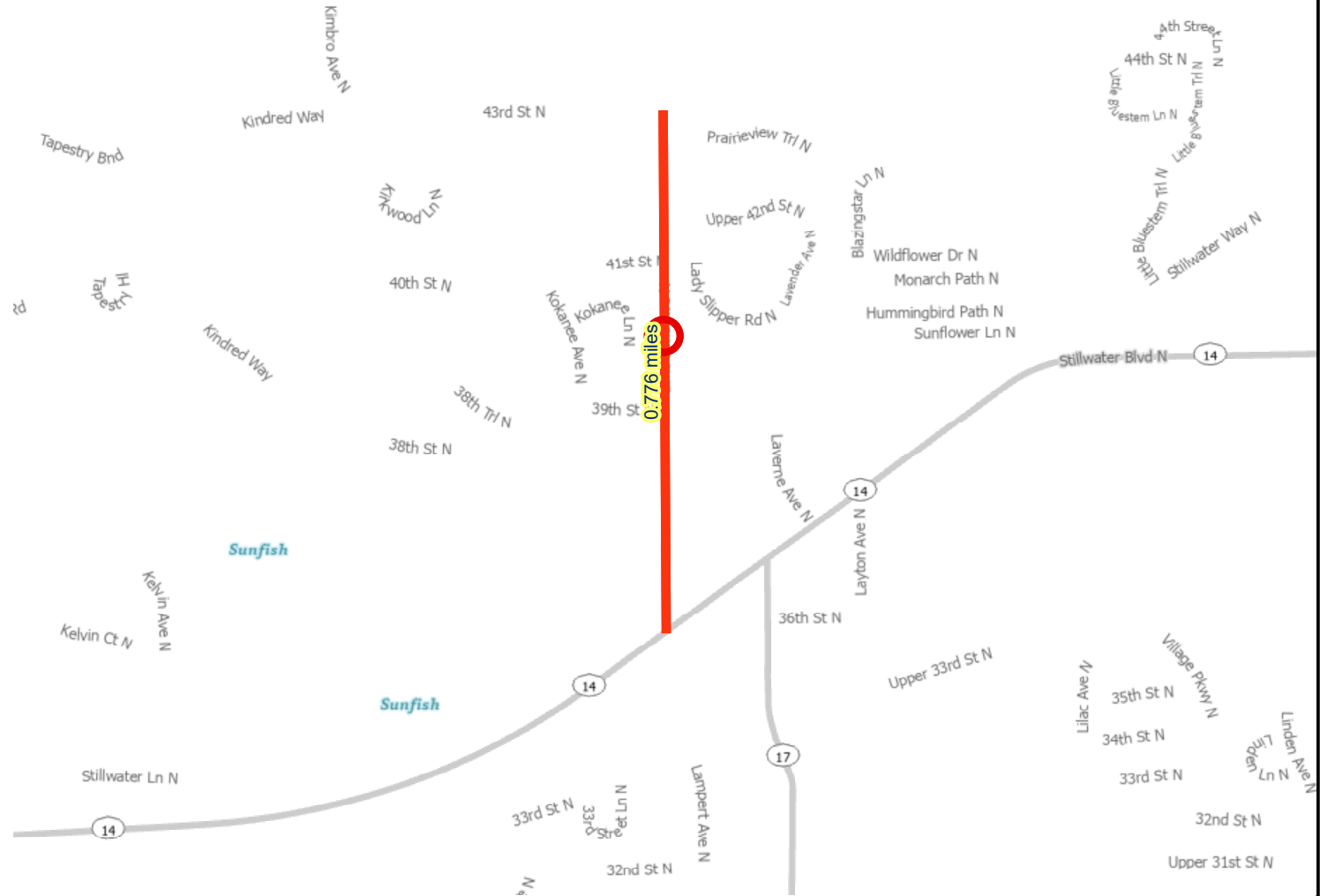
Totals by City:

### Baytown Twp.

Population: 811  
Employment: 29  
Mfg and Dist Employment: 10

### Lake Elmo

Population: 3687  
Employment: 1603  
Mfg and Dist Employment: 136



Project Points



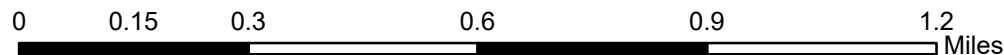
Manufacturing/Distribution Centers



Project



Job Concentration Centers



Created: 10/30/2023  
LandscapeRSA5



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



Transit Connections

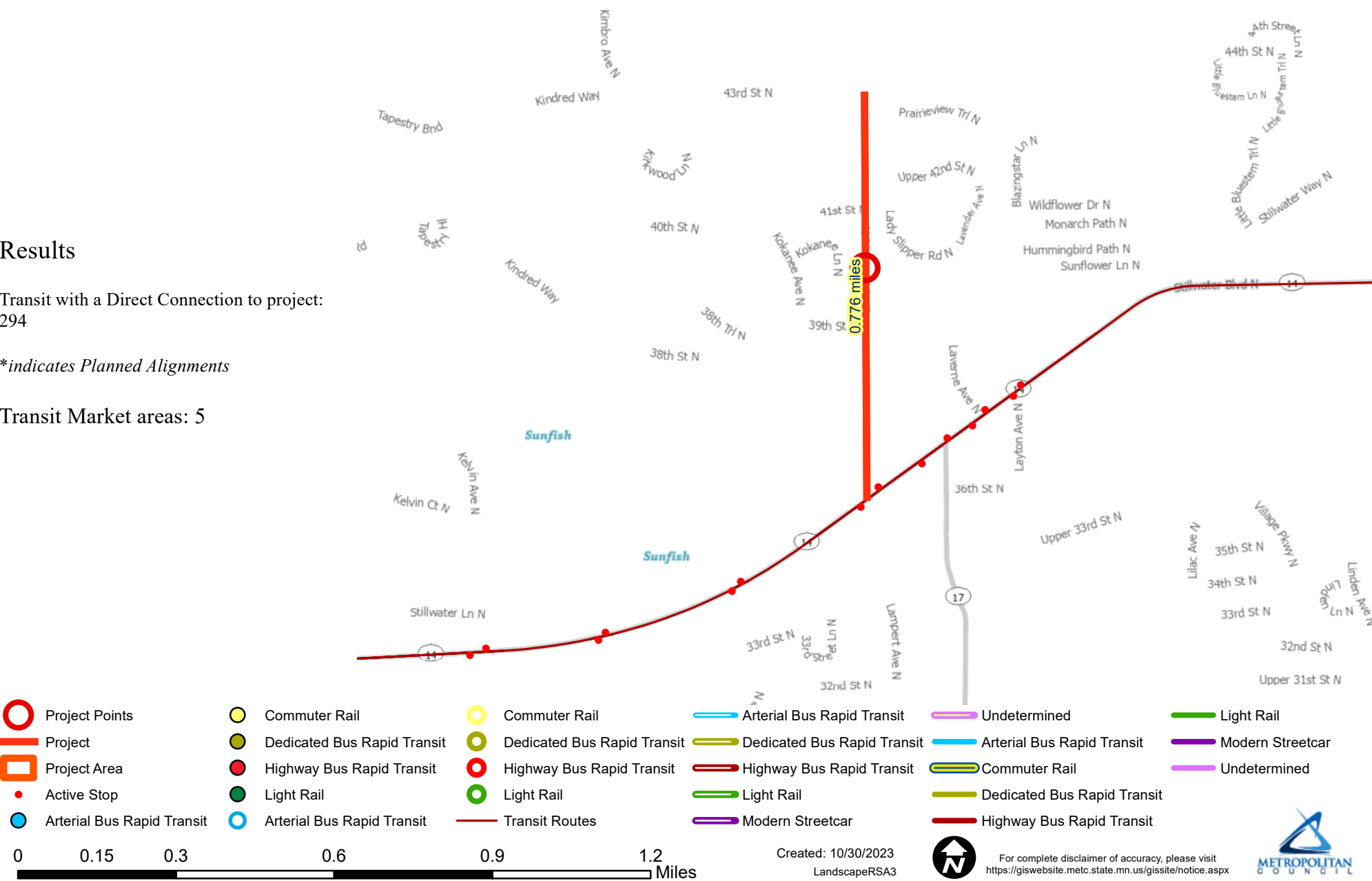
Roadway Reconstruction/Modernization Project: CSAH 17 Corridor Improvements in Lake Elmo: CSAH 14 to 43rd

Results

Transit with a Direct Connection to project:  
294

*\*indicates Planned Alignments*

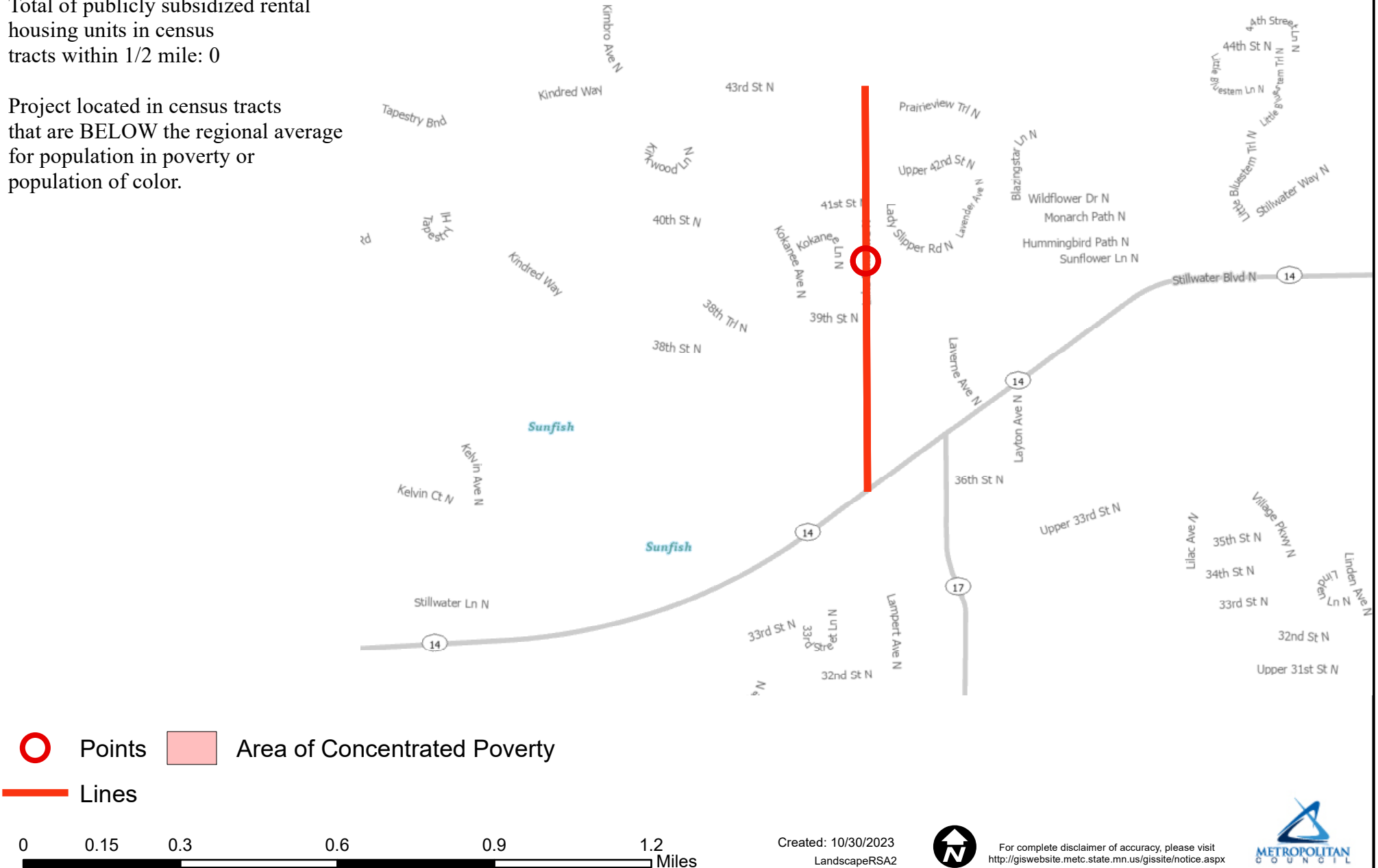
Transit Market areas: 5



## Results

Total of publicly subsidized rental housing units in census tracts within 1/2 mile: 0

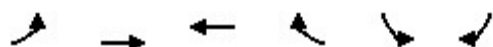
Project located in census tracts that are BELOW the regional average for population in poverty or population of color.



# Lanes, Volumes, Timings

101: Stillwater Blvd / CSAH 14 & Lake Elmo Ave N/ CSAH 17

11/08/2023



















Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4	Ø8
Lane Configurations								
Traffic Volume (vph)	142	511	313	109	178	112		
Future Volume (vph)	142	511	313	109	178	112		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Storage Length (ft)	240			0	0	305		
Storage Lanes	1			1	1	1		
Taper Length (ft)	50				25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Frt				0.850		0.850		
Flt Protected	0.950				0.950			
Satd. Flow (prot)	1752	1845	1845	1568	1752	1568		
Flt Permitted	0.562				0.950			
Satd. Flow (perm)	1037	1845	1845	1568	1752	1568		
Right Turn on Red				Yes		Yes		
Satd. Flow (RTOR)				124		124		
Link Speed (mph)		55	40		55			
Link Distance (ft)		359	204		953			
Travel Time (s)		4.5	3.5		11.8			
Peak Hour Factor	0.87	0.88	0.95	0.88	0.87	0.90		
Adj. Flow (vph)	163	581	329	124	205	124		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	163	581	329	124	205	124		
Enter Blocked Intersection	No	No	Yes	Yes	No	No		
Lane Alignment	Left	Left	Left	Right	Left	Right		
Median Width(ft)		12	20		12			
Link Offset(ft)		0	0		0			
Crosswalk Width(ft)		16	16		16			
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Turning Speed (mph)	15			9	15	9		
Number of Detectors	1	2	2	1	1	1		
Detector Template	Left	Thru	Thru	Right	Left	Right		
Leading Detector (ft)	20	100	100	20	20	20		
Trailing Detector (ft)	0	0	0	0	0	0		
Detector 1 Position(ft)	0	0	0	0	0	0		
Detector 1 Size(ft)	20	6	6	20	20	20		
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		
Detector 1 Channel								
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0		
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0		
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0		
Detector 2 Position(ft)		94	94					
Detector 2 Size(ft)		6	6					
Detector 2 Type		Cl+Ex	Cl+Ex					
Detector 2 Channel								
Detector 2 Extend (s)		0.0	0.0					
Turn Type	Perm	NA	NA	Perm	Prot	Prot		
Protected Phases		2	6		7	3	4	8
Permitted Phases	2			6				



# Lanes, Volumes, Timings

101: Stillwater Blvd / CSAH 14 & Lake Elmo Ave N/ CSAH 17






















11/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	142	511	1	2	313	109	1	0	3	178	0	112
Future Volume (vph)	142	511	1	2	313	109	1	0	3	178	0	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	240		0	0		0	0		0	0		305
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	50			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.963			0.899			0.949	
Flt Protected		0.989						0.988			0.970	
Satd. Flow (prot)	0	1824	0	0	1776	0	0	1638	0	0	1698	0
Flt Permitted		0.989						0.988			0.970	
Satd. Flow (perm)	0	1824	0	0	1776	0	0	1638	0	0	1698	0
Link Speed (mph)		55			40			30			55	
Link Distance (ft)		359			204			332			953	
Travel Time (s)		4.5			3.5			7.5			11.8	
Peak Hour Factor	0.87	0.88	0.92	0.92	0.95	0.88	0.92	0.92	0.92	0.87	0.92	0.90
Adj. Flow (vph)	163	581	1	2	329	124	1	0	3	205	0	124
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	745	0	0	455	0	0	4	0	0	329	0
Enter Blocked Intersection	No	No	No	No	Yes	Yes	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			20			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	
Intersection Summary												
Area Type:	Other											
Control Type:	Roundabout											
Intersection Capacity Utilization	91.4%				ICU Level of Service F							
Analysis Period (min)	15											

# Lanes, Volumes, Timings

102: Lake Elmo Ave N/ CSAH 17 & 39th St N





















11/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	18	2	59	44	336	15	30	269	40
Future Volume (vph)	0	0	0	18	2	59	44	336	15	30	269	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		175	0		0	340		195	320		295
Storage Lanes	0		1	0		0	1		1	1		1
Taper Length (ft)	25			25			200			170		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.904				0.850			0.850
Flt Protected					0.988		0.950			0.950		
Satd. Flow (prot)	0	1845	1845	0	1648	0	1752	1845	1568	1752	1845	1568
Flt Permitted					0.988		0.950			0.950		
Satd. Flow (perm)	0	1845	1845	0	1648	0	1752	1845	1568	1752	1845	1568
Link Speed (mph)		30			30			55			55	
Link Distance (ft)		577			559			794			1152	
Travel Time (s)		13.1			12.7			9.8			14.3	
Peak Hour Factor	1.00	1.00	1.00	0.75	0.50	0.87	0.69	0.88	0.63	0.75	0.86	0.83
Adj. Flow (vph)	0	0	0	24	4	68	64	382	24	40	313	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	96	0	64	382	24	40	313	48
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	35.8%						ICU Level of Service A					
Analysis Period (min)	15											

# Lanes, Volumes, Timings

103: Lake Elmo Ave N/ CSAH 17/CSAH 17 & 41st St N












11/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	0	0	18	0	24	13	361	29	15	304	3
Future Volume (vph)	7	0	0	18	0	24	13	361	29	15	304	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	250		250	245		235
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (ft)	25			25			135			140		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.919				0.850			0.850
Flt Protected		0.950			0.980		0.950			0.950		
Satd. Flow (prot)	0	1752	0	0	1661	0	1752	1845	1568	1752	1845	1568
Flt Permitted		0.950			0.980		0.950			0.950		
Satd. Flow (perm)	0	1752	0	0	1661	0	1752	1845	1568	1752	1845	1568
Link Speed (mph)		30			30			55			55	
Link Distance (ft)		485			401			1152			444	
Travel Time (s)		11.0			9.1			14.3			5.5	
Peak Hour Factor	0.88	1.00	1.00	0.75	1.00	0.67	0.65	0.89	0.91	0.63	0.81	0.38
Adj. Flow (vph)	8	0	0	24	0	36	20	406	32	24	375	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	8	0	0	60	0	20	406	32	24	375	8
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	29.0%						ICU Level of Service A					
Analysis Period (min)	15											

# Lanes, Volumes, Timings

104: Lake Elmo Ave N/ CSAH 17 & 43rd St N

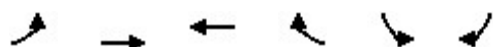
11/08/2023

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	12	41	39	361	296	6
Future Volume (vph)	12	41	39	361	296	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0			300
Storage Lanes	1	0	1			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.897					0.850
Flt Protected	0.988		0.950			
Satd. Flow (prot)	1635	0	1752	1845	1845	1568
Flt Permitted	0.988		0.950			
Satd. Flow (perm)	1635	0	1752	1845	1845	1568
Link Speed (mph)	55			55	55	
Link Distance (ft)	833			740	1462	
Travel Time (s)	10.3			9.2	18.1	
Peak Hour Factor	0.75	0.79	0.65	0.90	0.85	0.75
Adj. Flow (vph)	16	52	60	401	348	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	68	0	60	401	348	8
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	32.2%			ICU Level of Service A		
Analysis Period (min)	15					

# Lanes, Volumes, Timings

101: Stillwater Blvd / CSAH 14 & Lake Elmo Ave N/ CSAH 17

11/08/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4	Ø8
Detector Phase	2	2	6	6	7	3		
Switch Phase								
Minimum Initial (s)	15.0	15.0	15.0	15.0	7.0	7.0	1.0	1.0
Minimum Split (s)	24.0	24.0	45.0	45.0	35.0	35.0	35.0	29.0
Total Split (s)	66.0	66.0	66.0	66.0	35.0	65.0	35.0	29.0
Total Split (%)	39.8%	39.8%	39.8%	39.8%	21.1%	39.2%	21%	17%
Maximum Green (s)	60.0	60.0	60.0	60.0	30.0	60.0	30.0	24.0
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0		
Lead/Lag					Lead	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Vehicle Extension (s)	4.3	4.3	4.3	4.3	3.0	3.0	3.0	3.0
Recall Mode	Min	Min	Min	Min	None	None	None	None
Walk Time (s)			7.0	7.0			7.0	7.0
Flash Dont Walk (s)			32.0	32.0			23.0	17.0
Pedestrian Calls (#/hr)			0	0			0	0
Act Effect Green (s)	28.6	28.6	28.6	28.6	14.8	14.8		
Actuated g/C Ratio	0.52	0.52	0.52	0.52	0.27	0.27		
v/c Ratio	0.30	0.60	0.34	0.14	0.43	0.24		
Control Delay	9.6	12.5	9.0	2.1	21.6	5.8		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	9.6	12.5	9.0	2.1	21.6	5.8		
LOS	A	B	A	A	C	A		
Approach Delay		11.8	7.1		15.6			
Approach LOS		B	A		B			

