



Application

13860 - 2020 Roadway Expansion

14347 - Highway 5 Arboretum Area Mobility and Access Improvement

Regional Solicitation - Roadways Including Multimodal Elements

Status: Submitted
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Primary Contact

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

Organization Information

Name: CARVER COUNTY

Jurisdictional Agency (if different):

Organization Type:

County Government

Organization Website:

Address:

PUBLIC WORKS

11360 HWY 212 W #1

*

COLOGNE

Minnesota

55322-9133

City

State/Province

Postal Code/Zip

County:

Carver

Phone:*

Ext.

Fax:

PeopleSoft Vendor Number

0000026790A12

Project Information

Project Name

Highway 5 Arboretum Area Mobility and Access Improvement Project

Primary County where the Project is Located

Carver

Cities or Townships where the Project is Located:

Chanhassen, Victoria

Jurisdictional Agency (If Different than the Applicant):

MnDOT

TH 5 is a congested (28,500 vehicles/day) 2-lane undivided A-Minor Expander road. The project segment has a critical crash index nearly 3 times the statewide average. During peak periods and/or Minnesota Landscape Arboretum events, traffic backs up several miles. Turning onto Hwy 5 is difficult at times due to speeds and limited gaps, resulting in motorists making risky decisions. This project includes strategic highway expansion (2- to 4-lane conversion) near the Arboretum, relocation of the Arboretum access, a new traffic signal at Minnewashta Pkwy, regional trail expansion and a grade separated pedestrian crossing. These changes will alleviate congestion, improve access to the Arboretum and neighborhoods, improve safety, and knit together a regional trail network.

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

The project will improve the safety of Highway 5 and alleviate congestion issues. It includes new trails linking to existing facilities, augmented at-grade pedestrian crossings and a new underpass linking the south side of Victoria to the local and regional trail network. The new signal at Minnewashta Pkwy will enable reconfiguration of the main Arboretum entrance to this location which will benefit access for visitors and employees. The Arboretum currently welcomes half a million visitors annually and has plans to significantly grow visitation. The change to the CSAH 13 signal will alleviate a documented safety problem identified in MnDOT's Congestion Management and Safety Plan. This intersection is costly, with annual total congestion, reliability and crash costs calculated at \$729,800.

This project is the culmination of the past 15 months of collaboration through a full corridor study process called the Arboretum Area Transportation Plan, with many stakeholder groups and extensive

public engagement, working closely with the Arboretum and University of Minnesota. Project partners include MnDOT, Carver County, the Cities of Chanhassen, Chaska, and Victoria, as well as the Arboretum. This project has risen to the top of priorities for the project partners based on need, support, and the impact this will have on safety and performance to the Highway 5 corridor. This project has the full support of all partners noted above.

(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.](#)

TH 5 (ARBORETUM BLVD) IN VICTORIA AND CHANHASSEN FR PARK DR TO ARBORETUM DR. 4-LANE SECTION MINNEWASHTA TO W, SIGNAL/SIGNAL UPGRADE, MEDIAN CHANNELIZATION AT SIGNALS, BIKE TRAILS TH 5/SIDE STS, ADA, PED UNDERPASS, RT OUT AT ARBORETUM DR, NOISE WALLS

Project Length (Miles)