## Intersection Summary

Area Type: Other

Cycle Length: 166

Actuated Cycle Length: 54.8

Natural Cycle: 115

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 11.2

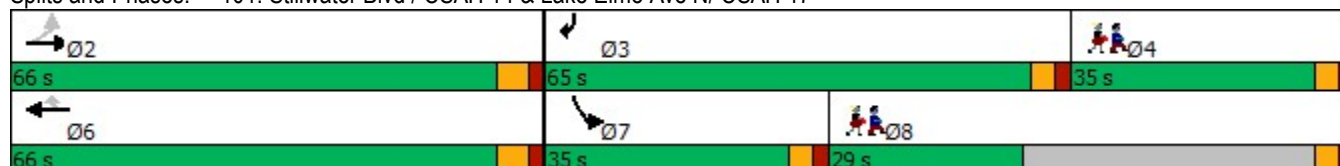
Intersection LOS: B

Intersection Capacity Utilization 53.0%

ICU Level of Service A

Analysis Period (min) 15

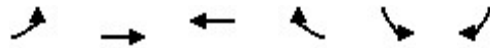
Splits and Phases: 101: Stillwater Blvd / CSAH 14 & Lake Elmo Ave N/ CSAH 17



# Phasings

101: Stillwater Blvd / CSAH 14 & Lake Elmo Ave N/ CSAH 17

11/08/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4	Ø8
Protected Phases		2	6		7	3	4	8
Permitted Phases	2			6				
Minimum Initial (s)	15.0	15.0	15.0	15.0	7.0	7.0	1.0	1.0
Minimum Split (s)	24.0	24.0	45.0	45.0	35.0	35.0	35.0	29.0
Total Split (s)	66.0	66.0	66.0	66.0	35.0	65.0	35.0	29.0
Total Split (%)	39.8%	39.8%	39.8%	39.8%	21.1%	39.2%	21%	17%
Maximum Green (s)	60.0	60.0	60.0	60.0	30.0	60.0	30.0	24.0
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag					Lead	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Vehicle Extension (s)	4.3	4.3	4.3	4.3	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	Min	Min	Min	Min	None	None	None	None
Walk Time (s)			7.0	7.0			7.0	7.0
Flash Dont Walk (s)			32.0	32.0			23.0	17.0
Pedestrian Calls (#/hr)			0	0			0	0
90th %ile Green (s)	39.9	39.9	39.9	39.9	20.0	20.0	0.0	0.0
90th %ile Term Code	Gap	Gap	Hold	Hold	Gap	Hold	Skip	Skip
70th %ile Green (s)	33.5	33.5	33.5	33.5	17.1	17.1	0.0	0.0
70th %ile Term Code	Gap	Gap	Hold	Hold	Gap	Hold	Skip	Skip
50th %ile Green (s)	28.8	28.8	28.8	28.8	15.2	15.2	0.0	0.0
50th %ile Term Code	Gap	Gap	Hold	Hold	Gap	Hold	Skip	Skip
30th %ile Green (s)	23.9	23.9	23.9	23.9	12.6	12.6	0.0	0.0
30th %ile Term Code	Gap	Gap	Hold	Hold	Gap	Hold	Skip	Skip
10th %ile Green (s)	18.5	18.5	18.5	18.5	9.6	9.6	0.0	0.0
10th %ile Term Code	Gap	Gap	Hold	Hold	Gap	Hold	Skip	Skip

## Intersection Summary

Cycle Length: 166

Actuated Cycle Length: 54.8

Control Type: Actuated-Uncoordinated

90th %ile Actuated Cycle: 70.9

70th %ile Actuated Cycle: 61.6






















50th %ile Actuated Cycle: 55

30th %ile Actuated Cycle: 47.5

10th %ile Actuated Cycle: 39.1

Lanes, Volumes, Timings  
102: Lake Elmo Ave N/ CSAH 17 & 39th St N





















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Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	18	2	59	44	336	15	30	269	40
Future Volume (vph)	0	0	0	18	2	59	44	336	15	30	269	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		175	0		0	340		195	320		295
Storage Lanes	0		1	0		0	1		1	1		1
Taper Length (ft)	25			25			200			170		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.904				0.850			0.850
Flt Protected					0.988		0.950			0.950		
Satd. Flow (prot)	0	1845	1845	0	1648	0	1752	1845	1568	1752	1845	1568
Flt Permitted					0.988		0.950			0.950		
Satd. Flow (perm)	0	1845	1845	0	1648	0	1752	1845	1568	1752	1845	1568
Link Speed (mph)		30			30			55			55	
Link Distance (ft)		577			559			794			1152	
Travel Time (s)		13.1			12.7			9.8			14.3	
Peak Hour Factor	1.00	1.00	1.00	0.75	0.50	0.87	0.69	0.88	0.63	0.75	0.86	0.83
Adj. Flow (vph)	0	0	0	24	4	68	64	382	24	40	313	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	96	0	64	382	24	40	313	48
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	35.8%						ICU Level of Service A					
Analysis Period (min)	15											

# Lanes, Volumes, Timings

103: Lake Elmo Ave N/ CSAH 17/CSAH 17 & 41st St N

11/08/2023





												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	0	0	18	0	24	13	361	29	15	304	3
Future Volume (vph)	7	0	0	18	0	24	13	361	29	15	304	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	250		250	245		235
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (ft)	25			25			135			140		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.919				0.850			0.850
Flt Protected		0.950			0.980		0.950			0.950		
Satd. Flow (prot)	0	1752	0	0	1661	0	1752	1845	1568	1752	1845	1568
Flt Permitted		0.950			0.980		0.950			0.950		
Satd. Flow (perm)	0	1752	0	0	1661	0	1752	1845	1568	1752	1845	1568
Link Speed (mph)		30			30			55			55	
Link Distance (ft)		485			401			1152			444	
Travel Time (s)		11.0			9.1			14.3			5.5	
Peak Hour Factor	0.88	1.00	1.00	0.75	1.00	0.67	0.65	0.89	0.91	0.63	0.81	0.38
Adj. Flow (vph)	8	0	0	24	0	36	20	406	32	24	375	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	8	0	0	60	0	20	406	32	24	375	8
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	29.0%						ICU Level of Service A					
Analysis Period (min)	15											



Lanes, Volumes, Timings  
104: Lake Elmo Ave N/ CSAH 17 & 43rd St N












11/08/2023



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	12	41	39	361	296	6
Future Volume (vph)	12	41	39	361	296	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0			300
Storage Lanes	1	0	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.897					0.850
Flt Protected	0.988			0.994		
Satd. Flow (prot)	1635	0	0	1834	1845	1568
Flt Permitted	0.988			0.994		
Satd. Flow (perm)	1635	0	0	1834	1845	1568
Link Speed (mph)	55			55	55	
Link Distance (ft)	833			740	1462	
Travel Time (s)	10.3			9.2	18.1	
Peak Hour Factor	0.75	0.79	0.65	0.90	0.85	0.75
Adj. Flow (vph)	16	52	60	401	348	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	68	0	0	461	348	8
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	50.1%			ICU Level of Service A		
Analysis Period (min)	15					

Lanes, Volumes, Timings  
5101: Stillwater Blvd / CSAH 14

11/08/2023

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				 		
Traffic Volume (vph)	688	1	2	421	1	3
Future Volume (vph)	688	1	2	421	1	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt	0.999					0.850
Flt Protected					0.950	
Satd. Flow (prot)	1843	0	0	3505	1752	1568
Flt Permitted					0.950	
Satd. Flow (perm)	1843	0	0	3505	1752	1568
Link Speed (mph)	55			40	30	
Link Distance (ft)	204			188	352	
Travel Time (s)	2.5			3.2	8.0	
Peak Hour Factor	0.91	0.25	0.50	0.95	0.25	0.38
Adj. Flow (vph)	756	4	4	443	4	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	760	0	0	447	4	8
Enter Blocked Intersection	Yes	Yes	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane				Yes		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	46.3%			ICU Level of Service A		
Analysis Period (min)	15					

# SimTraffic Simulation Summary

## Existing Conditions

11/08/2023

### Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	3:45	3:45	3:45	3:45	3:45	3:45
End Time	5:00	5:00	5:00	5:00	5:00	5:00
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4
Volume counts from "S:\2023\230170 - 2024 Washington County Regional Solicitation Applications\TRAFFIC ANALYSIS\SYNCHRO\CSV\100_PM_2023.0						
Volume date = 11/06/2023						
Vehs Entered	1737	1773	1813	1751	1799	1775
Vehs Exited	1727	1762	1801	1760	1797	1772
Starting Vehs	38	34	26	43	34	34
Ending Vehs	48	45	38	34	36	34
Denied Entry Before	1	0	0	2	0	1
Denied Entry After	1	1	0	0	0	0
Travel Distance (mi)	1102	1106	1100	1099	1112	1104
Travel Time (hr)	38.9	39.8	38.9	39.4	39.3	39.2
Total Delay (hr)	6.8	7.4	6.7	7.1	6.8	7.0
Total Stops	885	916	849	904	882	890
Fuel Used (gal)	39.0	39.4	38.8	38.8	39.6	39.1

### Interval #0 Information Seeding

Start Time	3:45
End Time	4:00
Total Time (min)	15
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

### Interval #1 Information Recording

Start Time	4:00					
End Time	4:15					
Total Time (min)	15					
Volumes adjusted by Growth Factors.						
Run Number	1	2	3	4	5	Avg
Vehs Entered	444	488	453	460	470	465
Vehs Exited	455	466	434	458	465	456
Starting Vehs	38	34	26	43	34	34
Ending Vehs	27	56	45	45	39	39
Denied Entry Before	1	0	0	2	0	1
Denied Entry After	0	0	0	0	0	0
Travel Distance (mi)	276	318	265	288	293	288
Travel Time (hr)	9.9	11.3	9.3	10.5	10.4	10.3
Total Delay (hr)	1.8	2.2	1.5	2.0	1.9	1.9
Total Stops	207	244	192	239	225	225
Fuel Used (gal)	9.8	11.4	9.4	10.2	10.2	10.2

# SimTraffic Simulation Summary

## Existing Conditions

11/08/2023

### Interval #2 Information Recording

Start Time 4:15  
End Time 4:30  
Total Time (min) 15

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	458	430	422	423	438	433
Vehs Exited	439	445	422	423	438	432
Starting Vehs	27	56	45	45	39	39
Ending Vehs	46	41	45	45	39	41
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0
Travel Distance (mi)	293	269	268	273	272	275
Travel Time (hr)	10.4	9.7	9.5	9.7	9.5	9.8
Total Delay (hr)	1.9	1.8	1.8	1.8	1.6	1.8
Total Stops	243	236	220	223	216	228
Fuel Used (gal)	10.4	9.6	9.5	9.6	9.7	9.7

### Interval #3 Information Recording

Start Time 4:30  
End Time 4:45  
Total Time (min) 15

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	417	394	435	411	445	420
Vehs Exited	426	403	447	420	445	429
Starting Vehs	46	41	45	45	39	41
Ending Vehs	37	32	33	36	39	34
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0
Travel Distance (mi)	259	229	271	245	274	256
Travel Time (hr)	9.1	8.1	9.5	8.6	9.6	9.0
Total Delay (hr)	1.5	1.4	1.6	1.4	1.6	1.5
Total Stops	222	194	199	195	208	205
Fuel Used (gal)	9.3	8.1	9.5	8.7	9.8	9.1

# SimTraffic Simulation Summary

## Existing Conditions

11/08/2023

### Interval #4 Information Recording

Start Time 4:45  
End Time 5:00  
Total Time (min) 15

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	418	461	503	457	446	457
Vehs Exited	407	448	498	459	449	453
Starting Vehs	37	32	33	36	39	34
Ending Vehs	48	45	38	34	36	34
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	1	1	0	0	0	0
Travel Distance (mi)	274	291	296	292	273	285
Travel Time (hr)	9.5	10.7	10.5	10.5	9.8	10.2
Total Delay (hr)	1.5	2.1	1.8	1.9	1.8	1.8
Total Stops	213	242	238	247	233	233
Fuel Used (gal)	9.6	10.2	10.5	10.3	9.8	10.1

101: Stillwater Blvd / CSAH 14 & Lake Elmo Ave N/ CSAH 17 Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Total Delay (hr)	0.6	1.1	0.4	0.0	1.2	0.0	0.7	4.0
Total Del/Veh (s)	16.3	7.2	4.6	1.5	22.8	0.6	21.1	10.3
Stop Delay (hr)	0.5	0.5	0.2	0.0	1.0	0.0	0.7	3.0
Stop Del/Veh (s)	13.6	3.2	2.8	1.2	19.8	0.0	20.4	7.6
Total Stops	112	166	85	39	147	0	96	645
Stop/Veh	0.81	0.32	0.27	0.37	0.79	0.00	0.82	0.46
Travel Dist (mi)	9.5	35.9	9.5	3.2	31.2	1.0	19.9	110.3
Travel Time (hr)	1.0	2.0	0.6	0.2	2.1	0.0	1.4	7.4
Avg Speed (mph)	10	18	15	14	15	37	15	15
Fuel Used (gal)	0.4	1.5	0.4	0.1	1.4	0.1	1.0	4.8
Fuel Eff. (mpg)	24.8	23.2	26.8	50.8	21.7	16.5	20.8	23.0
HC Emissions (g)	3	25	5	0	23	2	17	74
CO Emissions (g)	123	1068	161	11	1213	86	875	3537
NOx Emissions (g)	10	73	14	1	61	5	45	208
Vehicles Entered	138	525	314	106	185	11	116	1395
Vehicles Exited	138	524	313	106	184	12	116	1393
Hourly Exit Rate	138	524	313	106	184	12	116	1393
Input Volume	142	511	315	109	178	7	112	1374
% of Volume	97	103	99	97	103	171	104	101
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0
Density (ft/veh)								371
Occupancy (veh)	1	2	1	0	2	0	1	7

102: Lake Elmo Ave N/ CSAH 17 & 39th St N Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.1	0.1	1.6	0.1	1.2	0.1	0.0	0.2	0.2
Total Delay (hr)	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.2	0.0	0.5
Total Del/Veh (s)	11.6	7.7	4.2	2.8	1.2	0.2	2.1	2.3	0.3	2.1
Stop Delay (hr)	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Stop Del/Veh (s)	9.4	3.8	3.9	1.4	0.0	0.0	1.1	0.0	0.0	0.6
Total Stops	18	2	53	16	0	0	11	0	0	100
Stop/Veh	1.00	1.00	1.00	0.37	0.00	0.00	0.38	0.00	0.00	0.12
Travel Dist (mi)	1.8	0.2	5.2	5.0	40.4	1.7	6.2	59.9	8.9	129.3
Travel Time (hr)	0.1	0.0	0.3	0.2	1.0	0.1	0.2	1.3	0.2	3.4
Avg Speed (mph)	14	18	18	26	40	32	37	45	42	38
Fuel Used (gal)	0.1	0.0	0.2	0.2	2.6	0.1	0.2	1.6	0.3	5.2
Fuel Eff. (mpg)	31.8	30.8	34.6	22.7	15.5	21.6	32.3	36.9	32.9	24.9
HC Emissions (g)	0	0	1	3	46	2	2	34	7	97
CO Emissions (g)	14	2	38	220	2974	101	141	1505	298	5293
NOx Emissions (g)	1	0	3	10	140	6	8	101	20	289
Vehicles Entered	18	2	53	43	337	14	29	281	42	819
Vehicles Exited	18	2	52	43	337	14	29	283	42	820
Hourly Exit Rate	18	2	52	43	337	14	29	283	42	820
Input Volume	18	2	59	44	336	15	30	270	40	814
% of Volume	100	100	88	98	100	93	97	105	105	101
Denied Entry Before	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0
Density (ft/veh)										2114
Occupancy (veh)	0	0	0	0	1	0	0	1	0	3

103: Lake Elmo Ave N/ CSAH 17/CSAH 17 & 41st St N Performance by movement

Movement	EBL	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.1	0.1	0.3	0.0	0.2	0.0	0.0	0.0	0.0
Total Delay (hr)	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.4
Total Del/Veh (s)	10.9	9.2	4.1	2.1	2.7	0.5	3.3	0.3	0.1	1.9
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Stop Del/Veh (s)	9.3	7.5	4.3	0.8	0.1	0.1	1.9	0.0	0.0	0.4
Total Stops	6	19	25	4	0	0	5	0	0	59
Stop/Veh	1.00	1.00	1.00	0.29	0.00	0.00	0.42	0.00	0.00	0.07
Travel Dist (mi)	0.5	1.3	1.7	3.0	75.9	6.7	1.0	27.5	0.3	118.0
Travel Time (hr)	0.0	0.1	0.1	0.1	1.8	0.2	0.0	0.7	0.0	3.1
Avg Speed (mph)	14	13	16	36	43	39	21	37	25	38
Fuel Used (gal)	0.0	0.0	0.0	0.1	2.1	0.2	0.0	2.1	0.0	4.7
Fuel Eff. (mpg)	36.8	37.9	38.1	35.6	35.7	34.0	28.4	13.0	28.4	25.4
HC Emissions (g)	0	0	0	1	38	3	1	44	0	87
CO Emissions (g)	2	7	7	53	1728	159	36	2658	9	4657
NOx Emissions (g)	0	1	1	3	118	9	2	126	0	260
Vehicles Entered	6	19	25	14	360	31	12	333	3	803
Vehicles Exited	6	19	25	14	361	32	12	334	3	806
Hourly Exit Rate	6	19	25	14	361	32	12	334	3	806
Input Volume	7	18	24	13	370	29	15	319	3	798
% of Volume	86	106	104	108	98	110	80	105	100	101
Denied Entry Before	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0
Density (ft/veh)										1742
Occupancy (veh)	0	0	0	0	2	0	0	1	0	3



104: Lake Elmo Ave N/ CSAH 17 & 43rd St N Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.2	0.1	0.0	0.0	0.3	3.3	0.1
Total Delay (hr)	0.0	0.0	0.0	0.2	0.2	0.0	0.6
Total Del/Veh (s)	8.4	3.2	3.3	2.4	2.7	0.3	2.7
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Stop Del/Veh (s)	7.4	3.1	2.0	0.1	0.0	0.0	0.4
Total Stops	11	43	17	5	0	0	76
Stop/Veh	1.00	1.00	0.42	0.01	0.00	0.00	0.10
Travel Dist (mi)	1.6	6.5	5.6	48.3	82.7	1.4	146.1
Travel Time (hr)	0.1	0.2	0.2	1.4	1.8	0.0	3.7
Avg Speed (mph)	24	30	27	36	47	45	40
Fuel Used (gal)	0.0	0.2	0.2	2.1	2.0	0.0	4.6
Fuel Eff. (mpg)	34.4	33.7	23.1	23.0	41.2	39.4	31.6
HC Emissions (g)	0	4	4	38	43	0	89
CO Emissions (g)	29	172	238	2229	1542	19	4229
NOx Emissions (g)	1	11	11	105	141	1	271
Vehicles Entered	11	43	40	346	305	5	750
Vehicles Exited	11	43	40	345	305	5	749
Hourly Exit Rate	11	43	40	345	305	5	749
Input Volume	12	41	39	361	296	6	755
% of Volume	92	105	103	96	103	83	99
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)	1210						
Occupancy (veh)	0	0	0	1	2	0	4

5101: Stillwater Blvd / CSAH 14 Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Delay (hr)	0.4	0.0	0.0	0.1	0.0	0.0	0.5
Total Del/Veh (s)	2.1	0.8	5.8	1.0	10.6	6.2	1.7
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.1	0.0	3.9	0.1	9.5	6.7	0.1
Total Stops	0	0	1	4	2	3	10
Stop/Veh	0.00	0.00	1.00	0.01	1.00	1.00	0.01
Travel Dist (mi)	24.3	0.0	0.0	14.7	0.1	0.2	39.4
Travel Time (hr)	1.1	0.0	0.0	0.5	0.0	0.0	1.6
Avg Speed (mph)	22	16	13	30	10	13	24
Fuel Used (gal)	1.4	0.0	0.0	0.3	0.0	0.0	1.7
Fuel Eff. (mpg)	17.0	25.4	40.5	54.3	34.7	41.4	23.0
HC Emissions (g)	22	0	0	4	0	0	26
CO Emissions (g)	719	0	0	121	0	0	841
NOx Emissions (g)	84	0	0	12	0	0	96
Vehicles Entered	707	1	1	417	2	3	1131
Vehicles Exited	706	1	1	417	2	3	1130
Hourly Exit Rate	706	1	1	417	2	3	1130
Input Volume	688	1	2	421	1	3	1116
% of Volume	103	100	50	99	200	100	101
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)							721
Occupancy (veh)	1	0	0	0	0	0	2

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Total Network Performance

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Denied Delay (hr)	0.2
Denied Del/Veh (s)	0.5
Total Delay (hr)	6.7
Total Del/Veh (s)	13.4
Stop Delay (hr)	3.4
Stop Del/Veh (s)	6.8
Total Stops	890
Stop/Veh	0.49
Travel Dist (mi)	1103.6
Travel Time (hr)	39.2
Avg Speed (mph)	28
Fuel Used (gal)	39.1
Fuel Eff. (mpg)	28.2
HC Emissions (g)	618
CO Emissions (g)	24696
NOx Emissions (g)	1848
Vehicles Entered	1775
Vehicles Exited	1772
Hourly Exit Rate	1772
Input Volume	10044
% of Volume	18
Denied Entry Before	1
Denied Entry After	0
Density (ft/veh)	646
Occupancy (veh)	39

Queuing and Blocking Report  
Existing Conditions

11/08/2023

Intersection: 101: Stillwater Blvd / CSAH 14 & Lake Elmo Ave N/ CSAH 17

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	136	222	103	60	178	99
Average Queue (ft)	56	93	55	24	69	35
95th Queue (ft)	104	165	97	52	132	78
Link Distance (ft)		306	86	86	841	
Upstream Blk Time (%)		0	2	0		
Queuing Penalty (veh)		0	3	0		
Storage Bay Dist (ft)	240					305
Storage Blk Time (%)		0				
Queuing Penalty (veh)		0				

Intersection: 102: Lake Elmo Ave N/ CSAH 17 & 39th St N

Movement	WB	NB	SB
Directions Served	LTR	L	L
Maximum Queue (ft)	61	36	37
Average Queue (ft)	24	11	8
95th Queue (ft)	45	31	28
Link Distance (ft)	511		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		340	320
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 103: Lake Elmo Ave N/ CSAH 17/CSAH 17 & 41st St N

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	L	L
Maximum Queue (ft)	26	45	28	36
Average Queue (ft)	4	20	3	5
95th Queue (ft)	19	36	16	24
Link Distance (ft)	438	353		
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			250	245
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report  
Existing Conditions

11/08/2023

Intersection: 104: Lake Elmo Ave N/ CSAH 17 & 43rd St N

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	36	82
Average Queue (ft)	16	17
95th Queue (ft)	31	56
Link Distance (ft)	792	689
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5101: Stillwater Blvd / CSAH 14

Movement	WB	NB	NB
Directions Served	LT	L	R
Maximum Queue (ft)	74	19	18
Average Queue (ft)	4	1	1
95th Queue (ft)	32	10	9
Link Distance (ft)	132	307	307
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 3
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Actuated Signals, Observed Splits  
Existing Conditions

11/08/2023

Intersection: 101: Stillwater Blvd / CSAH 14 & Lake Elmo Ave N/ CSAH 17

Phase	2	3	4	6	7	8
Movement(s) Served	EBTL	SBR	Ped	WBT	SBL	Ped
Maximum Green (s)	60.0	60.0	30.0	60.0	30.0	24.0
Minimum Green (s)	15.0	7.0	1.0	15.0	7.0	1.0
Recall	Min	None	None	Min	None	None
Avg. Green (s)	32.2	11.9	10.6	32.2	12.0	9.1
g/C Ratio	NA	-0.01	-0.01	NA	-0.01	-0.01
Cycles Skipped (%)	0	22	76	0	13	87
Cycles @ Minimum (%)	3	11	0	3	13	0
Cycles Maxed Out (%)	6	0	0	6	0	0
Cycles with Peds (%)	0	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0

# SimTraffic Simulation Summary

## Proposed Conditions

11/08/2023

### Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	3:45	3:45	3:45	3:45	3:45	3:45
End Time	5:00	5:00	5:00	5:00	5:00	5:00
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4
Volume counts from "S:\2023\230170 - 2024 Washington County Regional Solicitation Applications\TRAFFIC ANALYSIS\SYNCHRO\CSV\100_PM_2023_						
Volume date = 11/06/2023						
Vehs Entered	1785	1830	1722	1707	1795	1767
Vehs Exited	1773	1836	1732	1686	1794	1763
Starting Vehs	24	42	41	22	32	31
Ending Vehs	36	36	31	43	33	34
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0
Travel Distance (mi)	1126	1184	1097	1074	1131	1122
Travel Time (hr)	39.8	41.5	37.0	36.6	39.0	38.8
Total Delay (hr)	6.3	6.5	4.5	4.7	5.6	5.5
Total Stops	751	780	496	533	652	642
Fuel Used (gal)	40.1	42.1	38.8	37.9	40.1	39.8

### Interval #0 Information Seeding

Start Time	3:45
End Time	4:00
Total Time (min)	15
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

### Interval #1 Information Recording

Start Time	4:00					
End Time	4:15					
Total Time (min)	15					
Volumes adjusted by Growth Factors.						
Run Number	1	2	3	4	5	Avg
Vehs Entered	443	488	456	458	470	465
Vehs Exited	437	477	451	438	464	451
Starting Vehs	24	42	41	22	32	31
Ending Vehs	30	53	46	42	38	40
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0
Travel Distance (mi)	274	322	280	285	290	290
Travel Time (hr)	10.0	11.4	9.6	9.8	9.8	10.1
Total Delay (hr)	1.9	1.9	1.2	1.3	1.2	1.5
Total Stops	221	252	133	156	132	181
Fuel Used (gal)	9.9	11.6	9.8	10.0	10.1	10.3

# SimTraffic Simulation Summary

## Proposed Conditions

11/08/2023

### Interval #2 Information Recording

Start Time 4:15  
End Time 4:30  
Total Time (min) 15

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	458	439	413	401	490	439
Vehs Exited	459	451	431	403	475	445
Starting Vehs	30	53	46	42	38	40
Ending Vehs	29	41	28	40	53	35
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	1	1	0
Travel Distance (mi)	294	280	272	245	313	281
Travel Time (hr)	10.7	10.0	9.3	8.3	10.9	9.8
Total Delay (hr)	1.9	1.7	1.2	1.0	1.7	1.5
Total Stops	237	192	165	115	204	181
Fuel Used (gal)	10.4	9.9	9.7	8.6	11.1	9.9

### Interval #3 Information Recording

Start Time 4:30  
End Time 4:45  
Total Time (min) 15

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	432	436	432	422	398	426
Vehs Exited	420	438	419	420	419	425
Starting Vehs	29	41	28	40	53	35
Ending Vehs	41	39	41	42	32	34
Denied Entry Before	0	0	0	1	1	0
Denied Entry After	0	0	0	0	0	0
Travel Distance (mi)	260	277	268	267	257	266
Travel Time (hr)	8.9	9.5	8.9	8.9	8.8	9.0
Total Delay (hr)	1.1	1.3	1.0	1.1	1.3	1.2
Total Stops	124	164	114	116	127	128
Fuel Used (gal)	9.1	10.0	9.4	9.5	9.2	9.4



# SimTraffic Simulation Summary

## Proposed Conditions

11/08/2023

### Interval #4 Information Recording

Start Time 4:45  
End Time 5:00  
Total Time (min) 15

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	452	467	421	426	437	440
Vehs Exited	457	470	431	425	436	445
Starting Vehs	41	39	41	42	32	34
Ending Vehs	36	36	31	43	33	34
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0
Travel Distance (mi)	297	306	278	277	272	286
Travel Time (hr)	10.2	10.5	9.3	9.5	9.5	9.8
Total Delay (hr)	1.4	1.5	1.1	1.3	1.4	1.3
Total Stops	169	172	84	146	189	151
Fuel Used (gal)	10.6	10.6	9.9	9.8	9.7	10.1

SimTraffic Performance Report  
Proposed Conditions

11/08/2023

101: Stillwater Blvd / CSAH 14 & Lake Elmo Ave N/ CSAH 17 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
Total Delay (hr)	0.3	1.6	0.0	0.0	0.4	0.1	0.0	0.0	0.2	0.0	0.1	2.8
Total Del/Veh (s)	8.2	11.2	3.7	3.5	4.9	3.0	4.0	2.9	4.6	0.6	4.2	7.3
Stop Delay (hr)	0.2	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	1.1
Stop Del/Veh (s)	4.6	4.9	0.0	1.2	0.5	0.6	1.2	0.5	1.3	0.0	0.9	2.7
Total Stops	57	210	0	0	42	17	0	0	52	0	22	400
Stop/Veh	0.40	0.41	0.00	0.00	0.14	0.15	0.00	0.00	0.29	0.00	0.18	0.29
Travel Dist (mi)	8.8	31.8	0.1	0.1	10.3	3.8	0.1	0.1	30.8	0.9	20.7	107.4
Travel Time (hr)	0.7	2.4	0.0	0.0	0.7	0.3	0.0	0.0	1.1	0.0	0.7	5.9
Avg Speed (mph)	13	13	20	14	15	15	18	18	28	37	28	18
Fuel Used (gal)	0.3	1.0	0.0	0.0	0.4	0.1	0.0	0.0	1.3	0.1	0.9	3.9
Fuel Eff. (mpg)	33.3	32.8	34.0	27.9	27.9	27.9	42.4	45.4	24.5	16.3	24.1	27.4
HC Emissions (g)	2	10	0	0	4	2	0	0	20	2	16	56
CO Emissions (g)	61	237	1	0	102	44	0	0	1182	86	868	2582
NOx Emissions (g)	8	29	0	0	15	6	0	0	57	6	45	166
Vehicles Entered	142	513	1	2	302	112	1	2	179	9	120	1383
Vehicles Exited	143	513	1	2	302	113	1	2	178	9	120	1384
Hourly Exit Rate	143	513	1	2	302	113	1	2	178	9	120	1384
Input Volume	142	511	1	2	313	109	1	3	178	7	112	1379
% of Volume	101	100	100	100	96	104	100	67	100	129	107	100
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0
Density (ft/veh)												336
Occupancy (veh)	1	2	0	0	1	0	0	0	1	0	1	6

102: Lake Elmo Ave N/ CSAH 17 & 39th St N Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.1	0.1	1.4	0.1	1.7	0.1	0.0	0.2	0.2
Total Delay (hr)	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.2	0.0	0.5
Total Del/Veh (s)	11.0	8.1	4.4	2.3	1.2	0.2	2.0	2.3	0.3	2.1
Stop Delay (hr)	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Stop Del/Veh (s)	9.0	4.9	4.2	1.1	0.0	0.0	1.1	0.0	0.0	0.6
Total Stops	19	2	58	13	0	0	10	0	0	102
Stop/Veh	1.00	1.00	1.00	0.30	0.00	0.00	0.34	0.00	0.00	0.12
Travel Dist (mi)	1.9	0.2	5.7	5.2	41.8	1.8	6.2	59.1	8.6	130.4
Travel Time (hr)	0.1	0.0	0.3	0.2	1.0	0.1	0.2	1.3	0.2	3.5
Avg Speed (mph)	14	18	18	27	40	31	37	45	42	38
Fuel Used (gal)	0.1	0.0	0.2	0.2	2.6	0.1	0.2	1.6	0.3	5.3
Fuel Eff. (mpg)	31.5	39.9	34.5	22.0	15.8	23.5	31.1	35.9	33.1	24.7
HC Emissions (g)	0	0	3	4	54	2	2	28	5	99
CO Emissions (g)	12	1	74	254	3155	99	155	1422	256	5427
NOx Emissions (g)	1	0	8	12	158	5	7	85	16	292
Vehicles Entered	19	2	58	43	346	15	29	279	41	832
Vehicles Exited	19	2	58	43	345	15	29	280	41	832
Hourly Exit Rate	19	2	58	43	345	15	29	280	41	832
Input Volume	18	2	59	44	336	15	30	270	40	814
% of Volume	106	100	98	98	103	100	97	104	102	102
Denied Entry Before	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0
Density (ft/veh)										2085
Occupancy (veh)	0	0	0	0	1	0	0	1	0	3

103: Lake Elmo Ave N/ CSAH 17/CSAH 17 & 41st St N Performance by movement

Movement	EBL	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.2	0.1	0.3	0.0	0.2	0.0	0.0	0.0	0.0
Total Delay (hr)	0.0	0.1	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.5
Total Del/Veh (s)	11.5	12.4	5.8	2.2	2.8	0.6	3.8	0.3	0.1	2.1
Stop Delay (hr)	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Stop Del/Veh (s)	10.2	10.4	5.3	1.2	0.1	0.0	2.3	0.0	0.0	0.6
Total Stops	7	20	25	5	0	0	7	0	0	64
Stop/Veh	1.00	1.00	1.00	0.33	0.00	0.00	0.47	0.00	0.00	0.08
Travel Dist (mi)	0.6	1.3	1.7	3.0	79.5	6.0	1.3	26.9	0.3	120.6
Travel Time (hr)	0.0	0.1	0.1	0.1	1.9	0.2	0.1	0.7	0.0	3.2
Avg Speed (mph)	13	11	15	35	43	39	21	37	25	38
Fuel Used (gal)	0.0	0.0	0.1	0.1	2.3	0.2	0.0	2.1	0.0	4.8
Fuel Eff. (mpg)	34.8	31.3	33.5	31.8	34.6	35.1	26.8	12.9	25.9	25.0
HC Emissions (g)	0	0	0	1	49	4	1	43	0	99
CO Emissions (g)	2	7	11	73	2051	158	37	2603	8	4949
NOx Emissions (g)	0	1	1	5	149	12	2	121	0	291
Vehicles Entered	7	20	25	15	375	28	15	327	3	815
Vehicles Exited	7	20	25	15	374	28	15	326	3	813
Hourly Exit Rate	7	20	25	15	374	28	15	326	3	813
Input Volume	7	18	24	13	370	29	15	319	3	798
% of Volume	100	111	104	115	101	97	100	102	100	102
Denied Entry Before	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0
Density (ft/veh)										1680
Occupancy (veh)	0	0	0	0	2	0	0	1	0	3

104: Lake Elmo Ave N/ CSAH 17 & 43rd St N Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.2	0.1	0.0	0.0	0.3	3.9	0.1
Total Delay (hr)	0.0	0.0	0.0	0.2	0.2	0.0	0.5
Total Del/Veh (s)	11.5	3.2	2.9	1.8	2.7	0.3	2.4
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Stop Del/Veh (s)	10.4	3.2	2.1	0.0	0.0	0.0	0.4
Total Stops	13	42	15	0	0	0	70
Stop/Veh	1.00	1.00	0.45	0.00	0.00	0.00	0.09
Travel Dist (mi)	2.0	6.4	4.7	51.4	82.5	1.7	148.6
Travel Time (hr)	0.1	0.2	0.2	1.4	1.8	0.0	3.7
Avg Speed (mph)	21	30	27	37	47	46	41
Fuel Used (gal)	0.1	0.2	0.2	2.2	2.0	0.0	4.8
Fuel Eff. (mpg)	30.8	32.8	20.6	23.1	41.2	36.1	31.2
HC Emissions (g)	1	3	4	48	39	0	95
CO Emissions (g)	38	163	249	2572	1459	29	4509
NOx Emissions (g)	2	9	11	129	131	2	283
Vehicles Entered	13	42	33	369	305	6	768
Vehicles Exited	13	42	33	367	304	6	765
Hourly Exit Rate	13	42	33	367	304	6	765
Input Volume	12	41	39	361	296	6	755
% of Volume	108	102	85	102	103	100	101
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)							1413
Occupancy (veh)	0	0	0	1	2	0	4

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Total Network Performance

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Denied Delay (hr)	0.2
Denied Del/Veh (s)	0.5
Total Delay (hr)	5.3
Total Del/Veh (s)	10.6
Stop Delay (hr)	1.5
Stop Del/Veh (s)	3.1
Total Stops	642
Stop/Veh	0.36
Travel Dist (mi)	1122.5
Travel Time (hr)	38.8
Avg Speed (mph)	29
Fuel Used (gal)	39.8
Fuel Eff. (mpg)	28.2
HC Emissions (g)	647
CO Emissions (g)	25852
NOx Emissions (g)	1918
Vehicles Entered	1767
Vehicles Exited	1763
Hourly Exit Rate	1763
Input Volume	10055
% of Volume	18
Denied Entry Before	0
Denied Entry After	0
Density (ft/veh)	648
Occupancy (veh)	39

# Queuing and Blocking Report

## Proposed Conditions

11/08/2023

### Intersection: 101: Stillwater Blvd / CSAH 14 & Lake Elmo Ave N/ CSAH 17

Movement	EB	WB	NB	SB
Directions Served	LT	LTR	LTR	LTR
Maximum Queue (ft)	238	84	15	103
Average Queue (ft)	87	31	1	36
95th Queue (ft)	197	74	6	77
Link Distance (ft)	269	126	269	871
Upstream Blk Time (%)	1	0		
Queuing Penalty (veh)	0	0		
Storage Bay Dist (ft)				
Storage Blk Time (%)	5			
Queuing Penalty (veh)	0			

### Intersection: 102: Lake Elmo Ave N/ CSAH 17 & 39th St N

Movement	WB	NB	SB
Directions Served	LTR	L	L
Maximum Queue (ft)	72	47	28
Average Queue (ft)	26	8	8
95th Queue (ft)	49	29	27
Link Distance (ft)	511		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		340	320
Storage Blk Time (%)			
Queuing Penalty (veh)			

### Intersection: 103: Lake Elmo Ave N/ CSAH 17/CSAH 17 & 41st St N

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	L	L
Maximum Queue (ft)	31	60	28	41
Average Queue (ft)	4	27	4	6
95th Queue (ft)	20	51	20	29
Link Distance (ft)	438	354		
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			250	245
Storage Blk Time (%)				
Queuing Penalty (veh)				

## Queuing and Blocking Report

### Proposed Conditions

11/08/2023

Intersection: 104: Lake Elmo Ave N/ CSAH 17 & 43rd St N

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	48	46
Average Queue (ft)	16	10
95th Queue (ft)	32	34
Link Distance (ft)	786	689
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

### Network Summary

Network wide Queuing Penalty: 0

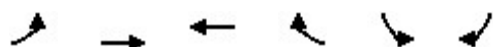




# Lanes, Volumes, Timings

101: Stillwater Blvd / CSAH 14 & Lake Elmo Ave N/ CSAH 17

11/08/2023



















Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4	Ø8
Lane Configurations								
Traffic Volume (vph)	142	511	313	109	178	112		
Future Volume (vph)	142	511	313	109	178	112		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Storage Length (ft)	240			0	0	305		
Storage Lanes	1			1	1	1		
Taper Length (ft)	50				25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Frt				0.850		0.850		
Flt Protected	0.950				0.950			
Satd. Flow (prot)	1752	1845	1845	1568	1752	1568		
Flt Permitted	0.562				0.950			
Satd. Flow (perm)	1037	1845	1845	1568	1752	1568		
Right Turn on Red				Yes		Yes		
Satd. Flow (RTOR)				124		124		
Link Speed (mph)		55	40		55			
Link Distance (ft)		359	204		953			
Travel Time (s)		4.5	3.5		11.8			
Peak Hour Factor	0.87	0.88	0.95	0.88	0.87	0.90		
Adj. Flow (vph)	163	581	329	124	205	124		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	163	581	329	124	205	124		
Enter Blocked Intersection	No	No	Yes	Yes	No	No		
Lane Alignment	Left	Left	Left	Right	Left	Right		
Median Width(ft)		12	20		12			
Link Offset(ft)		0	0		0			
Crosswalk Width(ft)		16	16		16			
Two way Left Turn Lane								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00		
Turning Speed (mph)	15			9	15	9		
Number of Detectors	1	2	2	1	1	1		
Detector Template	Left	Thru	Thru	Right	Left	Right		
Leading Detector (ft)	20	100	100	20	20	20		
Trailing Detector (ft)	0	0	0	0	0	0		
Detector 1 Position(ft)	0	0	0	0	0	0		
Detector 1 Size(ft)	20	6	6	20	20	20		
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		
Detector 1 Channel								
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0		
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0		
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0		
Detector 2 Position(ft)		94	94					
Detector 2 Size(ft)		6	6					
Detector 2 Type		Cl+Ex	Cl+Ex					
Detector 2 Channel								
Detector 2 Extend (s)		0.0	0.0					
Turn Type	Perm	NA	NA	Perm	Prot	Prot		
Protected Phases		2	6		7	3	4	8
Permitted Phases	2			6				