1.9

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 \$10,000,000.00

Match Amount \$3,440,000.00

Minimum of 20% of project total

Project Total \$13,440,000.00

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

Match Percentage 25.6%

Minimum of 20%

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

Source of Match Funds Carver County, City of Victoria, City of Chanhassen

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: 2025

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

Additional Program Years: 2023

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

Project Information-Roadways

County, City, or Lead Agency	Carver County
Functional Class of Road	A-Minor Arterial Expander
Road System	TH
<i>TH, CSAH, MSAS, CO. RD., TWP. RD., CITY STREET</i>	
Road/Route No.	5
<i>i.e., 53 for CSAH 53</i>	
Name of Road	Arboretum Blvd
<i>Example; 1st ST., MAIN AVE</i>	
Zip Code where Majority of Work is Being Performed	55318
(Approximate) Begin Construction Date	04/01/2025
(Approximate) End Construction Date	11/28/2025
TERMINI:(Termini listed must be within 0.3 miles of any work)	
From: (Intersection or Address)	Crimson Bay Rd
To: (Intersection or Address)	Park Dr/Kochia Ln
<i>DO NOT INCLUDE LEGAL DESCRIPTION</i>	
Or At	
Miles of Sidewalk (nearest 0.1 miles)	0
Miles of Trail (nearest 0.1 miles)	1.5
Miles of Trail on the Regional Bicycle Transportation Network (nearest 0.1 miles)	0.9
Primary Types of Work	Grade, Agg Base, Bit Base, Bit Surf, Concrete Median, Sidewalk, Signal, Lighting, Guardrail, Bike Path, Ped Ramps, Underpass, Retaining / Noise Walls
<i>Examples: GRADE, AGG BASE, BIT BASE, BIT SURF, SIDEWALK, CURB AND GUTTER,STORM SEWER, SIGNALS, LIGHTING, GUARDRAIL, BIKE PATH, PED RAMPS, BRIDGE, PARK AND RIDE, ETC.</i>	
BRIDGE/CULVERT PROJECTS (IF APPLICABLE)	
Old Bridge/Culvert No.:	NA
New Bridge/Culvert No.:	TBD (Ped Underpass)
Structure is Over/Under (Bridge or culvert name):	Under TH 5

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.

Goal A: Transportation System Stewardship.

Objective B: Operate the regional transportation system efficiently and cost-effectively.

Strategy A1. (Pp. 2.2-2.4)

Goal B: Safety & Security.

Objective A: Reduce fatal and serious injury crashes and improve safety and security.

Strategies B1, B3, B4, B6. (Pp. 2.5-2.8).

Goal C: Access to Destinations.

Objective A: Increase availability of multimodal travel options.

Objective B: Increase reliability and predictability for travel.

Objective D: Increase number and share of trips by transit, carpools, bicycling, and walking.

Objective E: Improve availability and quality of multimodal travel options for people of all ages and abilities.

Strategies C1, C2, C3, C9, C10, C15, C16, C17.
(Pp. 2.9-2.24)

Goal D: Competitive Economy.

Objective B: Invest in multimodal transportation system.

Objective C: Support economic competitiveness through efficient freight movement.

Strategies D1, D3. (Pp.2.26-2.28)

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

Goal E: Healthy and Equitable Communities.

Objective A: Reduce transportation-related air emissions.

Objective C: Increase availability/attractiveness of transit, bicycling, and walking to encourage active transportation.

Objective D: A transportation system that promotes community cohesion and connectivity for people of all ages and abilities.

Strategies E1, E2, E3, E6. (Pp 2.30-2.34)

Goal F: Leveraging Transportation Investments to Guide Land Use.

Objective C: Encourage land use design that integrates highways, streets, transit, walking, and bicycling.

Strategies F1, F5, F6. (Pp. 2.35-2.38)

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.

City of Victoria Comprehensive Plan

Survey identified widening of TH 5 between TH 41 and CSAH 13 as the highest priority major roadway improvement in the city (P. 98).

Identifies Policy T-2.1 to cooperate with others on improvements to TH 5. Goal T-8 (Facilitate Bike and Ped Travel) includes 14 policies for these modes (Pp. 103-104).

Noted traffic deficiencies on TH 5 in the proposed project area (P. 116) and forecast future deficiencies (P. 122). TH 5/CSAH 13 identified as the top crash location in Victoria; TH 5/Minnewashta Pkwy ranked 8th (P. 124).

List the applicable documents and pages:

Identifies TH 5 corridor as a key concern; acute congestion will get worse. Notes Victoria's role in the TH 5 Corridor Study (P. 143). TH 5 upgrades and bike/ped access identified as the top priority for Victoria's implementation program (P. 144).

Identifies greenway opportunities, including Madelyn Creek across TH 5. The greenway system should include link to the Minnesota Landscape Arboretum and other area amenities (Pp. 40-41).

References planned TH 5 Regional Trail, connecting to Lake Minnetonka LRT Trail (P. 80). Shown as a planned facility in Figure 7.1: Existing Parks and Trails (P. 82).

Goal PROS-4 - develop a trail system. Policy PROS-4.2 - connect city trails to regional trails (P.

86). Policy PROS-4.6 - grade-separation for trail crossings of major roadways (P. 89). Policy T.8-5 - need for a grade-separated bike/ped crossing of TH 5 (P. 103). Policy PROS-7.2 - trail connections from neighborhoods to regional trails, parks and facilities (P. 92), including an action item for trail connections to Carver Park Reserve and the MN Landscape Arboretum.

High priority trail gap noted for Bavaria Rd S of TH 5 in Figure 7.3: Trail Gaps (P. 88).

City of Chanhassen Comprehensive Plan (Adopted February 2020)

Identifies capacity issues on TH 5 (P. 115). Notes need for Chanhassen to partner with other agencies to plan improvements and identify funding (P. 117), and that Carver County Transportation Plan shows a need for a 4-lane highway W of TH 41 (P. 129).

Notes completed improvements at Minnewashta Pkwy and a ped underpass of TH 5 in 2012. Describes that a traffic signal and turn lanes are needed in the future. Recommends elimination of left turns at TH 5/Crimson Bay Rd (Arboretum entrance, P. 116).

Acknowledges TH 5 RBTN Tier-1 alignment, including the segment adjacent to the Minnesota Landscape Arboretum to Park Dr and beyond (P. 90); shown in the Trail Initiatives Map (Figure 5-7, P. 102) and identified as a trail gap.

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

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

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

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

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

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

7. The requested funding amount must be more than or equal to the minimum award and less than or equal to the maximum award. The cost of preparing a project for funding authorization can be substantial. For that reason, minimum federal amounts apply. Other federal funds may be combined with the requested funds for projects exceeding the maximum award, but the source(s) must be identified in the application. Funding amounts by application category are listed below.

Strategic Capacity (Roadway Expansion): \$1,000,000 to \$10,000,000

Roadway Reconstruction/Modernization: \$1,000,000 to \$7,000,000

Traffic Management Technologies (Roadway System Management): \$250,000 to \$3,500,000

Spot Mobility and Safety: \$1,000,000 to \$3,500,000

Bridges Rehabilitation/Replacement: \$1,000,000 to \$7,000,000

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

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

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

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

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

Date plan completed: 02/18/2014

Link to plan: <https://www.co.carver.mn.us/home/showdocument?id=1164>

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

Date self-evaluation completed:

Link to plan:

Upload plan or self-evaluation if there is no link

Upload as PDF

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

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

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

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

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

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

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

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

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

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

Roadways Including Multimodal Elements

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

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

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

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

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

Bridge Rehabilitation/Replacement and Strategic Capacity projects only:

3. Projects requiring a grade-separated crossing of a principal arterial freeway must be limited to the federal share of those project costs identified as local (non-MnDOT) cost responsibility using 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 bridge must equal or exceed 20 feet.

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

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

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

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

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

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

Requirements - Roadways Including Multimodal Elements

Specific Roadway Elements

CONSTRUCTION PROJECT ELEMENTS/COST ESTIMATES	Cost
Mobilization (approx. 5% of total cost)	\$415,000.00
Removals (approx. 5% of total cost)	\$415,000.00
Roadway (grading, borrow, etc.)	\$920,000.00
Roadway (aggregates and paving)	\$2,300,000.00
Subgrade Correction (muck)	\$0.00
Storm Sewer	\$750,000.00
Ponds	\$80,000.00
Concrete Items (curb & gutter, sidewalks, median barriers)	\$850,000.00
Traffic Control	\$400,000.00
Striping	\$100,000.00
Signing	\$100,000.00
Lighting	\$50,000.00
Turf - Erosion & Landscaping	\$500,000.00
Bridge	\$200,000.00
Retaining Walls	\$2,350,000.00
Noise Wall (not calculated in cost effectiveness measure)	\$1,200,000.00
Traffic Signals	\$660,000.00
Wetland Mitigation	\$50,000.00
Other Natural and Cultural Resource Protection	\$0.00
RR Crossing	\$0.00
Roadway Contingencies	\$1,600,000.00
Other Roadway Elements	\$0.00
Totals	\$12,940,000.00