# Lanes, Volumes, Timings






















101: Stillwater Blvd / CSAH 14 & Lake Elmo Ave N/ CSAH 17

11/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	142	511	1	2	313	109	1	0	3	178	0	112
Future Volume (vph)	142	511	1	2	313	109	1	0	3	178	0	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	240		0	0		0	0		0	0		305
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	50			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.963			0.899			0.949	
Flt Protected		0.989						0.988			0.970	
Satd. Flow (prot)	0	1824	0	0	1776	0	0	1638	0	0	1698	0
Flt Permitted		0.989						0.988			0.970	
Satd. Flow (perm)	0	1824	0	0	1776	0	0	1638	0	0	1698	0
Link Speed (mph)		55			40			30			55	
Link Distance (ft)		359			204			332			953	
Travel Time (s)		4.5			3.5			7.5			11.8	
Peak Hour Factor	0.87	0.88	0.92	0.92	0.95	0.88	0.92	0.92	0.92	0.87	0.92	0.90
Adj. Flow (vph)	163	581	1	2	329	124	1	0	3	205	0	124
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	745	0	0	455	0	0	4	0	0	329	0
Enter Blocked Intersection	No	No	No	No	Yes	Yes	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			20			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Yield			Yield			Yield			Yield	
Intersection Summary												
Area Type:	Other											
Control Type:	Roundabout											
Intersection Capacity Utilization	91.4%						ICU Level of Service F					
Analysis Period (min)	15											

Lanes, Volumes, Timings  
102: Lake Elmo Ave N/ CSAH 17 & 39th St N





















11/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	18	2	59	44	336	15	30	269	40
Future Volume (vph)	0	0	0	18	2	59	44	336	15	30	269	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		175	0		0	340		195	320		295
Storage Lanes	0		1	0		0	1		1	1		1
Taper Length (ft)	25			25			200			170		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.904				0.850			0.850
Flt Protected					0.988		0.950			0.950		
Satd. Flow (prot)	0	1845	1845	0	1648	0	1752	1845	1568	1752	1845	1568
Flt Permitted					0.988		0.950			0.950		
Satd. Flow (perm)	0	1845	1845	0	1648	0	1752	1845	1568	1752	1845	1568
Link Speed (mph)		30			30			55			55	
Link Distance (ft)		577			559			794			1152	
Travel Time (s)		13.1			12.7			9.8			14.3	
Peak Hour Factor	1.00	1.00	1.00	0.75	0.50	0.87	0.69	0.88	0.63	0.75	0.86	0.83
Adj. Flow (vph)	0	0	0	24	4	68	64	382	24	40	313	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	96	0	64	382	24	40	313	48
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	35.8%						ICU Level of Service A					
Analysis Period (min)	15											

# Lanes, Volumes, Timings

103: Lake Elmo Ave N/ CSAH 17/CSAH 17 & 41st St N

11/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	0	0	18	0	24	13	361	29	15	304	3
Future Volume (vph)	7	0	0	18	0	24	13	361	29	15	304	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	250		250	245		235
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (ft)	25			25			135			140		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.919				0.850			0.850
Flt Protected		0.950			0.980		0.950			0.950		
Satd. Flow (prot)	0	1752	0	0	1661	0	1752	1845	1568	1752	1845	1568
Flt Permitted		0.950			0.980		0.950			0.950		
Satd. Flow (perm)	0	1752	0	0	1661	0	1752	1845	1568	1752	1845	1568
Link Speed (mph)		30			30			55			55	
Link Distance (ft)		485			401			1152			444	
Travel Time (s)		11.0			9.1			14.3			5.5	
Peak Hour Factor	0.88	1.00	1.00	0.75	1.00	0.67	0.65	0.89	0.91	0.63	0.81	0.38
Adj. Flow (vph)	8	0	0	24	0	36	20	406	32	24	375	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	8	0	0	60	0	20	406	32	24	375	8
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	29.0%						ICU Level of Service A					
Analysis Period (min)	15											

# Lanes, Volumes, Timings

104: Lake Elmo Ave N/ CSAH 17 & 43rd St N

11/08/2023



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	12	41	39	361	296	6
Future Volume (vph)	12	41	39	361	296	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0			300
Storage Lanes	1	0	1			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.897					0.850
Flt Protected	0.988		0.950			
Satd. Flow (prot)	1635	0	1752	1845	1845	1568
Flt Permitted	0.988		0.950			
Satd. Flow (perm)	1635	0	1752	1845	1845	1568
Link Speed (mph)	55			55	55	
Link Distance (ft)	833			740	1462	
Travel Time (s)	10.3			9.2	18.1	
Peak Hour Factor	0.75	0.79	0.65	0.90	0.85	0.75
Adj. Flow (vph)	16	52	60	401	348	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	68	0	60	401	348	8
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

## Intersection Summary

Area Type: Other

Control Type: Unsignalized

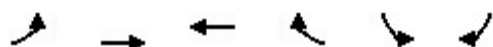
Intersection Capacity Utilization 32.2% ICU Level of Service A

Analysis Period (min) 15

# Lanes, Volumes, Timings

101: Stillwater Blvd / CSAH 14 & Lake Elmo Ave N/ CSAH 17

11/08/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4	Ø8
Detector Phase	2	2	6	6	7	3		
Switch Phase								
Minimum Initial (s)	15.0	15.0	15.0	15.0	7.0	7.0	1.0	1.0
Minimum Split (s)	24.0	24.0	45.0	45.0	35.0	35.0	35.0	29.0
Total Split (s)	66.0	66.0	66.0	66.0	35.0	65.0	35.0	29.0
Total Split (%)	39.8%	39.8%	39.8%	39.8%	21.1%	39.2%	21%	17%
Maximum Green (s)	60.0	60.0	60.0	60.0	30.0	60.0	30.0	24.0
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0		
Lead/Lag					Lead	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Vehicle Extension (s)	4.3	4.3	4.3	4.3	3.0	3.0	3.0	3.0
Recall Mode	Min	Min	Min	Min	None	None	None	None
Walk Time (s)			7.0	7.0			7.0	7.0
Flash Dont Walk (s)			32.0	32.0			23.0	17.0
Pedestrian Calls (#/hr)			0	0			0	0
Act Effect Green (s)	28.6	28.6	28.6	28.6	14.8	14.8		
Actuated g/C Ratio	0.52	0.52	0.52	0.52	0.27	0.27		
v/c Ratio	0.30	0.60	0.34	0.14	0.43	0.24		
Control Delay	9.6	12.5	9.0	2.1	21.6	5.8		
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		
Total Delay	9.6	12.5	9.0	2.1	21.6	5.8		
LOS	A	B	A	A	C	A		
Approach Delay		11.8	7.1		15.6			
Approach LOS		B	A		B			

## Intersection Summary

Area Type: Other

Cycle Length: 166

Actuated Cycle Length: 54.8

Natural Cycle: 115

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 11.2

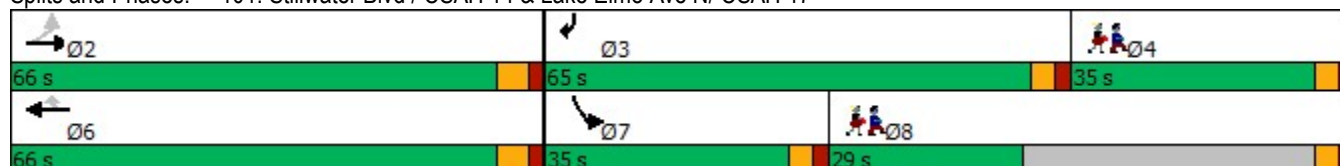
Intersection LOS: B

Intersection Capacity Utilization 53.0%

ICU Level of Service A

Analysis Period (min) 15

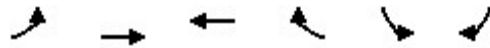
Splits and Phases: 101: Stillwater Blvd / CSAH 14 & Lake Elmo Ave N/ CSAH 17



# Phasings

101: Stillwater Blvd / CSAH 14 & Lake Elmo Ave N/ CSAH 17

11/08/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4	Ø8
Protected Phases		2	6		7	3	4	8
Permitted Phases	2			6				
Minimum Initial (s)	15.0	15.0	15.0	15.0	7.0	7.0	1.0	1.0
Minimum Split (s)	24.0	24.0	45.0	45.0	35.0	35.0	35.0	29.0
Total Split (s)	66.0	66.0	66.0	66.0	35.0	65.0	35.0	29.0
Total Split (%)	39.8%	39.8%	39.8%	39.8%	21.1%	39.2%	21%	17%
Maximum Green (s)	60.0	60.0	60.0	60.0	30.0	60.0	30.0	24.0
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag					Lead	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Vehicle Extension (s)	4.3	4.3	4.3	4.3	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	Min	Min	Min	Min	None	None	None	None
Walk Time (s)			7.0	7.0			7.0	7.0
Flash Dont Walk (s)			32.0	32.0			23.0	17.0
Pedestrian Calls (#/hr)			0	0			0	0
90th %ile Green (s)	39.9	39.9	39.9	39.9	20.0	20.0	0.0	0.0
90th %ile Term Code	Gap	Gap	Hold	Hold	Gap	Hold	Skip	Skip
70th %ile Green (s)	33.5	33.5	33.5	33.5	17.1	17.1	0.0	0.0
70th %ile Term Code	Gap	Gap	Hold	Hold	Gap	Hold	Skip	Skip
50th %ile Green (s)	28.8	28.8	28.8	28.8	15.2	15.2	0.0	0.0
50th %ile Term Code	Gap	Gap	Hold	Hold	Gap	Hold	Skip	Skip
30th %ile Green (s)	23.9	23.9	23.9	23.9	12.6	12.6	0.0	0.0
30th %ile Term Code	Gap	Gap	Hold	Hold	Gap	Hold	Skip	Skip
10th %ile Green (s)	18.5	18.5	18.5	18.5	9.6	9.6	0.0	0.0
10th %ile Term Code	Gap	Gap	Hold	Hold	Gap	Hold	Skip	Skip

## Intersection Summary

Cycle Length: 166

Actuated Cycle Length: 54.8

Control Type: Actuated-Uncoordinated

90th %ile Actuated Cycle: 70.9

70th %ile Actuated Cycle: 61.6

50th %ile Actuated Cycle: 55

30th %ile Actuated Cycle: 47.5






















10th %ile Actuated Cycle: 39.1



# Lanes, Volumes, Timings

102: Lake Elmo Ave N/ CSAH 17 & 39th St N





















11/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	18	2	59	44	336	15	30	269	40
Future Volume (vph)	0	0	0	18	2	59	44	336	15	30	269	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		175	0		0	340		195	320		295
Storage Lanes	0		1	0		0	1		1	1		1
Taper Length (ft)	25			25			200			170		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.904				0.850			0.850
Flt Protected					0.988		0.950			0.950		
Satd. Flow (prot)	0	1845	1845	0	1648	0	1752	1845	1568	1752	1845	1568
Flt Permitted					0.988		0.950			0.950		
Satd. Flow (perm)	0	1845	1845	0	1648	0	1752	1845	1568	1752	1845	1568
Link Speed (mph)		30			30			55			55	
Link Distance (ft)		577			559			794			1152	
Travel Time (s)		13.1			12.7			9.8			14.3	
Peak Hour Factor	1.00	1.00	1.00	0.75	0.50	0.87	0.69	0.88	0.63	0.75	0.86	0.83
Adj. Flow (vph)	0	0	0	24	4	68	64	382	24	40	313	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	96	0	64	382	24	40	313	48
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	35.8%						ICU Level of Service A					
Analysis Period (min)	15											

# Lanes, Volumes, Timings

103: Lake Elmo Ave N/ CSAH 17/CSAH 17 & 41st St N

11/08/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	0	0	18	0	24	13	361	29	15	304	3
Future Volume (vph)	7	0	0	18	0	24	13	361	29	15	304	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	250		250	245		235
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (ft)	25			25			135			140		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.919				0.850			0.850
Flt Protected		0.950			0.980		0.950			0.950		
Satd. Flow (prot)	0	1752	0	0	1661	0	1752	1845	1568	1752	1845	1568
Flt Permitted		0.950			0.980		0.950			0.950		
Satd. Flow (perm)	0	1752	0	0	1661	0	1752	1845	1568	1752	1845	1568
Link Speed (mph)		30			30			55			55	
Link Distance (ft)		485			401			1152			444	
Travel Time (s)		11.0			9.1			14.3			5.5	
Peak Hour Factor	0.88	1.00	1.00	0.75	1.00	0.67	0.65	0.89	0.91	0.63	0.81	0.38
Adj. Flow (vph)	8	0	0	24	0	36	20	406	32	24	375	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	8	0	0	60	0	20	406	32	24	375	8
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	29.0%						ICU Level of Service A					
Analysis Period (min)	15											

Lanes, Volumes, Timings  
104: Lake Elmo Ave N/ CSAH 17 & 43rd St N

11/08/2023



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	12	41	39	361	296	6
Future Volume (vph)	12	41	39	361	296	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0			300
Storage Lanes	1	0	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.897					0.850
Flt Protected	0.988			0.994		
Satd. Flow (prot)	1635	0	0	1834	1845	1568
Flt Permitted	0.988			0.994		
Satd. Flow (perm)	1635	0	0	1834	1845	1568
Link Speed (mph)	55			55	55	
Link Distance (ft)	833			740	1462	
Travel Time (s)	10.3			9.2	18.1	
Peak Hour Factor	0.75	0.79	0.65	0.90	0.85	0.75
Adj. Flow (vph)	16	52	60	401	348	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	68	0	0	461	348	8
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			0	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Sign Control	Stop			Free	Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 50.1% ICU Level of Service A

Analysis Period (min) 15

Lanes, Volumes, Timings  
5101: Stillwater Blvd / CSAH 14

11/08/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱↱	↘	↗
Traffic Volume (vph)	688	1	2	421	1	3
Future Volume (vph)	688	1	2	421	1	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt	0.999					0.850
Flt Protected					0.950	
Satd. Flow (prot)	1843	0	0	3505	1752	1568
Flt Permitted					0.950	
Satd. Flow (perm)	1843	0	0	3505	1752	1568
Link Speed (mph)	55			40	30	
Link Distance (ft)	204			188	352	
Travel Time (s)	2.5			3.2	8.0	
Peak Hour Factor	0.91	0.25	0.50	0.95	0.25	0.38
Adj. Flow (vph)	756	4	4	443	4	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	760	0	0	447	4	8
Enter Blocked Intersection	Yes	Yes	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	0			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane				Yes		
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	46.3%			ICU Level of Service A		
Analysis Period (min)	15					

# SimTraffic Simulation Summary

## Existing Conditions

11/08/2023

### Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	3:45	3:45	3:45	3:45	3:45	3:45
End Time	5:00	5:00	5:00	5:00	5:00	5:00
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4
Volume counts from "S:\2023\230170 - 2024 Washington County Regional Solicitation Applications\TRAFFIC ANALYSIS\SYNCHRO\CSV\100_PM_2023.0						
Volume date = 11/06/2023						
Vehs Entered	1737	1773	1813	1751	1799	1775
Vehs Exited	1727	1762	1801	1760	1797	1772
Starting Vehs	38	34	26	43	34	34
Ending Vehs	48	45	38	34	36	34
Denied Entry Before	1	0	0	2	0	1
Denied Entry After	1	1	0	0	0	0
Travel Distance (mi)	1102	1106	1100	1099	1112	1104
Travel Time (hr)	38.9	39.8	38.9	39.4	39.3	39.2
Total Delay (hr)	6.8	7.4	6.7	7.1	6.8	7.0
Total Stops	885	916	849	904	882	890
Fuel Used (gal)	39.0	39.4	38.8	38.8	39.6	39.1

### Interval #0 Information Seeding

Start Time	3:45
End Time	4:00
Total Time (min)	15
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

### Interval #1 Information Recording

Start Time	4:00					
End Time	4:15					
Total Time (min)	15					
Volumes adjusted by Growth Factors.						
Run Number	1	2	3	4	5	Avg
Vehs Entered	444	488	453	460	470	465
Vehs Exited	455	466	434	458	465	456
Starting Vehs	38	34	26	43	34	34
Ending Vehs	27	56	45	45	39	39
Denied Entry Before	1	0	0	2	0	1
Denied Entry After	0	0	0	0	0	0
Travel Distance (mi)	276	318	265	288	293	288
Travel Time (hr)	9.9	11.3	9.3	10.5	10.4	10.3
Total Delay (hr)	1.8	2.2	1.5	2.0	1.9	1.9
Total Stops	207	244	192	239	225	225
Fuel Used (gal)	9.8	11.4	9.4	10.2	10.2	10.2

# SimTraffic Simulation Summary

## Existing Conditions

11/08/2023

### Interval #2 Information Recording

Start Time 4:15  
End Time 4:30  
Total Time (min) 15

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	458	430	422	423	438	433
Vehs Exited	439	445	422	423	438	432
Starting Vehs	27	56	45	45	39	39
Ending Vehs	46	41	45	45	39	41
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0
Travel Distance (mi)	293	269	268	273	272	275
Travel Time (hr)	10.4	9.7	9.5	9.7	9.5	9.8
Total Delay (hr)	1.9	1.8	1.8	1.8	1.6	1.8
Total Stops	243	236	220	223	216	228
Fuel Used (gal)	10.4	9.6	9.5	9.6	9.7	9.7

### Interval #3 Information Recording

Start Time 4:30  
End Time 4:45  
Total Time (min) 15

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	417	394	435	411	445	420
Vehs Exited	426	403	447	420	445	429
Starting Vehs	46	41	45	45	39	41
Ending Vehs	37	32	33	36	39	34
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0
Travel Distance (mi)	259	229	271	245	274	256
Travel Time (hr)	9.1	8.1	9.5	8.6	9.6	9.0
Total Delay (hr)	1.5	1.4	1.6	1.4	1.6	1.5
Total Stops	222	194	199	195	208	205
Fuel Used (gal)	9.3	8.1	9.5	8.7	9.8	9.1

# SimTraffic Simulation Summary

## Existing Conditions

11/08/2023

### Interval #4 Information Recording

Start Time 4:45  
End Time 5:00  
Total Time (min) 15

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	418	461	503	457	446	457
Vehs Exited	407	448	498	459	449	453
Starting Vehs	37	32	33	36	39	34
Ending Vehs	48	45	38	34	36	34
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	1	1	0	0	0	0
Travel Distance (mi)	274	291	296	292	273	285
Travel Time (hr)	9.5	10.7	10.5	10.5	9.8	10.2
Total Delay (hr)	1.5	2.1	1.8	1.9	1.8	1.8
Total Stops	213	242	238	247	233	233
Fuel Used (gal)	9.6	10.2	10.5	10.3	9.8	10.1

101: Stillwater Blvd / CSAH 14 & Lake Elmo Ave N/ CSAH 17 Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Total Delay (hr)	0.6	1.1	0.4	0.0	1.2	0.0	0.7	4.0
Total Del/Veh (s)	16.3	7.2	4.6	1.5	22.8	0.6	21.1	10.3
Stop Delay (hr)	0.5	0.5	0.2	0.0	1.0	0.0	0.7	3.0
Stop Del/Veh (s)	13.6	3.2	2.8	1.2	19.8	0.0	20.4	7.6
Total Stops	112	166	85	39	147	0	96	645
Stop/Veh	0.81	0.32	0.27	0.37	0.79	0.00	0.82	0.46
Travel Dist (mi)	9.5	35.9	9.5	3.2	31.2	1.0	19.9	110.3
Travel Time (hr)	1.0	2.0	0.6	0.2	2.1	0.0	1.4	7.4
Avg Speed (mph)	10	18	15	14	15	37	15	15
Fuel Used (gal)	0.4	1.5	0.4	0.1	1.4	0.1	1.0	4.8
Fuel Eff. (mpg)	24.8	23.2	26.8	50.8	21.7	16.5	20.8	23.0
HC Emissions (g)	3	25	5	0	23	2	17	74
CO Emissions (g)	123	1068	161	11	1213	86	875	3537
NOx Emissions (g)	10	73	14	1	61	5	45	208
Vehicles Entered	138	525	314	106	185	11	116	1395
Vehicles Exited	138	524	313	106	184	12	116	1393
Hourly Exit Rate	138	524	313	106	184	12	116	1393
Input Volume	142	511	315	109	178	7	112	1374
% of Volume	97	103	99	97	103	171	104	101
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0
Density (ft/veh)								371
Occupancy (veh)	1	2	1	0	2	0	1	7