Specific Bicycle and Pedestrian Elements

CONSTRUCTION PROJECT ELEMENTS/COST ESTIMATES	Cost
--	------

Path/Trail Construction	\$320,000.00
Sidewalk Construction	\$0.00
On-Street Bicycle Facility Construction	\$0.00
Right-of-Way	\$0.00
Pedestrian Curb Ramps (ADA)	\$30,000.00
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	\$0.00
Other Bicycle and Pedestrian Elements	\$150,000.00
Totals	\$500,000.00

Specific Transit and TDM Elements

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

Transit Operating Costs

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

Totals

Total Cost	\$13,440,000.00
Construction Cost Total	\$13,440,000.00
Transit Operating Cost Total	\$0.00

Congestion within Project Area:

The measure will analyze the level of congestion within the project area. Council staff will provide travel speed data on the "Level of Congestion" map. The analysis will compare the peak hour travel speed within the project area to free-flow conditions.

Free-Flow Travel Speed:	42
Peak Hour Travel Speed:	25
Percentage Decrease in Travel Speed in Peak Hour compared to Free-Flow:	40.48%
Upload Level of Congestion map:	1589554258044_TH5_Arb_Level of Congestion Map.pdf

Congestion on adjacent Parallel Routes:

Adjacent Parallel Corridor	TH 7
Adjacent Parallel Corridor Start and End Points:	
Start Point:	Rolling Acres Rd (CSAH 13)
End Point:	TH 41
Free-Flow Travel Speed:	57
<i>The Free-Flow Travel Speed is black number.</i>	
Peak Hour Travel Speed:	16
<i>The Peak Hour Travel Speed is red number.</i>	
Percentage Decrease in Travel Speed in Peak Hour Compared to Free-Flow:	71.93%
Upload Level of Congestion Map:	1589554258044_TH5_Arb_Level of Congestion Map.pdf

Principal Arterial Intersection Conversion Study:

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

(80 Points)

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

(60 Points)

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

(50 Points)

Proposed interchange project that reduces delay at a Medium Priority Intersection:

(40 Points)

Proposed interchange project that reduces delay at a Low Priority Intersection:

(0 Points)

Not listed as a priority in the study: Yes

(0 Points)

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

Existing Employment within 1 Mile: 2094

Existing Manufacturing/Distribution-Related Employment within 1 Mile: 866

Existing Post-Secondary Students within 1 Mile: 0

Upload Map 1589554323602_TH5_Arb_Regional Economy Map.pdf

Please upload attachment in PDF form.

Measure C: Current Heavy Commercial Traffic

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

Along Tier 1:

Miles: 0

(to the nearest 0.1 miles)

Along Tier 2: Yes

Miles: 1.4

(to the nearest 0.1 miles)

Along Tier 3:

Miles: 0

(to the nearest 0.1 miles)

The project provides a direct and immediate connection (i.e., intersects) with either a Tier 1, Tier 2, or Tier 3 corridor:

None of the tiers:

Measure A: Current Daily Person Throughput

Location TH 5 between Park Dr / Kochia Ln and Crimson Bay Rd

Current AADT Volume 27500

Existing Transit Routes on the Project N/A

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

Upload Transit Connections Map 1589554544714_TH5_Arb_Transit Connections Map.pdf

Please upload attachment in PDF form.

Response: Current Daily Person Throughput

Average Annual Daily Transit Ridership	0
Current Daily Person Throughput	35750.0

Measure B: 2040 Forecast ADT

Use Metropolitan Council model to determine forecast (2040) ADT volume

No

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

Carver County 2040 Model

Forecast (2040) ADT volume

34500

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

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

Response:

The project serves low-income, disabled, youth, and elderly populations through targeted programs at the Arboretum and everyday use of TH 5. A corridor study led by Carver County and MnDOT (Arboretum Area Transportation Plan) is nearing completion and included a multifaceted engagement plan. Efforts to reach equity populations focused on neighborhood-specific and general public meetings, which were held at the Arboretum. Participants received free Arboretum access for attending (\$15 value per adult). This incentive helped generate wide participation in corridor issue identification and concept development/evaluation. Over 400 people attended these interactive in-person events (dates: 6/19/19, 6/25/19, 6/27/19, 7/16/19, 11/6/19, 11/20/19, 12/4/19, 12/17/19, 3/11/20, plus many more upcoming meetings in 2020 as the study nears conclusion). The project team also held a community pop-up event at the Victoria Classic Car Night on September 4, 2019. Seniors and children provided many comments about the need for the project.