102: Lake Elmo Ave N/ CSAH 17 & 39th St N Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.1	0.1	1.6	0.1	1.2	0.1	0.0	0.2	0.2
Total Delay (hr)	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.2	0.0	0.5
Total Del/Veh (s)	11.6	7.7	4.2	2.8	1.2	0.2	2.1	2.3	0.3	2.1
Stop Delay (hr)	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Stop Del/Veh (s)	9.4	3.8	3.9	1.4	0.0	0.0	1.1	0.0	0.0	0.6
Total Stops	18	2	53	16	0	0	11	0	0	100
Stop/Veh	1.00	1.00	1.00	0.37	0.00	0.00	0.38	0.00	0.00	0.12
Travel Dist (mi)	1.8	0.2	5.2	5.0	40.4	1.7	6.2	59.9	8.9	129.3
Travel Time (hr)	0.1	0.0	0.3	0.2	1.0	0.1	0.2	1.3	0.2	3.4
Avg Speed (mph)	14	18	18	26	40	32	37	45	42	38
Fuel Used (gal)	0.1	0.0	0.2	0.2	2.6	0.1	0.2	1.6	0.3	5.2
Fuel Eff. (mpg)	31.8	30.8	34.6	22.7	15.5	21.6	32.3	36.9	32.9	24.9
HC Emissions (g)	0	0	1	3	46	2	2	34	7	97
CO Emissions (g)	14	2	38	220	2974	101	141	1505	298	5293
NOx Emissions (g)	1	0	3	10	140	6	8	101	20	289
Vehicles Entered	18	2	53	43	337	14	29	281	42	819
Vehicles Exited	18	2	52	43	337	14	29	283	42	820
Hourly Exit Rate	18	2	52	43	337	14	29	283	42	820
Input Volume	18	2	59	44	336	15	30	270	40	814
% of Volume	100	100	88	98	100	93	97	105	105	101
Denied Entry Before	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0
Density (ft/veh)										2114
Occupancy (veh)	0	0	0	0	1	0	0	1	0	3

103: Lake Elmo Ave N/ CSAH 17/CSAH 17 & 41st St N Performance by movement

Movement	EBL	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.1	0.1	0.3	0.0	0.2	0.0	0.0	0.0	0.0
Total Delay (hr)	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.4
Total Del/Veh (s)	10.9	9.2	4.1	2.1	2.7	0.5	3.3	0.3	0.1	1.9
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Stop Del/Veh (s)	9.3	7.5	4.3	0.8	0.1	0.1	1.9	0.0	0.0	0.4
Total Stops	6	19	25	4	0	0	5	0	0	59
Stop/Veh	1.00	1.00	1.00	0.29	0.00	0.00	0.42	0.00	0.00	0.07
Travel Dist (mi)	0.5	1.3	1.7	3.0	75.9	6.7	1.0	27.5	0.3	118.0
Travel Time (hr)	0.0	0.1	0.1	0.1	1.8	0.2	0.0	0.7	0.0	3.1
Avg Speed (mph)	14	13	16	36	43	39	21	37	25	38
Fuel Used (gal)	0.0	0.0	0.0	0.1	2.1	0.2	0.0	2.1	0.0	4.7
Fuel Eff. (mpg)	36.8	37.9	38.1	35.6	35.7	34.0	28.4	13.0	28.4	25.4
HC Emissions (g)	0	0	0	1	38	3	1	44	0	87
CO Emissions (g)	2	7	7	53	1728	159	36	2658	9	4657
NOx Emissions (g)	0	1	1	3	118	9	2	126	0	260
Vehicles Entered	6	19	25	14	360	31	12	333	3	803
Vehicles Exited	6	19	25	14	361	32	12	334	3	806
Hourly Exit Rate	6	19	25	14	361	32	12	334	3	806
Input Volume	7	18	24	13	370	29	15	319	3	798
% of Volume	86	106	104	108	98	110	80	105	100	101
Denied Entry Before	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0
Density (ft/veh)										1742
Occupancy (veh)	0	0	0	0	2	0	0	1	0	3

104: Lake Elmo Ave N/ CSAH 17 & 43rd St N Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.2	0.1	0.0	0.0	0.3	3.3	0.1
Total Delay (hr)	0.0	0.0	0.0	0.2	0.2	0.0	0.6
Total Del/Veh (s)	8.4	3.2	3.3	2.4	2.7	0.3	2.7
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Stop Del/Veh (s)	7.4	3.1	2.0	0.1	0.0	0.0	0.4
Total Stops	11	43	17	5	0	0	76
Stop/Veh	1.00	1.00	0.42	0.01	0.00	0.00	0.10
Travel Dist (mi)	1.6	6.5	5.6	48.3	82.7	1.4	146.1
Travel Time (hr)	0.1	0.2	0.2	1.4	1.8	0.0	3.7
Avg Speed (mph)	24	30	27	36	47	45	40
Fuel Used (gal)	0.0	0.2	0.2	2.1	2.0	0.0	4.6
Fuel Eff. (mpg)	34.4	33.7	23.1	23.0	41.2	39.4	31.6
HC Emissions (g)	0	4	4	38	43	0	89
CO Emissions (g)	29	172	238	2229	1542	19	4229
NOx Emissions (g)	1	11	11	105	141	1	271
Vehicles Entered	11	43	40	346	305	5	750
Vehicles Exited	11	43	40	345	305	5	749
Hourly Exit Rate	11	43	40	345	305	5	749
Input Volume	12	41	39	361	296	6	755
% of Volume	92	105	103	96	103	83	99
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)	1210						
Occupancy (veh)	0	0	0	1	2	0	4

5101: Stillwater Blvd / CSAH 14 Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Delay (hr)	0.4	0.0	0.0	0.1	0.0	0.0	0.5
Total Del/Veh (s)	2.1	0.8	5.8	1.0	10.6	6.2	1.7
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.1	0.0	3.9	0.1	9.5	6.7	0.1
Total Stops	0	0	1	4	2	3	10
Stop/Veh	0.00	0.00	1.00	0.01	1.00	1.00	0.01
Travel Dist (mi)	24.3	0.0	0.0	14.7	0.1	0.2	39.4
Travel Time (hr)	1.1	0.0	0.0	0.5	0.0	0.0	1.6
Avg Speed (mph)	22	16	13	30	10	13	24
Fuel Used (gal)	1.4	0.0	0.0	0.3	0.0	0.0	1.7
Fuel Eff. (mpg)	17.0	25.4	40.5	54.3	34.7	41.4	23.0
HC Emissions (g)	22	0	0	4	0	0	26
CO Emissions (g)	719	0	0	121	0	0	841
NOx Emissions (g)	84	0	0	12	0	0	96
Vehicles Entered	707	1	1	417	2	3	1131
Vehicles Exited	706	1	1	417	2	3	1130
Hourly Exit Rate	706	1	1	417	2	3	1130
Input Volume	688	1	2	421	1	3	1116
% of Volume	103	100	50	99	200	100	101
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)							721
Occupancy (veh)	1	0	0	0	0	0	2

### Total Network Performance

Denied Delay (hr)	0.2
Denied Del/Veh (s)	0.5
Total Delay (hr)	6.7
Total Del/Veh (s)	13.4
Stop Delay (hr)	3.4
Stop Del/Veh (s)	6.8
Total Stops	890
Stop/Veh	0.49
Travel Dist (mi)	1103.6
Travel Time (hr)	39.2
Avg Speed (mph)	28
Fuel Used (gal)	39.1
Fuel Eff. (mpg)	28.2
HC Emissions (g)	618
CO Emissions (g)	24696
NOx Emissions (g)	1848
Vehicles Entered	1775
Vehicles Exited	1772
Hourly Exit Rate	1772
Input Volume	10044
% of Volume	18
Denied Entry Before	1
Denied Entry After	0
Density (ft/veh)	646
Occupancy (veh)	39

Queuing and Blocking Report  
Existing Conditions

11/08/2023

Intersection: 101: Stillwater Blvd / CSAH 14 & Lake Elmo Ave N/ CSAH 17

Movement	EB	EB	WB	WB	SB	SB
Directions Served	L	T	T	R	L	R
Maximum Queue (ft)	136	222	103	60	178	99
Average Queue (ft)	56	93	55	24	69	35
95th Queue (ft)	104	165	97	52	132	78
Link Distance (ft)		306	86	86	841	
Upstream Blk Time (%)		0	2	0		
Queuing Penalty (veh)		0	3	0		
Storage Bay Dist (ft)	240					305
Storage Blk Time (%)		0				
Queuing Penalty (veh)		0				

Intersection: 102: Lake Elmo Ave N/ CSAH 17 & 39th St N

Movement	WB	NB	SB
Directions Served	LTR	L	L
Maximum Queue (ft)	61	36	37
Average Queue (ft)	24	11	8
95th Queue (ft)	45	31	28
Link Distance (ft)	511		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		340	320
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 103: Lake Elmo Ave N/ CSAH 17/CSAH 17 & 41st St N

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	L	L
Maximum Queue (ft)	26	45	28	36
Average Queue (ft)	4	20	3	5
95th Queue (ft)	19	36	16	24
Link Distance (ft)	438	353		
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			250	245
Storage Blk Time (%)				
Queuing Penalty (veh)				

Queuing and Blocking Report  
Existing Conditions

11/08/2023

Intersection: 104: Lake Elmo Ave N/ CSAH 17 & 43rd St N

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	36	82
Average Queue (ft)	16	17
95th Queue (ft)	31	56
Link Distance (ft)	792	689
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5101: Stillwater Blvd / CSAH 14

Movement	WB	NB	NB
Directions Served	LT	L	R
Maximum Queue (ft)	74	19	18
Average Queue (ft)	4	1	1
95th Queue (ft)	32	10	9
Link Distance (ft)	132	307	307
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 3
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Actuated Signals, Observed Splits  
Existing Conditions

11/08/2023

Intersection: 101: Stillwater Blvd / CSAH 14 & Lake Elmo Ave N/ CSAH 17

Phase	2	3	4	6	7	8
Movement(s) Served	EBTL	SBR	Ped	WBT	SBL	Ped
Maximum Green (s)	60.0	60.0	30.0	60.0	30.0	24.0
Minimum Green (s)	15.0	7.0	1.0	15.0	7.0	1.0
Recall	Min	None	None	Min	None	None
Avg. Green (s)	32.2	11.9	10.6	32.2	12.0	9.1
g/C Ratio	NA	-0.01	-0.01	NA	-0.01	-0.01
Cycles Skipped (%)	0	22	76	0	13	87
Cycles @ Minimum (%)	3	11	0	3	13	0
Cycles Maxed Out (%)	6	0	0	6	0	0
Cycles with Peds (%)	0	0	0	0	0	0

Controller Summary

Average Cycle Length (s): NA

Number of Complete Cycles : 0



# SimTraffic Simulation Summary

## Proposed Conditions

11/08/2023

### Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	3:45	3:45	3:45	3:45	3:45	3:45
End Time	5:00	5:00	5:00	5:00	5:00	5:00
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4
Volume counts from "S:\2023\230170 - 2024 Washington County Regional Solicitation Applications\TRAFFIC ANALYSIS\SYNCHRO\CSV\100_PM_2023_						
Volume date = 11/06/2023						
Vehs Entered	1785	1830	1722	1707	1795	1767
Vehs Exited	1773	1836	1732	1686	1794	1763
Starting Vehs	24	42	41	22	32	31
Ending Vehs	36	36	31	43	33	34
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0
Travel Distance (mi)	1126	1184	1097	1074	1131	1122
Travel Time (hr)	39.8	41.5	37.0	36.6	39.0	38.8
Total Delay (hr)	6.3	6.5	4.5	4.7	5.6	5.5
Total Stops	751	780	496	533	652	642
Fuel Used (gal)	40.1	42.1	38.8	37.9	40.1	39.8

### Interval #0 Information Seeding

Start Time	3:45
End Time	4:00
Total Time (min)	15
Volumes adjusted by Growth Factors.	
No data recorded this interval.	

### Interval #1 Information Recording

Start Time	4:00					
End Time	4:15					
Total Time (min)	15					
Volumes adjusted by Growth Factors.						
Run Number	1	2	3	4	5	Avg
Vehs Entered	443	488	456	458	470	465
Vehs Exited	437	477	451	438	464	451
Starting Vehs	24	42	41	22	32	31
Ending Vehs	30	53	46	42	38	40
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0
Travel Distance (mi)	274	322	280	285	290	290
Travel Time (hr)	10.0	11.4	9.6	9.8	9.8	10.1
Total Delay (hr)	1.9	1.9	1.2	1.3	1.2	1.5
Total Stops	221	252	133	156	132	181
Fuel Used (gal)	9.9	11.6	9.8	10.0	10.1	10.3

# SimTraffic Simulation Summary

## Proposed Conditions

11/08/2023

### Interval #2 Information Recording

Start Time 4:15  
End Time 4:30  
Total Time (min) 15

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	458	439	413	401	490	439
Vehs Exited	459	451	431	403	475	445
Starting Vehs	30	53	46	42	38	40
Ending Vehs	29	41	28	40	53	35
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	1	1	0
Travel Distance (mi)	294	280	272	245	313	281
Travel Time (hr)	10.7	10.0	9.3	8.3	10.9	9.8
Total Delay (hr)	1.9	1.7	1.2	1.0	1.7	1.5
Total Stops	237	192	165	115	204	181
Fuel Used (gal)	10.4	9.9	9.7	8.6	11.1	9.9

### Interval #3 Information Recording

Start Time 4:30  
End Time 4:45  
Total Time (min) 15

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	432	436	432	422	398	426
Vehs Exited	420	438	419	420	419	425
Starting Vehs	29	41	28	40	53	35
Ending Vehs	41	39	41	42	32	34
Denied Entry Before	0	0	0	1	1	0
Denied Entry After	0	0	0	0	0	0
Travel Distance (mi)	260	277	268	267	257	266
Travel Time (hr)	8.9	9.5	8.9	8.9	8.8	9.0
Total Delay (hr)	1.1	1.3	1.0	1.1	1.3	1.2
Total Stops	124	164	114	116	127	128
Fuel Used (gal)	9.1	10.0	9.4	9.5	9.2	9.4

# SimTraffic Simulation Summary

## Proposed Conditions

11/08/2023

### Interval #4 Information Recording

Start Time 4:45  
End Time 5:00  
Total Time (min) 15

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	452	467	421	426	437	440
Vehs Exited	457	470	431	425	436	445
Starting Vehs	41	39	41	42	32	34
Ending Vehs	36	36	31	43	33	34
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0
Travel Distance (mi)	297	306	278	277	272	286
Travel Time (hr)	10.2	10.5	9.3	9.5	9.5	9.8
Total Delay (hr)	1.4	1.5	1.1	1.3	1.4	1.3
Total Stops	169	172	84	146	189	151
Fuel Used (gal)	10.6	10.6	9.9	9.8	9.7	10.1

SimTraffic Performance Report  
Proposed Conditions

11/08/2023

101: Stillwater Blvd / CSAH 14 & Lake Elmo Ave N/ CSAH 17 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
Total Delay (hr)	0.3	1.6	0.0	0.0	0.4	0.1	0.0	0.0	0.2	0.0	0.1	2.8
Total Del/Veh (s)	8.2	11.2	3.7	3.5	4.9	3.0	4.0	2.9	4.6	0.6	4.2	7.3
Stop Delay (hr)	0.2	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	1.1
Stop Del/Veh (s)	4.6	4.9	0.0	1.2	0.5	0.6	1.2	0.5	1.3	0.0	0.9	2.7
Total Stops	57	210	0	0	42	17	0	0	52	0	22	400
Stop/Veh	0.40	0.41	0.00	0.00	0.14	0.15	0.00	0.00	0.29	0.00	0.18	0.29
Travel Dist (mi)	8.8	31.8	0.1	0.1	10.3	3.8	0.1	0.1	30.8	0.9	20.7	107.4
Travel Time (hr)	0.7	2.4	0.0	0.0	0.7	0.3	0.0	0.0	1.1	0.0	0.7	5.9
Avg Speed (mph)	13	13	20	14	15	15	18	18	28	37	28	18
Fuel Used (gal)	0.3	1.0	0.0	0.0	0.4	0.1	0.0	0.0	1.3	0.1	0.9	3.9
Fuel Eff. (mpg)	33.3	32.8	34.0	27.9	27.9	27.9	42.4	45.4	24.5	16.3	24.1	27.4
HC Emissions (g)	2	10	0	0	4	2	0	0	20	2	16	56
CO Emissions (g)	61	237	1	0	102	44	0	0	1182	86	868	2582
NOx Emissions (g)	8	29	0	0	15	6	0	0	57	6	45	166
Vehicles Entered	142	513	1	2	302	112	1	2	179	9	120	1383
Vehicles Exited	143	513	1	2	302	113	1	2	178	9	120	1384
Hourly Exit Rate	143	513	1	2	302	113	1	2	178	9	120	1384
Input Volume	142	511	1	2	313	109	1	3	178	7	112	1379
% of Volume	101	100	100	100	96	104	100	67	100	129	107	100
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0
Density (ft/veh)												336
Occupancy (veh)	1	2	0	0	1	0	0	0	1	0	1	6

102: Lake Elmo Ave N/ CSAH 17 & 39th St N Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.1	0.1	1.4	0.1	1.7	0.1	0.0	0.2	0.2
Total Delay (hr)	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.2	0.0	0.5
Total Del/Veh (s)	11.0	8.1	4.4	2.3	1.2	0.2	2.0	2.3	0.3	2.1
Stop Delay (hr)	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Stop Del/Veh (s)	9.0	4.9	4.2	1.1	0.0	0.0	1.1	0.0	0.0	0.6
Total Stops	19	2	58	13	0	0	10	0	0	102
Stop/Veh	1.00	1.00	1.00	0.30	0.00	0.00	0.34	0.00	0.00	0.12
Travel Dist (mi)	1.9	0.2	5.7	5.2	41.8	1.8	6.2	59.1	8.6	130.4
Travel Time (hr)	0.1	0.0	0.3	0.2	1.0	0.1	0.2	1.3	0.2	3.5
Avg Speed (mph)	14	18	18	27	40	31	37	45	42	38
Fuel Used (gal)	0.1	0.0	0.2	0.2	2.6	0.1	0.2	1.6	0.3	5.3
Fuel Eff. (mpg)	31.5	39.9	34.5	22.0	15.8	23.5	31.1	35.9	33.1	24.7
HC Emissions (g)	0	0	3	4	54	2	2	28	5	99
CO Emissions (g)	12	1	74	254	3155	99	155	1422	256	5427
NOx Emissions (g)	1	0	8	12	158	5	7	85	16	292
Vehicles Entered	19	2	58	43	346	15	29	279	41	832
Vehicles Exited	19	2	58	43	345	15	29	280	41	832
Hourly Exit Rate	19	2	58	43	345	15	29	280	41	832
Input Volume	18	2	59	44	336	15	30	270	40	814
% of Volume	106	100	98	98	103	100	97	104	102	102
Denied Entry Before	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0
Density (ft/veh)										2085
Occupancy (veh)	0	0	0	0	1	0	0	1	0	3

103: Lake Elmo Ave N/ CSAH 17/CSAH 17 & 41st St N Performance by movement

Movement	EBL	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.1	0.2	0.1	0.3	0.0	0.2	0.0	0.0	0.0	0.0
Total Delay (hr)	0.0	0.1	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.5
Total Del/Veh (s)	11.5	12.4	5.8	2.2	2.8	0.6	3.8	0.3	0.1	2.1
Stop Delay (hr)	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Stop Del/Veh (s)	10.2	10.4	5.3	1.2	0.1	0.0	2.3	0.0	0.0	0.6
Total Stops	7	20	25	5	0	0	7	0	0	64
Stop/Veh	1.00	1.00	1.00	0.33	0.00	0.00	0.47	0.00	0.00	0.08
Travel Dist (mi)	0.6	1.3	1.7	3.0	79.5	6.0	1.3	26.9	0.3	120.6
Travel Time (hr)	0.0	0.1	0.1	0.1	1.9	0.2	0.1	0.7	0.0	3.2
Avg Speed (mph)	13	11	15	35	43	39	21	37	25	38
Fuel Used (gal)	0.0	0.0	0.1	0.1	2.3	0.2	0.0	2.1	0.0	4.8
Fuel Eff. (mpg)	34.8	31.3	33.5	31.8	34.6	35.1	26.8	12.9	25.9	25.0
HC Emissions (g)	0	0	0	1	49	4	1	43	0	99
CO Emissions (g)	2	7	11	73	2051	158	37	2603	8	4949
NOx Emissions (g)	0	1	1	5	149	12	2	121	0	291
Vehicles Entered	7	20	25	15	375	28	15	327	3	815
Vehicles Exited	7	20	25	15	374	28	15	326	3	813
Hourly Exit Rate	7	20	25	15	374	28	15	326	3	813
Input Volume	7	18	24	13	370	29	15	319	3	798
% of Volume	100	111	104	115	101	97	100	102	100	102
Denied Entry Before	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0
Density (ft/veh)										1680
Occupancy (veh)	0	0	0	0	2	0	0	1	0	3