Concept development was directly influenced by feedback regarding access and delay issues, particularly safe access onto and off of TH 5 from Minnewashta Pkwy and at the Arboretum entrance. The project included other means of public input such as online surveys and a web-based mapping interface. These allowed all persons to provide feedback at any time of day, making the planning process more accessible to families with children and seniors. More than 300 online surveys were completed with 100+ comments on the interactive map. Specific outreach to students at the Arboretum through their school programming was planned for March, but was postponed due to the COVID-19 health emergency.

Background on Arboretum programming provides an understanding of how this project serves social equity populations, as most of the land adjacent to the project is owned by the University of MN for the MN Landscape Arboretum. Arboretum programming includes extensive youth programming to a diverse array of students and free membership for households eligible for social assistance in Carver County. The Arboretum welcomes more than 36,000 students arriving via TH 5 and again uses the highway when it takes its materials to schools unable to travel (10,000 additional students). The free membership program is currently in use by 200 Carver County families and the Arboretum plans to extend the program to Scott, Dakota, Ramsey and Hennepin Counties in 2020, offering between 2,000 and 2,500 complementary memberships by 2021.

(Limit 2,800 characters; approximately 400 words)

2. Sub-measure: *Equity Population Benefits and Impacts: A successful project is one that has been designed to provide direct benefits to low-income populations, people of color, persons with disabilities, youth and the elderly. All projects must mitigate potential negative benefits as required under federal law. Projects that are designed to provide benefits go beyond the mitigation requirement to proactively provide transportation benefits and solve transportation issues experienced by Equity populations.*

a. Describe the projects benefits to low-income populations, people of color, children, people with disabilities, and the elderly. Benefits could relate to pedestrian and bicycle safety improvements; public health benefits; direct access improvements for residents or improved access to destinations such as jobs, school, health care or other; travel time improvements; gap closures; new transportation services or modal options, leveraging of other beneficial projects and investments; and/or community connection and cohesion improvements. Note that this is not an exhaustive list.

The MN Landscape Arboretum is a significant cultural resource to the Twin Cities and Minnesota. The campus is accessed from Highway 5 just west of Highway 41. The high traffic volumes leave few gaps and cause a serious safety concern. The project will relocate the Arboretum's access to a new traffic signal at Minnewashta Pkwy, resulting in safe and reliable access.

Two Arboretum programs for social equity populations will benefit from the project. Safe and reliable access to the Arboretum via a new entrance at Minnewashta Pkwy is key to realizing the goals for both programs noted below.

The Arboretum offers youth education field trips (~36,000 students/year) and the Plant Mobile program bringing programming to schools unable to travel to the Arboretum (~10,000 students/year). Many students served are from Minneapolis, St. Paul and inner ring suburbs with diverse student bodies. Roughly 1/3 of students receive assistance to visit (bus and tuition scholarships), which improves access for many lower income students. On-site, students arrive via TH 5 and move between different areas of the grounds. Turning movements are difficult, particularly for large, slow-to-accelerate vehicles such as school buses. The Arboretum anticipates expanding the youth education offering by 30% (up to 60,000 students annually).

The Arboretum offers a complementary membership program for economically disadvantaged Carver County residents. This new program already has 200 recipients. The Arboretum plans to launch this program in Scott, Dakota, Ramsey and Hennepin Counties this year, and

Response:

expects to provide 2,500 complementary memberships in 2021.

The project includes new trails along TH 5 and a pedestrian underpass of TH 5, west of CSAH 13. A separate project will construct a new Highway 5 Regional Trail through the Arboretum in 2020. This will link to an existing trail underpass at Minnewashta Pkwy, connecting existing trails on the north side of TH 5 and on Minnewashta Pkwy. New trail segments will be constructed west of CSAH 13 and on the east side of Bavaria Rd. The new underpass will be constructed under TH 5 at Madelyn Creek Park, connecting to a new trail on the north side of TH 5. The trail network will connect to the Lake Minnetonka LRT Trail, Carver Park Reserve, and downtown Victoria. This network of trails and open spaces will have public health benefits and enable active transportation. New trails along TH 5 will be part of an RBTN Tier 1 Alignment.

The Mount Olivet Rolling Acres (MORA) organization operates a campus at Schutz Lake off CSAH 13, serving individuals with developmental disabilities. This project is expected to allow safer access to and from the MORA campus and provide better access between the MORA campus and the Minnesota Landscape Arboretum.

(Limit 2,800 characters; approximately 400 words)

b. Describe any negative impacts to low-income populations, people of color, children, people with disabilities, and the elderly created by the project, along with measures that will be taken to mitigate them. Negative impacts that are not adequately mitigated can result in a reduction in points.

Below is a list of negative impacts. Note that this is not an exhaustive list.

Increased difficulty in street crossing caused by increased roadway width, increased traffic speed, wider turning radii, or other elements that negatively impact pedestrian access.

Increased noise.

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

Project elements that are detrimental to location-based air quality by increasing stop/start activity at intersections, creating vehicle idling areas, directing an increased number of vehicles to a particular point, etc.

Increased speed and/or cut-through traffic.

Removed or diminished safe bicycle access.

Inclusion of some other barrier to access to jobs and other destinations.

Displacement of residents and businesses.

Mitigation of temporary construction/implementation impacts such as dust; noise; reduced access for travelers and to businesses; disruption of utilities; and eliminated street crossings.

Other

The project is not expected to have negative impacts to low-income populations, people of color, children, people with disabilities, or the elderly. The goal of the project is to make a better transportation environment for all users.

The project lengthens at-grade pedestrian crossings, which will be mitigated by expanding and completing the pedestrian network including utilizing an existing underpass of TH 5 at Minnewashta Pkwy, constructing a new pedestrian underpass with this project, and multiple trail links. A new pedestrian underpass will be constructed under TH 5 approximately 1,000 feet west of CSAH 13, linking Madelyn Creek Park (and numerous Victoria neighborhoods south of TH 5) to the regional trail system. If pedestrians or bicyclists choose to use at-grade crossings, an additional signalized intersection at Minnewashta Pkwy. will be implemented as well as updated pedestrian crossing amenities including countdown timers and audible pedestrian signal push buttons. Medians at intersections will help to channelize and slow traffic. This new bicycling and walking connection will benefit a new medium-density housing development under construction east of Kochia St. This will mitigate for the longer pedestrian crossings of TH 5.

Response:

The increased capacity of Highway 5 will benefit local mobility and safety. Many hours of the day it is difficult to find a gap onto or off of Highway 5 from the community. The improvements will positively affect safe accessibility of local areas for all roadway users, including public assets such as the Minnesota Landscape Arboretum.

Noise will be analyzed during preliminary design and mitigation determined at that time. The project

cost estimate includes a contingency for noise walls.

(Limit 2,800 characters; approximately 400 words)

Select one:

3.Sub-measure: Bonus Points Those projects that score at least 80% of the maximum total points available through sub-measures 1 and 2 will be awarded bonus points based on the geographic location of the project. These points will be assigned as follows, based on the highest-scoring geography the project contacts:

a.25 points to projects within an Area of Concentrated Poverty with 50% or more people of color

b.20 points to projects within an Area of Concentrated Poverty

c.15 points to projects within census tracts with the percent of population in poverty or population of color above the regional average percent

d.10 points for all other areas

Project is located in an Area of Concentrated Poverty where 50% or more of residents are people of color (ACP50):

Project located in Area of Concentrated Poverty:

Projects census tracts are above the regional average for population in poverty or population of color:

Project located in a census tract that is below the regional average for population in poverty or populations of color or includes children, people with disabilities, or the elderly:

Yes

(up to 40% of maximum score)

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

Upload Map

1589557120116_TH5_Arb_Socioeconomic Map.pdf

Measure B: Part 1: Housing Performance Score

City	Segment Length (For stand-alone projects, enter population from Regional Economy map) within each City/Township	Segment Length/Total Project Length	Score	Housing Score Multiplied by Segment percent
Chanhasen	0.7	0.37	19.0	7.0
Victoria	1.2	0.63	8.5	5.368

Total Project Length

Total Project Length

1.9

Project length entered on the Project Information - General form.