104: Lake Elmo Ave N/ CSAH 17 & 43rd St N Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.2	0.1	0.0	0.0	0.3	3.9	0.1
Total Delay (hr)	0.0	0.0	0.0	0.2	0.2	0.0	0.5
Total Del/Veh (s)	11.5	3.2	2.9	1.8	2.7	0.3	2.4
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Stop Del/Veh (s)	10.4	3.2	2.1	0.0	0.0	0.0	0.4
Total Stops	13	42	15	0	0	0	70
Stop/Veh	1.00	1.00	0.45	0.00	0.00	0.00	0.09
Travel Dist (mi)	2.0	6.4	4.7	51.4	82.5	1.7	148.6
Travel Time (hr)	0.1	0.2	0.2	1.4	1.8	0.0	3.7
Avg Speed (mph)	21	30	27	37	47	46	41
Fuel Used (gal)	0.1	0.2	0.2	2.2	2.0	0.0	4.8
Fuel Eff. (mpg)	30.8	32.8	20.6	23.1	41.2	36.1	31.2
HC Emissions (g)	1	3	4	48	39	0	95
CO Emissions (g)	38	163	249	2572	1459	29	4509
NOx Emissions (g)	2	9	11	129	131	2	283
Vehicles Entered	13	42	33	369	305	6	768
Vehicles Exited	13	42	33	367	304	6	765
Hourly Exit Rate	13	42	33	367	304	6	765
Input Volume	12	41	39	361	296	6	755
% of Volume	108	102	85	102	103	100	101
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)							1413
Occupancy (veh)	0	0	0	1	2	0	4

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Total Network Performance

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Denied Delay (hr)	0.2
Denied Del/Veh (s)	0.5
Total Delay (hr)	5.3
Total Del/Veh (s)	10.6
Stop Delay (hr)	1.5
Stop Del/Veh (s)	3.1
Total Stops	642
Stop/Veh	0.36
Travel Dist (mi)	1122.5
Travel Time (hr)	38.8
Avg Speed (mph)	29
Fuel Used (gal)	39.8
Fuel Eff. (mpg)	28.2
HC Emissions (g)	647
CO Emissions (g)	25852
NOx Emissions (g)	1918
Vehicles Entered	1767
Vehicles Exited	1763
Hourly Exit Rate	1763
Input Volume	10055
% of Volume	18
Denied Entry Before	0
Denied Entry After	0
Density (ft/veh)	648
Occupancy (veh)	39



Queuing and Blocking Report  
Proposed Conditions

11/08/2023

Intersection: 101: Stillwater Blvd / CSAH 14 & Lake Elmo Ave N/ CSAH 17

Movement	EB	WB	NB	SB
Directions Served	LT	LTR	LTR	LTR
Maximum Queue (ft)	238	84	15	103
Average Queue (ft)	87	31	1	36
95th Queue (ft)	197	74	6	77
Link Distance (ft)	269	126	269	871
Upstream Blk Time (%)	1	0		
Queuing Penalty (veh)	0	0		
Storage Bay Dist (ft)				
Storage Blk Time (%)	5			
Queuing Penalty (veh)	0			

Intersection: 102: Lake Elmo Ave N/ CSAH 17 & 39th St N

Movement	WB	NB	SB
Directions Served	LTR	L	L
Maximum Queue (ft)	72	47	28
Average Queue (ft)	26	8	8
95th Queue (ft)	49	29	27
Link Distance (ft)	511		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		340	320
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 103: Lake Elmo Ave N/ CSAH 17/CSAH 17 & 41st St N

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	L	L
Maximum Queue (ft)	31	60	28	41
Average Queue (ft)	4	27	4	6
95th Queue (ft)	20	51	20	29
Link Distance (ft)	438	354		
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			250	245
Storage Blk Time (%)				
Queuing Penalty (veh)				

## Queuing and Blocking Report

### Proposed Conditions

11/08/2023

Intersection: 104: Lake Elmo Ave N/ CSAH 17 & 43rd St N

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	48	46
Average Queue (ft)	16	10
95th Queue (ft)	32	34
Link Distance (ft)	786	689
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

### Network Summary

Network wide Queuing Penalty: 0



**Traffic Safety Benefit-Cost Calculation**

Highway Safety Improvement Program (HSIP) Reactive Project

**A. Roadway Description**

<b>Route</b>	CSAH 17	<b>District</b>	Metro	<b>County</b>	Washington
<b>Begin RP</b>	n/a	<b>End RP</b>	n/a	<b>Miles</b>	0.8
<b>Location</b>	CSAH 17 (Lake Elmo Avenue) from CSAH 14 (Stillwater Avenue) to 43rd Street				

**B. Project Description**

<b>Proposed Work</b>	RAB at CSAH 17 & CSAH 14, Reconstruct to 2-Lane Divided w/ Turn Lanes				
<b>Project Cost*</b>	\$9,222,800	<b>Installation Year</b>	2029		
<b>Project Service Life</b>	20 years	<b>Traffic Growth Factor</b>	1.8%		

\* exclude Right of Way from Project Cost

**C. Crash Modification Factor**

0.759	Fatal (K) Crashes	<b>Reference</b>	CMF ID 4264: CONVERT SIGNALIZED INTERSECTION TO MODERN ROUNDABOUT		
0.759	Serious Injury (A) Crashes				
0.759	Moderate Injury (B) Crashes	<b>Crash Type</b>	All		
0.759	Possible Injury (C) Crashes				
0.759	Property Damage Only Crashes		<a href="http://www.CMFclearinghouse.org">www.CMFclearinghouse.org</a>		

**D. Crash Modification Factor (optional second CMF)**

	Fatal (K) Crashes	<b>Reference</b>			
	Serious Injury (A) Crashes				
	Moderate Injury (B) Crashes	<b>Crash Type</b>			
	Possible Injury (C) Crashes				
	Property Damage Only Crashes		<a href="http://www.CMFclearinghouse.org">www.CMFclearinghouse.org</a>		

**E. Crash Data**

<b>Begin Date</b>	1/1/2020	<b>End Date</b>	12/31/2022	3 years
<b>Data Source</b>	Minnesota Crash Mapping Analysis Tool (MnCMAT2)			
<b>Crash Severity</b>	All		< optional 2nd CMF >	
K crashes	0			
A crashes	0			
B crashes	1			
C crashes	0			
PDO crashes	1			

**F. Benefit-Cost Calculation**

\$468,386	Benefit (present value)	<b>B/C Ratio = 0.06</b>
\$9,222,800	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](https://mndot.gov/planning/program/appendix_a.html)

Real Discount Rate: 0.8% Default

Traffic Growth Rate: 1.8% 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	0.24	0.08	\$20,083
C crashes	0.00	0.00	\$0
PDO crashes	0.24	0.08	\$1,205

**\$21,288**

## H. Amortized Benefit

Year	Crash Benefits	Present Value
2029	\$21,288	\$21,288
2030	\$21,672	\$21,500
2031	\$22,062	\$21,713
2032	\$22,459	\$21,928
2033	\$22,863	\$22,146
2034	\$23,275	\$22,365
2035	\$23,693	\$22,587
2036	\$24,120	\$22,811
2037	\$24,554	\$23,038
2038	\$24,996	\$23,266
2039	\$25,446	\$23,497
2040	\$25,904	\$23,730
2041	\$26,370	\$23,966
2042	\$26,845	\$24,203
2043	\$27,328	\$24,443
2044	\$27,820	\$24,686
2045	\$28,321	\$24,931
2046	\$28,831	\$25,178
2047	\$29,350	\$25,428
2048	\$29,878	\$25,680
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	\$0

**Total = \$468,386**

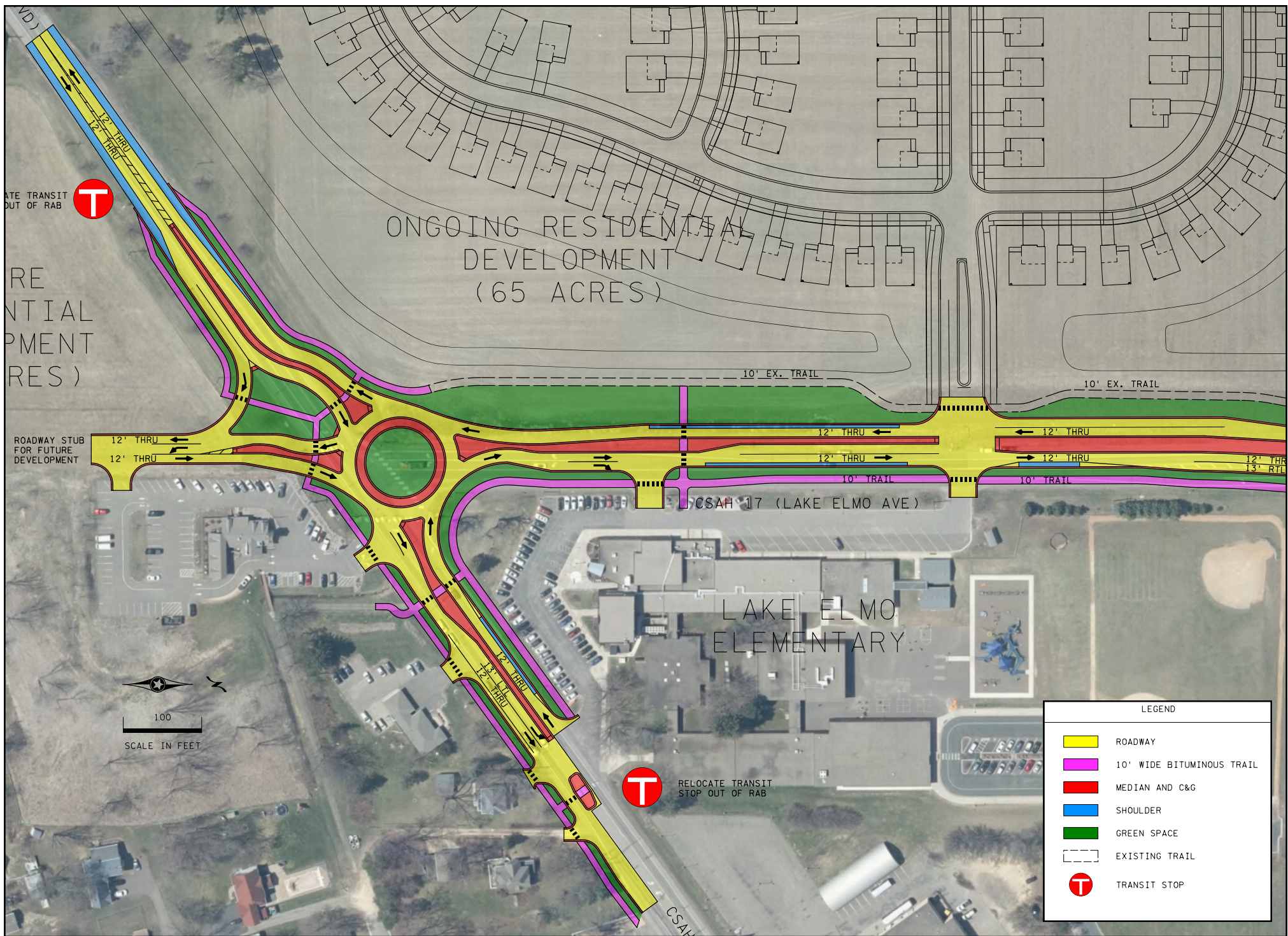
**NOTE:**

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

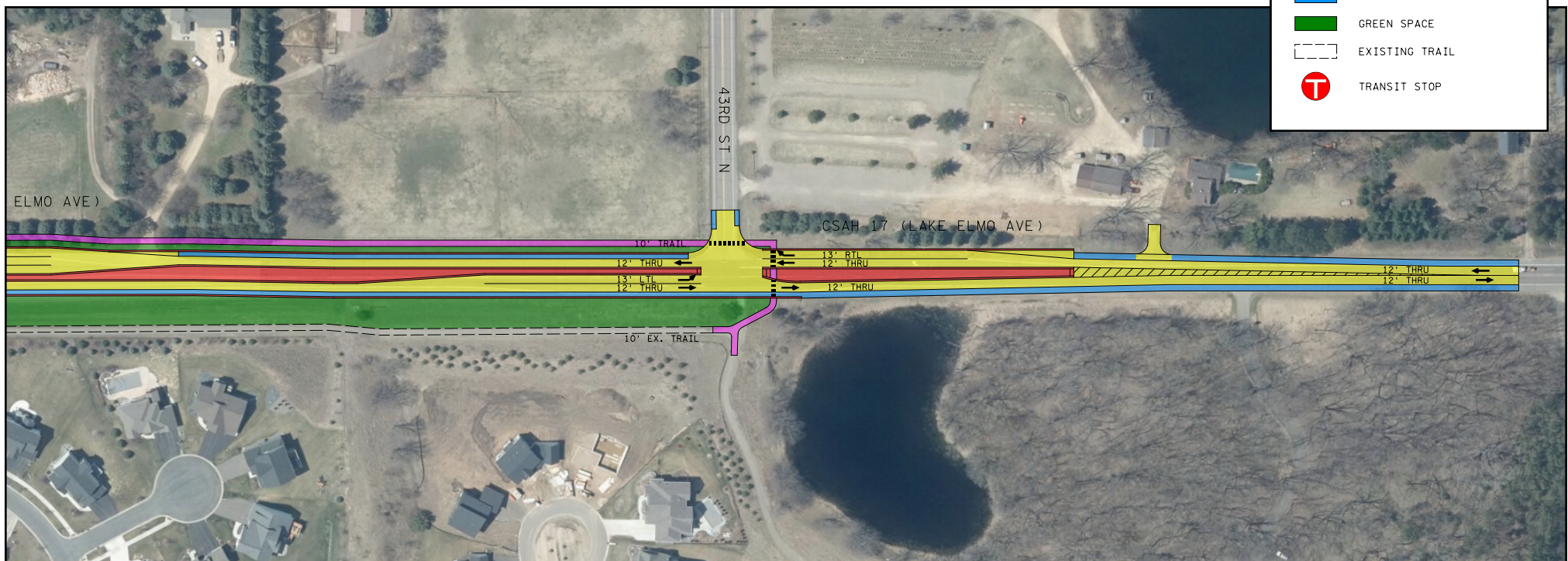
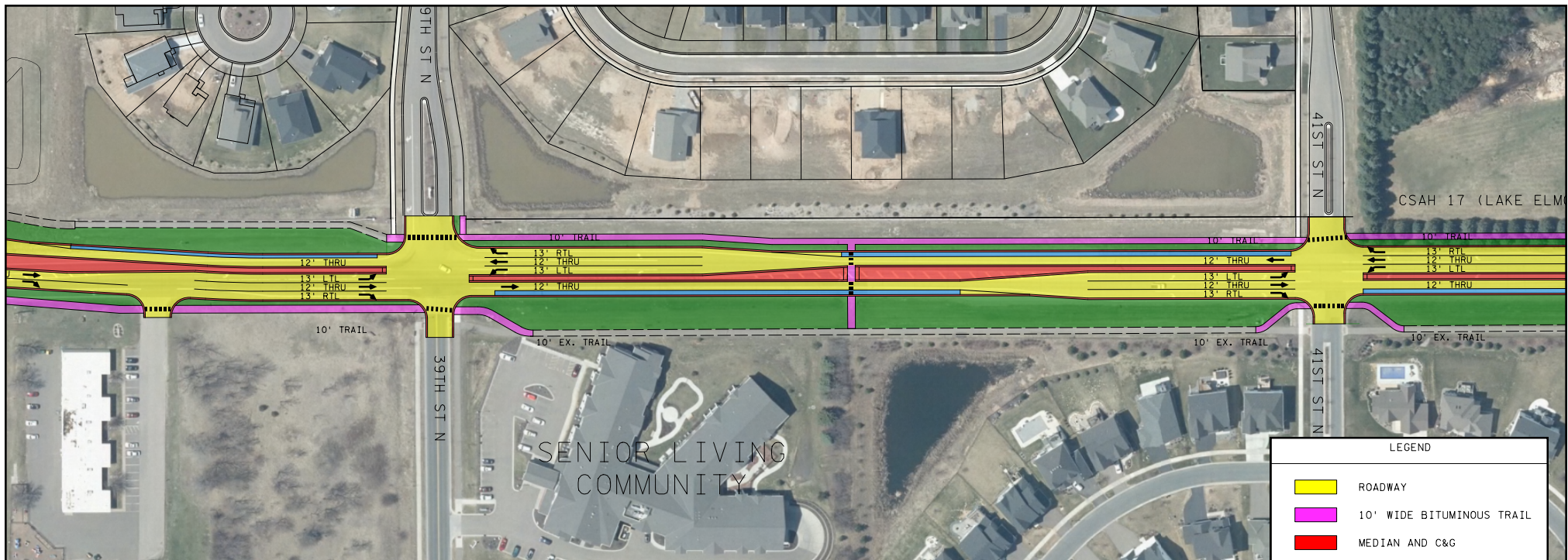














# CSAH 17 Corridor Improvements in Lake Elmo: CSAH 14 to 43rd Street

## Roadway Reconstruction & Modernization



### Project Location

CSAH 17 (Lake Elmo Ave)  
between CSAH 14 (Stillwater  
Blvd) and 43<sup>rd</sup> St in the City of  
Lake Elmo



### Funding Request

Federal: \$7,000,000

Local Match: \$2,222,800 (24.1%)

Project Total: \$9,222,800

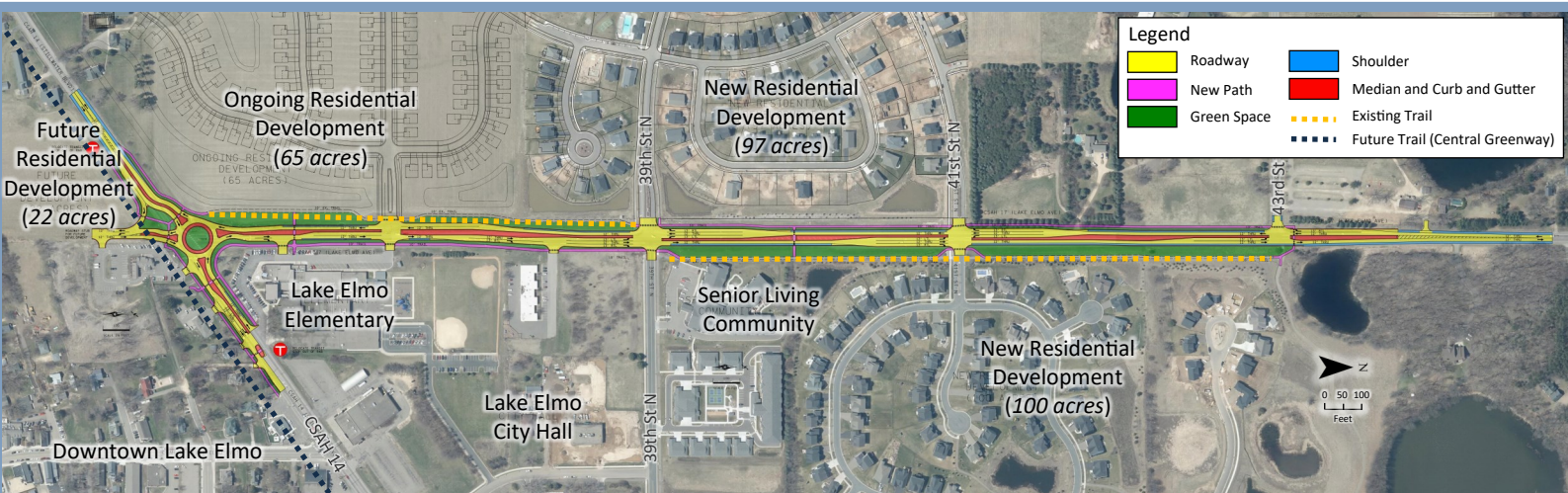
## Project Summary

Lake Elmo is experiencing remarkable growth around the intersection of CSAH 17 and CSAH 14, with over 280 acres of residential development in various states of completion. Additionally, the CSAH 17 corridor supports a senior living facility, elementary school, landmark restaurant, and other commercial uses — and is located just one-quarter mile from downtown Lake Elmo. The current roadway lacks sufficient turn lanes, pedestrian crossings, and off-street trail facilities. The existing signalized intersection at CSAH 14 experiences significant delay, poor geometry, and has the only marked pedestrian crossing on the corridor.

The proposed improvements to CSAH 17 are essential to community growth and will enhance safety, operations, and efficiency for all users. The two travel lanes will be separated with a raised median, contributing to access control and traffic calming. Turn lanes will be added at all intersecting roadways and continuous 10-foot trails will be constructed along both sides of the roadway. Three new marked pedestrian crossings with median refuges will be added at 43rd St and at mid-block locations north of the CSAH 17/CSAH 14 intersection and north of 39th St. In addition, the CSAH 17/CSAH 14 intersection will be reconstructed as a single-lane roundabout for improved traffic operations and accessible, high-visibility pedestrian crossings.