Housing Performance Score

Total Project Length (Miles) or Population	1.9
Total Housing Score	12.368

Affordable Housing Scoring

Part 2: Affordable Housing Access

Reference Access to Affordable Housing Guidance located under Regional Solicitation Resources for information on how to respond to this measure and create the map.

If text box is not showing, click Edit or "Add" in top right of page.

The half-mile zone near the project is mostly owned by the Minnesota Landscape Arboretum and will not be developed. As such, affordable housing served by the project but outside of the ½ mile area should be considered. See attached documentation.

Victoria has 457 naturally-occurring affordable housing units. The city has entered into a preliminary development agreement for a senior housing development approximately 1 mile west of the project; 11 of 52 units will be affordable at or below 50% of AMI. This site will include independent living for adults with developmental/intellectual disabilities. The Carver County CDA purchased the property at 8XX Arboretum Blvd, which will be rented at 60% of AMI. There are three scattered site public housing units where residents pay 30% of their income—one each on Marigold Cir, Fieldcreek Cir, and Victoria Dr. There are also Housing Choice Vouchers accepted by private landlords throughout the project area.

Response:

Per Met Council data, Chanhassen has 133 publicly-subsidized affordable housing units and 2,366 affordable housing units overall, which are mostly served by TH 5.

This project will improve access and safety along TH 5 for all modes. Vehicles will benefit from improved safety and mobility. Bicyclists and peds will benefit from an expanded trail network, a new grade-separated underpass, and APS signal features at the Minnewashta Pkwy and CSAH 13 traffic signals. New TH 5 trails will be part of an RBTN Tier 1 Alignment.

SouthWest Transit provides on-demand transit

service to the project corridor (SouthWest Prime). SouthWest Prime allows cost-effective, on-demand transit service for residents. Improvements to TH 5 will improve transit service.

SouthWest Transit provides event-based service for the Arboretum, which also hosts more than 30,000 students, mostly arriving by school bus. Both bus types will benefit from improved access and turning along TH 5. These services expand the opportunity for equity pops. (including affordable housing residents) to access the Arboretum, enjoy the grounds and benefit from programming.

(Limit 2,100 characters; approximately 300 words)

Upload map:

1589558015560_TH5_Arb_Aff_Hsg_8X11L_FINAL.pdf

Measure A: Infrastructure Age

Year of Original Roadway Construction or Most Recent Reconstruction	Segment Length	Calculation	Calculation 2
1970.0	1.9	3743.0	1970.0
	2	3743	1970

Average Construction Year

Weighted Year 1970.0

Total Segment Length (Miles)

Total Segment Length 1.9

Measure A: Congestion Reduction/Air Quality

Total Peak Hour Delay Per Vehicle Without The Project (Seconds/Vehicle)	Total Peak Hour Delay Per Vehicle With The Project (Seconds/Vehicle)	Total Peak Hour Delay Per Vehicle Reduced by Project (Seconds/Vehicle)	Volume without the Project (Vehicles per hour)	Volume with the Project (Vehicles Per Hour):	Total Peak Hour Delay Reduced by the Project:	Total Peak Hour Delay Reduced by the Project:	EXPLANATION of methodology used to calculate railroad crossing delay, if applicable.	Synchro or HCM Reports
110.0	40.0	70.0	2260	2260	158200.0	158200.0	N/A - The last signal retiming for TH 5 occurred in May 2019.	158955828 8876_TH5_Arb_Congestion_FINAL.pdf
						158200		

Vehicle Delay Reduced

Total Peak Hour Delay Reduced	158200.0
Total Peak Hour Delay Reduced	158200.0

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

Total (CO, NOX, and VOC) Peak Hour Emissions without the Project (Kilograms):	Total (CO, NOX, and VOC) Peak Hour Emissions with the Project (Kilograms):	Total (CO, NOX, and VOC) Peak Hour Emissions Reduced by the Project (Kilograms):
24.03	22.21	1.82
24	22	2

Total

Total Emissions Reduced:	1.82
Upload Synchro Report	1589558409516_TH5_Arb_Congestion_FINAL.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):