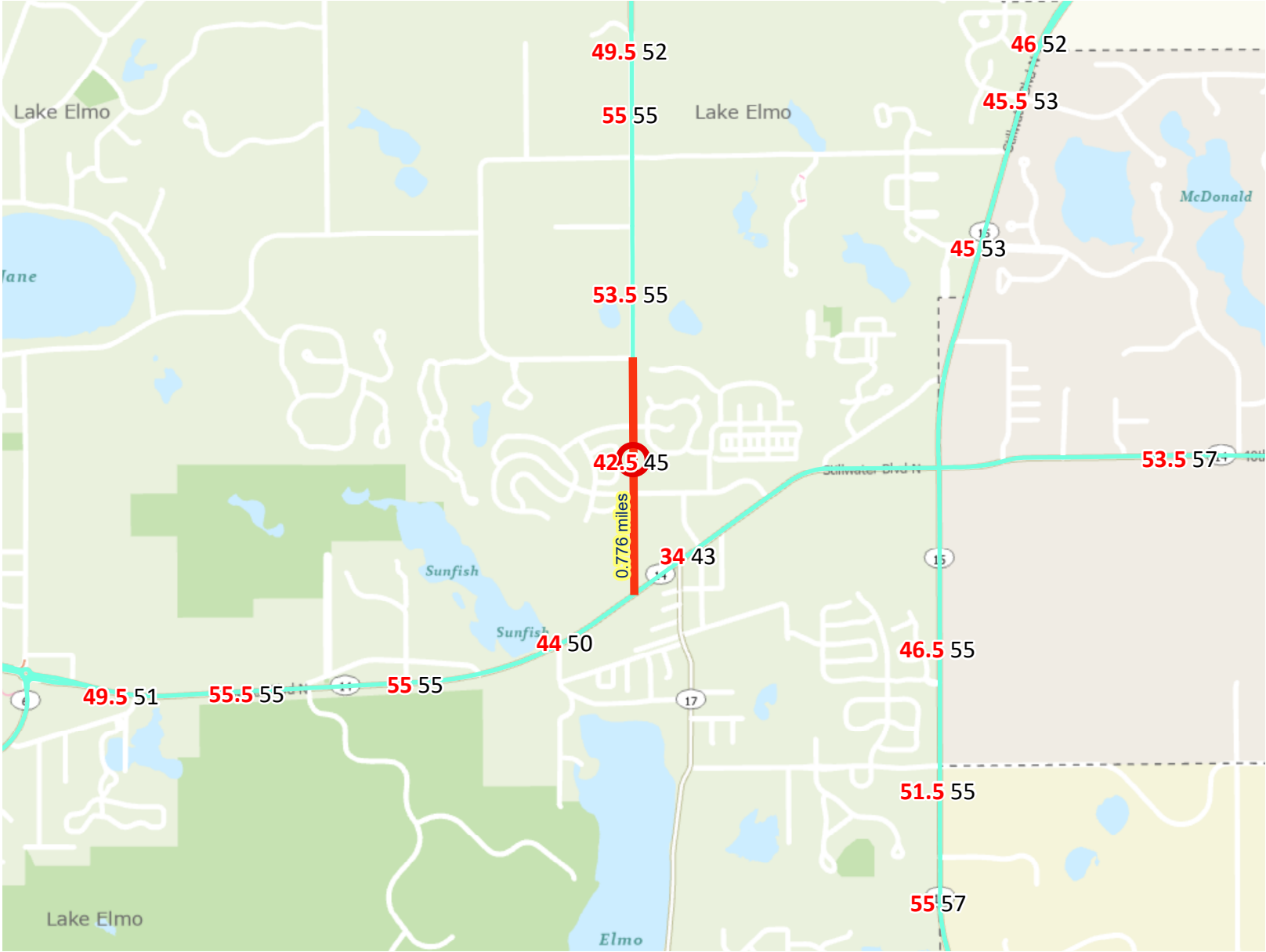
## Summary of Project Benefits

- ⇒ Reconstructs the CSAH 17/CSAH 14 intersection as a single-lane roundabout to increase traffic safety and efficiency and provide high-visibility, ADA-compliant crossings with pedestrian refuges
- ⇒ Completes continuous, off-street, multiuse trails on both sides of the roadway, improving access to transit and allowing community members of all ages and abilities to travel safely and access local destinations without a vehicle
- ⇒ Adds three marked pedestrian crossings with median refuges, reducing crossing distance and allowing for two-stage crossings
- ⇒ Improves vehicle operations and supports access to adjacent residential developments
- ⇒ Connects to the future Lake Elmo Segment of the Central Greenway Regional Trail
- ⇒ Complements planned investment in interchange at CSAH 17 and TH 36 with infrastructure necessary to support local and regional trips



# Level of Congestion

Roadway Reconstruction/Modernization Project: CSAH 17 Corridor Improvements in Lake Elmo: CSAH 14 to 43rd | Map ID: 1698682048



○ Project Points    — Principal Arterials    — Principal Arterials Planned

— Project    — A Minor Arterials    — A Minor Arterials Planned

0 0.3 0.6 1.2 1.8 2.4 Miles

Created: 10/30/2023  
LandscapeRSA1



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



INCIDENT ID	INTERSECTION	SEGMENT	INCLUDE	NOTES	ACCIDENT #	MONTH	DAY	YEAR	DAY OF WEEK	HOUR	SEVERITY	MANNER OF COLLISION	COLLISION - ALLIANT	LIGHTING	WEATHER 1	WEATHER 2	SURFACE	UTM X	UTM Y	LATITUDE	LONGITUDE	DATE & TIME	STATUS	COLLISION DIAGRAM
901369	INT 1	YES		distracted run off road	211080048	4	18	2021	Sun	20	B	-	Run Off Road	Dark (Str Lights On)	Rain	-	Wet	509200.2747	4983025.805	45.00062716	-92.88327429	2021/04/18-20:07	Accepted	2021/04/18-20:07-DI-R-W
1063698	INT 1	YES		snow plow RT	223410094	12	7	2022	Wed	11	PDO	Sideswipe - Same Direction	Sideswipe	Daylight	Clear	-	Snow	509199.9848	4983025.594	45.00062525	-92.88327797	2022/12/07-11:40	Accepted	2022/12/07-11:40-L-C-5



Home > CMF / CRF Details

CMF / CRF DETAILS

CMF ID: 4264

CONVERT SIGNALIZED INTERSECTION TO MODERN ROUNDABOUT

DESCRIPTION:

PRIOR CONDITION: SIGNALIZED INTERSECTION

CATEGORY: INTERSECTION GEOMETRY

STUDY: EVALUATION OF SAFETY STRATEGIES AT SIGNALIZED INTERSECTIONS, SRINIVASAN, ET AL., 2011

Star Quality Rating: [VIEW SCORE DETAILS]

Rating Points Total: 120

Crash Modification Factor (CMF)

Value: 0.759

Adjusted Standard Error:

Unadjusted Standard Error: 0.052

Crash Reduction Factor (CRF)

Value: 24.1 (This value indicates a **decrease** in crashes)

Adjusted Standard Error:

Unadjusted Standard Error: 5.2

Applicability

Crash Type: All

Crash Severity: All

Roadway Types: Not specified

Street Type:

Minimum Number of Lanes: 1

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:	Urban and suburban
Traffic Volume:	
Average Traffic Volume:	
Time of Day:	Not specified
<i>If countermeasure is intersection-based</i>	
Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	4-leg
Traffic Control:	Roundabout
Major Road Traffic Volume:	Minimum of 5322 to Maximum of 43123 Annual Average Daily Traffic (AADT)
Minor Road Traffic Volume:	
Average Major Road Volume :	18529 Annual Average Daily Traffic (AADT)
Average Minor Road Volume :	
<b>Development Details</b>	
Date Range of Data Used:	1999 to 2009
Municipality:	
State:	CO,FL,IN,MD,MI,NY,NC,SC,VT,WA
Country:	USA
Type of Methodology Used:	Before/after using empirical Bayes or full Bayes
Sample Size (sites):	22 sites after
<b>Other Details</b>	
Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	Dec 06, 2012
Comments:	Countermeasure name has been slightly modified for consistency across Clearinghouse

[VIEW THE FULL STUDY DATA](#)
[EXPORT DETAIL PAGE AS PDF](#)

BOARD OF COUNTY COMMISSIONERS  
WASHINGTON COUNTY, MINNESOTARESOLUTION NO. 2023-141DATE November 28, 2023

DEPARTMENT

Public Works

MOTION

SECONDED BY

BY COMMISSIONER Karwoski

COMMISSIONER

Clasen

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**RESOLUTION AUTHORIZING SUBMITTAL OF APPLICATIONS TO THE  
METROPOLITAN COUNCIL FOR FUNDING UNDER THE  
2024 REGIONAL SOLICITATION PROGRAM**

**WHEREAS**, the Regional Solicitation process started with the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991; and

**WHEREAS**, as authorized by the most recent federal surface transportation funding act, FAST ACT, projects will be selected for funding as part of three federal programs: Surface Transportation Program (STP), Congestion Mitigation and Air Quality Improvement (CMAQ) Program, and Transportation Alternatives Program (TAP); and

**WHEREAS**, pursuant to the Regional Solicitation and the regulations promulgated thereunder, eligible project sponsors wishing to receive federal grants for a project shall submit an application first with the appropriate metropolitan planning organization (MPO) for review and inclusion in the MPO's Transportation Improvement Program (TIP); and

**WHEREAS**, the Metropolitan Council and the Transportation Advisory Board (TAB) act as the MPO for the seven county Twin Cities region and have released the Regional Solicitation for federal transportation funds for 2028 and 2029; and

**WHEREAS**, Washington County is an eligible project sponsor for Regional Solicitation funds; and

**WHEREAS**, Washington County is proposing to submit grant applications to Metropolitan Council as part of the 2024 Regional Solicitation for the following projects:

1. CSAH 15/Manning Avenue Corridor Improvements: CSAH 14 to Stillwater High School (Strategic Capacity)
2. CSAH 16/Valley Creek Road and Settlers Ridge Parkway Intersection in Woodbury (Spot Mobility)
3. CSAH 17 Corridor Improvements in Lake Elmo: CSAH 14 to 43rd St. (Roadway Reconstruction and Modernization)
4. Highway 61 and County Road 50 Intersection in Forest Lake (Spot Mobility)
5. Hardwood Creek Trail Extension in Hugo (Multiuse Trail and Bike Facilities)
6. Traffic Signal Battery Backup Systems in the Cities of Lake Elmo, Oakdale, and Woodbury (Traffic Management Technology)
7. Electric Vehicle (EV) Carshare at Suburban METRO Gold Line BRT Stations (Unique Projects Category); and

**WHEREAS,** the projects will be of mutual benefit to the Metropolitan Council, Washington County, and the Cities and Townships of Baytown, Forest Lake, Hugo, Lake Elmo, Oakdale, Oak Park Heights, St Paul, and Woodbury; and

**WHEREAS,** Washington County is committed to providing the county share of the costs if the projects are selected as part of the 2024 Regional Solicitation; and

**WHEREAS,** Washington County is committed to completing the project, if selected, and funding is provided as part of the 2024 Regional Solicitation.

**NOW, THEREFORE, BE IT RESOLVED,** that Washington County is requesting funding from the federal government through the Metropolitan Council’s 2024 Regional Solicitation and the county is committed to completing the projects identified above and providing the county share of funding.

ATTEST:

*Kevin Corbid*

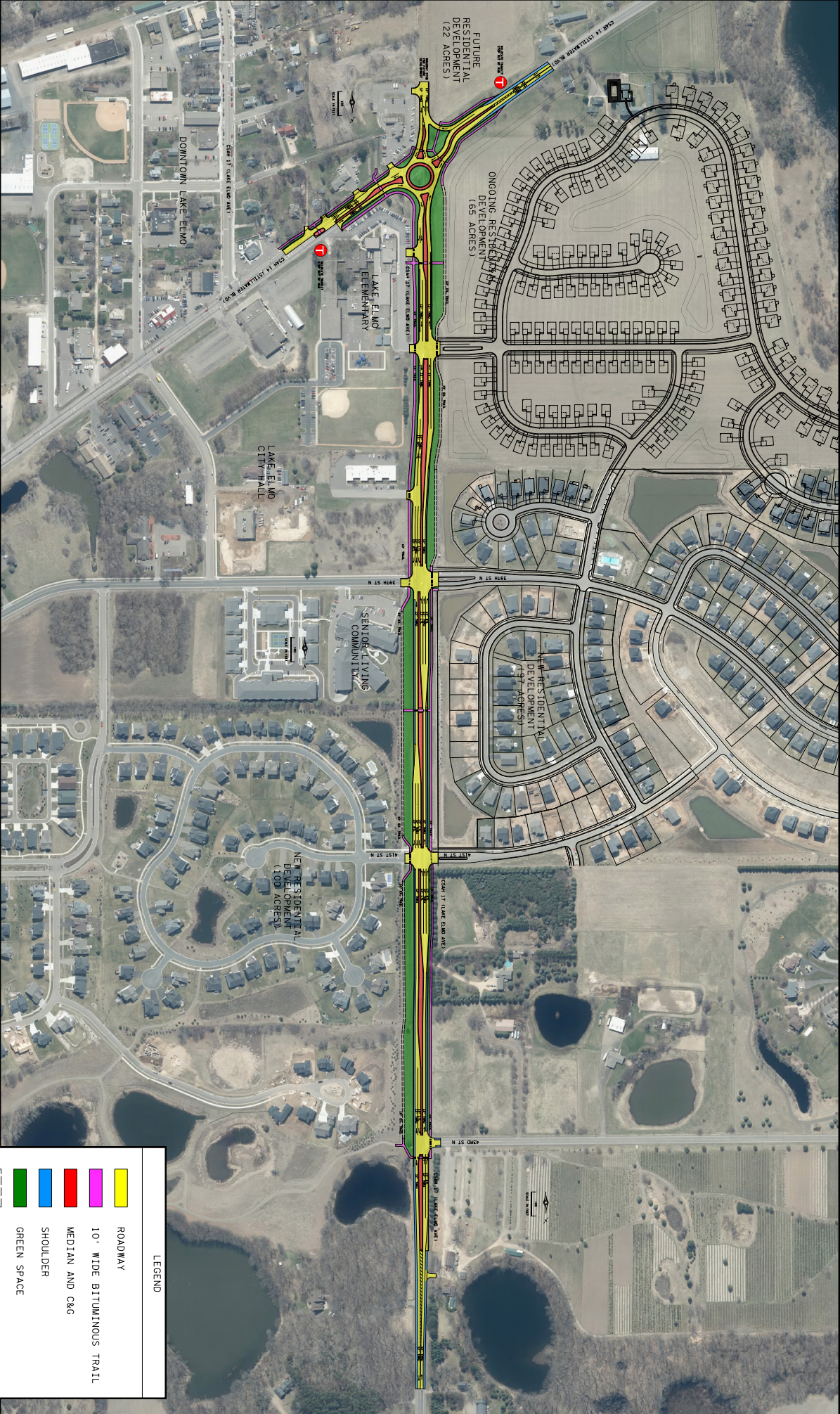
COUNTY ADMINISTRATOR

*Gary Kriesel*

COUNTY BOARD CHAIR

	YES	NO
MIRON	<u>X</u>	_____
KARWOSKI	<u>X</u>	_____
KRIESEL	<u>X</u>	_____
BIGHAM	<u>X</u>	_____
CLASEN	<u>X</u>	_____





ROADWAY

10' WIDE BITUMINOUS TRAIL

MEDIAN AND C&G

SHOULDER

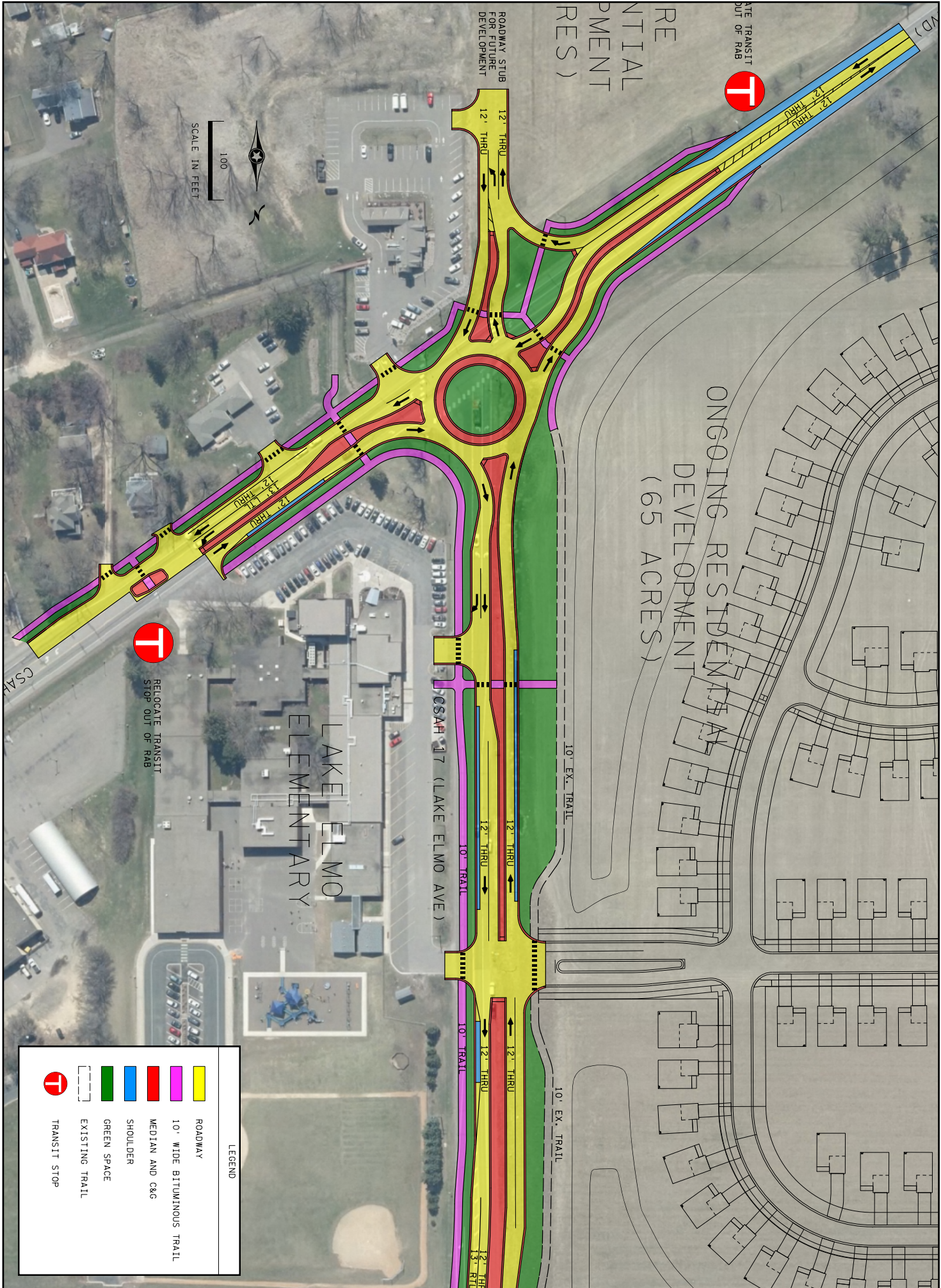
GREEN SPACE

EXISTING TRAIL

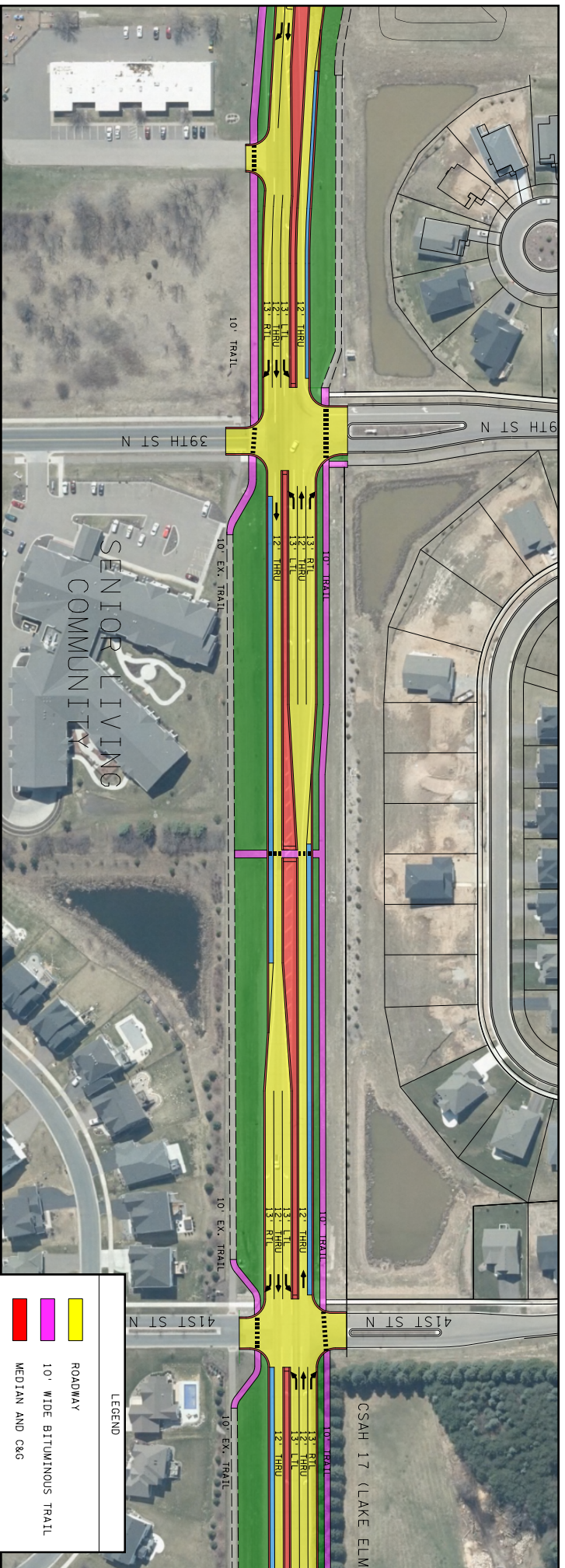
TRANSIT STOP

LEGEND










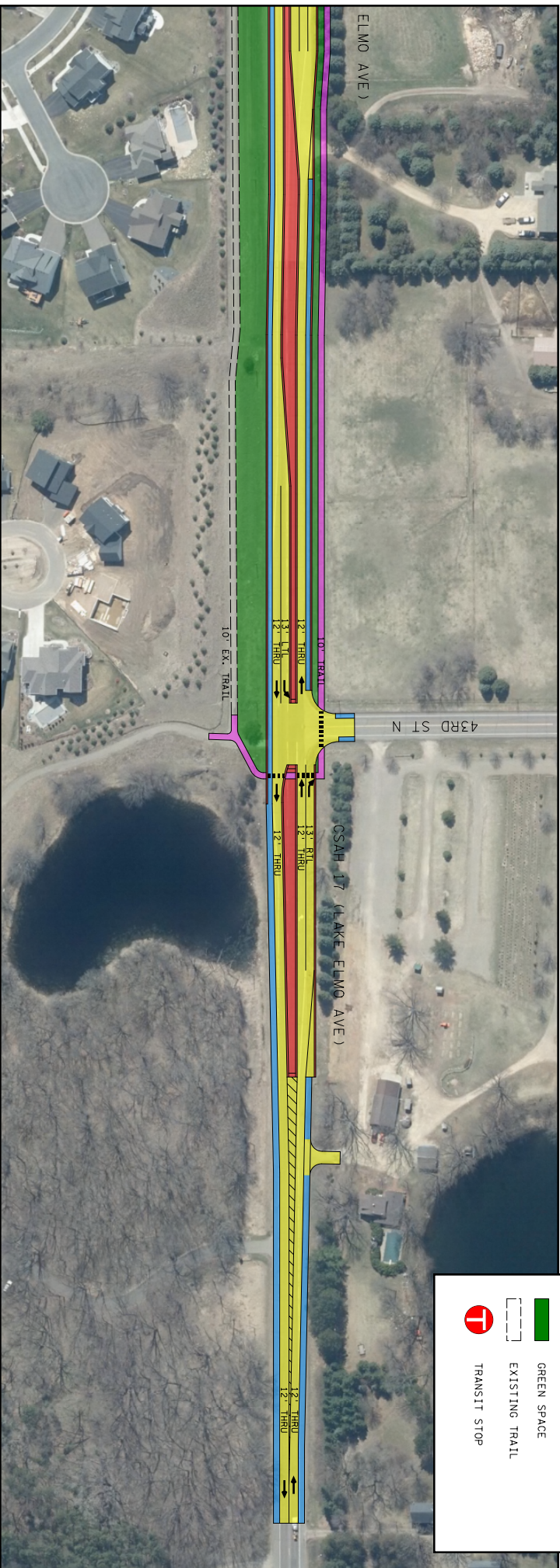




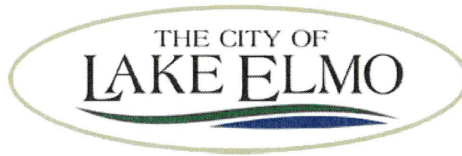


**LEGEND**

	ROADWAY
	10' WIDE BITUMINOUS TRAIL
	MEDIAN AND C&G
	SHOULDER
	GREEN SPACE
	EXISTING TRAIL
	TRANSIT STOP







November 27, 2023

Wayne Sandberg  
Public Works Director/County Engineer  
Washington County Public Works  
11660 Myeron Road  
Stillwater, MN 55082

**RE: Support for Washington County's Regional Solicitation application for Roadway Reconstruction & Modernization on CSAH 17 in the City of Lake Elmo.**

Dear Mr. Sandberg,

The purpose of this letter is to express the City of Lake Elmo's support for Washington County's 2024 solicitation of federal funds through the Metropolitan Council's Regional Solicitation Program for Roadway Reconstruction & Modernization on County State Aid Highway (CSAH) 17 from CSAH 14 to 43rd Avenue.

The proposed project includes reconstruction of CSAH 17 to a two-lane divided roadway with access and turn-lane improvements, intersection improvements at CSAH 14, trail construction, and improved pedestrian crossings at key locations. This project aligns with the ongoing growth and development in the City of Lake Elmo by supporting safe and reliable traffic operations and bicycle/pedestrian connectivity.

The proposed project also aligns with the planned interchange at CSAH 17 and Highway 36 to the north. With the proposed interchange project and the improvements proposed as part of this Regional Solicitation application; access, operations, mobility and safety will be improved along CSAH 17 corridor.

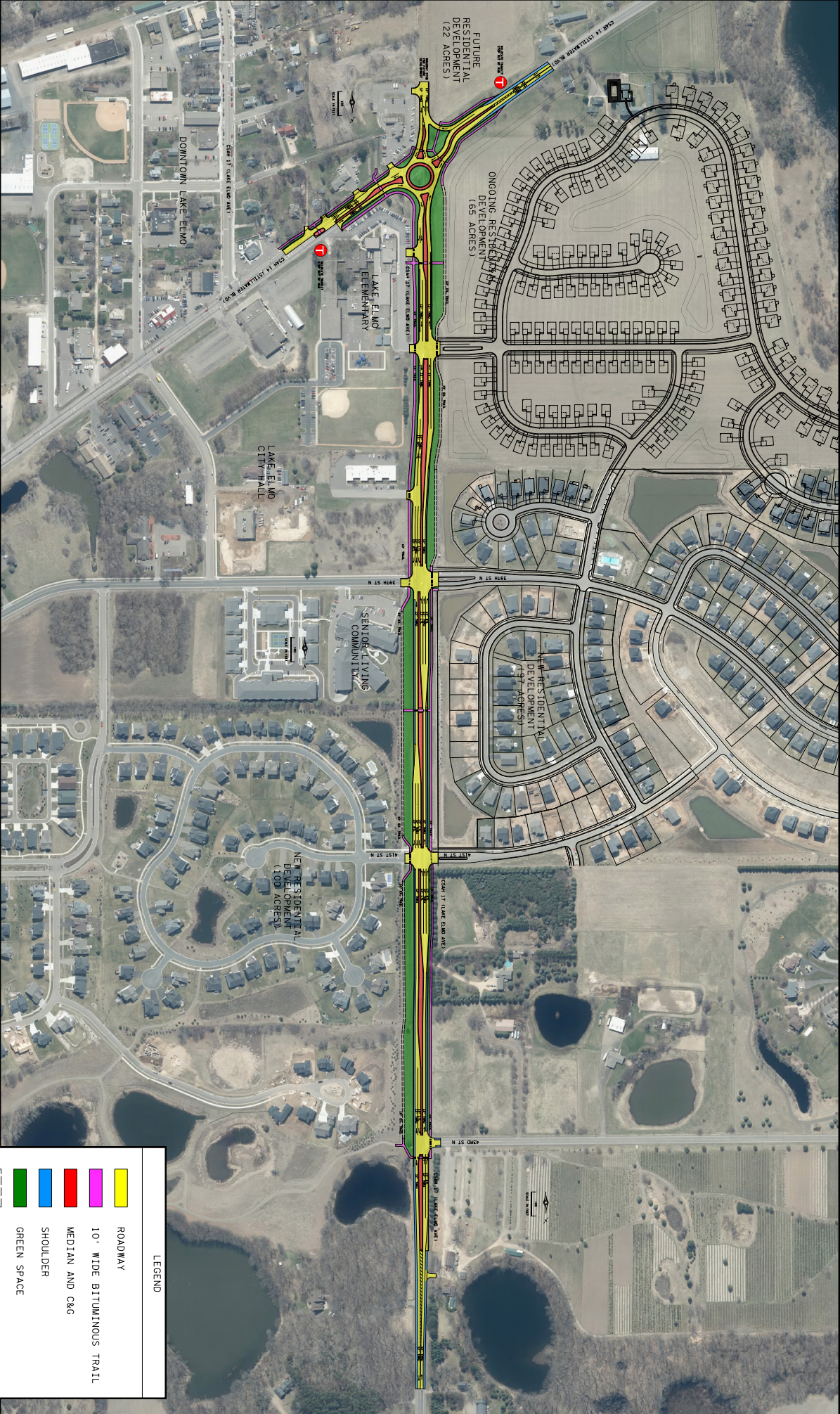
Thank you for your consideration. If you have any questions, please contact me at 651-300-9641 or at [CCadenhead@lakeelmo.org](mailto:CCadenhead@lakeelmo.org).

Sincerely,

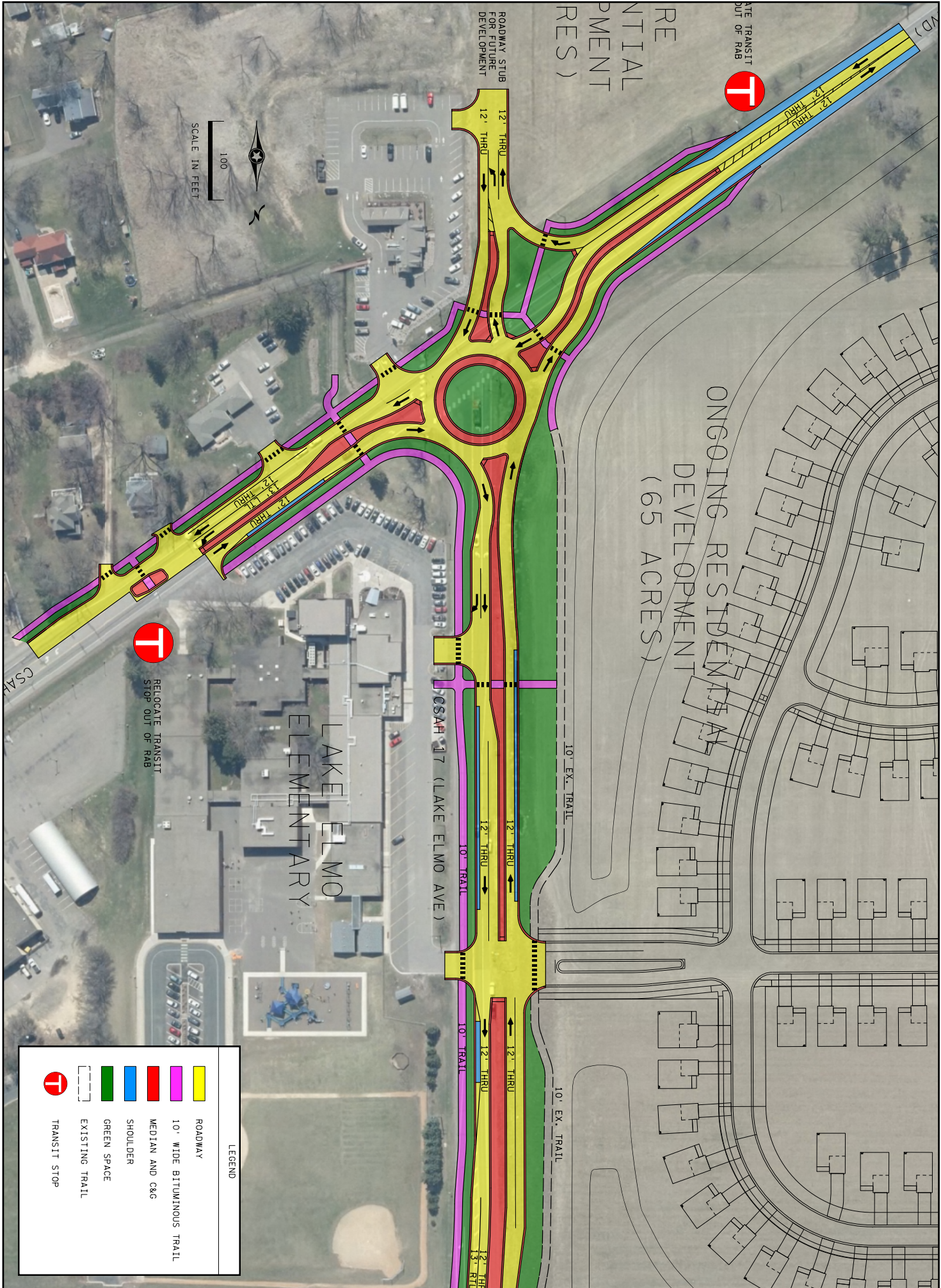
Charles Cadenhead  
Mayor

cc: Marty Powers, Public Works Director  
Jack Griffin, PE, City Engineer

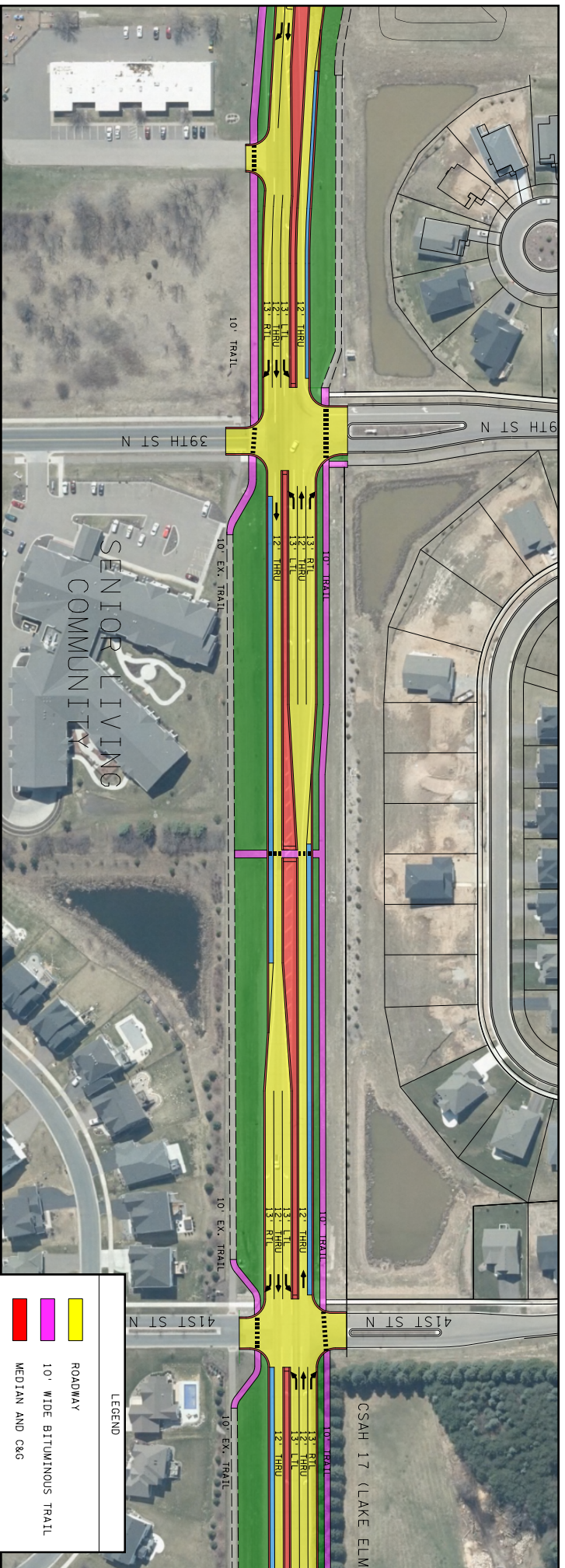






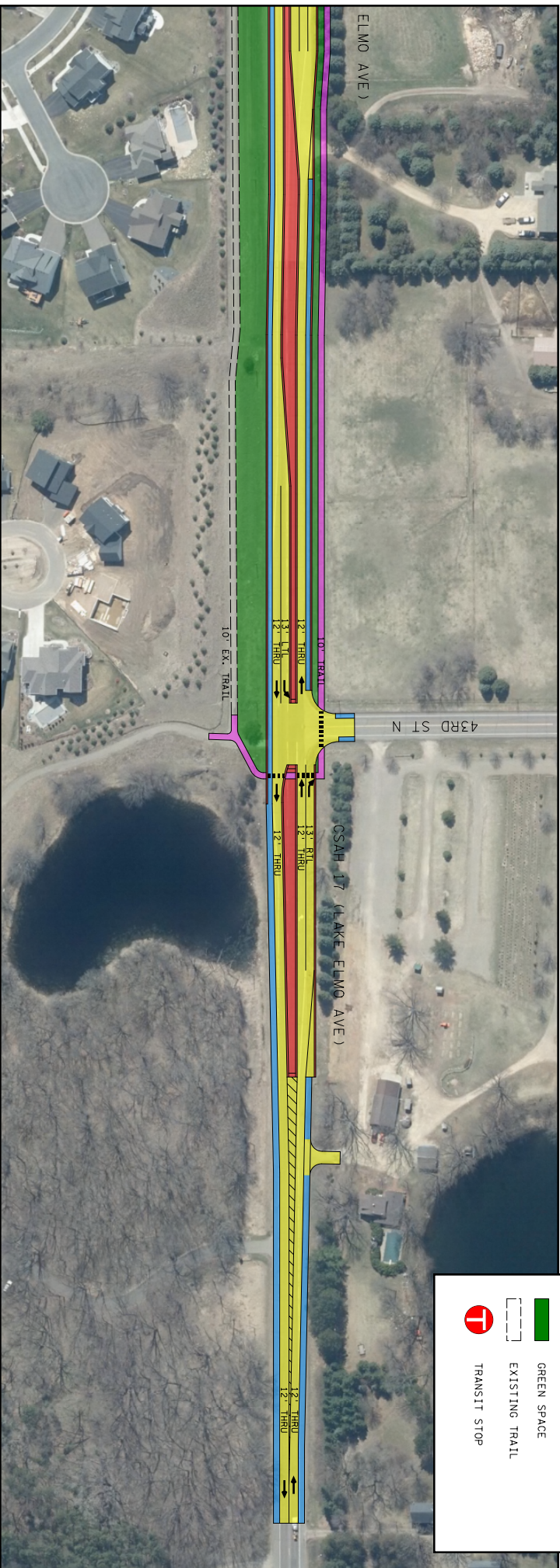






**LEGEND**

	ROADWAY
	10' WIDE BITUMINOUS TRAIL
	MEDIAN AND C&G
	SHOULDER
	GREEN SPACE
	EXISTING TRAIL
	TRANSIT STOP





# CSAH 17 Improvements in Lake Elmo

Roadway Reconstruction and Modernization

## Existing Conditions Photographs



Image 1: Aerial view – Intersection of CSAH 17 and CSAH 14



Image 2: Westbound on CSAH 14 (Stillwater Blvd) at CSAH 17 (Lake Elmo Ave)



Image 3: Eastbound on CSAH 14 (Stillwater Blvd) at CSAH 17 (Lake Elmo Ave)





Image 4: Southbound on CSAH 17 (Lake Elmo Ave) at CSAH 14 (Stillwater Blvd)



Image 5: Eastbound on 43<sup>rd</sup> St N at CSAH 17 (Lake Elmo Ave)



Image 6: Looking south on CSAH 17 (Lake Elmo Ave) at 43<sup>rd</sup> St N



Image 7: Southbound on CSAH 17 (Lake Elmo Ave) at 41<sup>st</sup> St N





Image 8: Southbound on CSAH 17 (Lake Elmo Ave) at 39<sup>st</sup> St N