0

Total (CO, NOX, and VOC)
Peak Hour Emissions with
the Project (Kilograms):

0

Total (CO, NOX, and VOC)
Peak Hour Emissions
Reduced by the Project
(Kilograms):

0

Total Parallel Roadway

Emissions Reduced on Parallel Roadways 0

Upload Synchro Report

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

New Roadway Portion:

Cruise speed in miles per hour with the project: 0

Vehicle miles traveled with the project: 0

Total delay in hours with the project: 0

Total stops in vehicles per hour with the project: 0

Fuel consumption in gallons: 0

Total (CO, NOX, and VOC) Peak Hour Emissions Reduced or
Produced on New Roadway (Kilograms): 0

EXPLANATION of methodology and assumptions used:(Limit
1,400 characters; approximately 200 words)

Total (CO, NOX, and VOC) Peak Hour Emissions Reduced by the
Project (Kilograms): 0.0

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

Cruise speed in miles per hour without the project: 0

Vehicle miles traveled without the project: 0

Total delay in hours without the project: 0

Total stops in vehicles per hour without the project: 0

Cruise speed in miles per hour with the project: 0

Vehicle miles traveled with the project: 0

Total delay in hours with the project: 0

Total stops in vehicles per hour with the project: 0

Fuel consumption in gallons (F1) 0

Fuel consumption in gallons (F2) 0

Fuel consumption in gallons (F3) 0

Total (CO, NOX, and VOC) Peak Hour Emissions Reduced by the Project (Kilograms): 0

EXPLANATION of methodology and assumptions used:(Limit 1,400 characters; approximately 200 words)

Measure A: Benefit of Crash Reduction

Crash Modification Factor Used:

CMF ID: 7572 Convert 2 lane roadway to a 4 lane divided roadway

CMF ID: 323 Install a traffic signal (minor road speed limit at least 40 mph)

CMF ID: 9821 Install right-in/right-out (RIRO) operations at stop-controlled intersections

CMF ID: 292 Physical channelization of both major and minor roads

CMF ID: 293 Physical channelization of both major and minor roads

(Limit 700 Characters; approximately 100 words)

CMF ID 7572 was selected to determine the crash reduction along TH 5 with the two-lane undivided roadway to a four-lane divided roadway conversion. This CMF has a 76.4% crash reduction and applies to all crash types and severity. There were 48 crashes along the TH 5 corridor that this CMF was applied to.

CMF ID 323 was selected to determine the crash reduction at this intersection of TH 5 and Minnewashta Pkwy with a traffic signal. This CMF has a 67% crash reduction and applies to angle crashes of all severity. There were two right angle crashes that this CMF was applied to.

Rationale for Crash Modification Selected:

CMF ID 9821 was selected as the project will convert the existing Arboretum access at Crimson Bay Rd to a right out only. There is not a CMF that only applies to a right out, so this CMF was chosen. CMF 9821 was applied to one crash that occurred involving a vehicle turning left from Arboretum Dr onto TH 5 and a vehicle along eastbound TH 5.

Finally, the project will add medians channelizing the turn lanes and making the CSAH 13 approaches divided, so CMF IDs 292 and 293 were selected. CMF 292 applies to fatal and injury crashes of all crash types and CMF 293 applies to property damage crashes of all crash types. CMF 292 has a 27% crash reduction and CMF 293 has a 13% crash reduction. There were 14 crashes along the CSAH 13 approaches at the TH 5 intersection that CMFs 292 and 293 were applied to.

(Limit 1400 Characters; approximately 200 words)

Project Benefit (\$) from B/C Ratio:	\$15,560,295.00
Total Fatal (K) Crashes:	0
Total Serious Injury (A) Crashes:	0

Total Non-Motorized Fatal and Serious Injury Crashes:	0
Total Crashes:	65
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:	41
Worksheet Attachment	1589558603522_TH5_Arb_Safety-BC-CMF-Crashdata.pdf

Please upload attachment in PDF form.

Roadway projects that include railroad grade-separation elements:

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

Measure A: Multimodal Elements and Existing Connections

This project will enhance walking facilities and improve pedestrian safety at major intersections primarily and by constructing a pedestrian underpass west of the TH 5/CSAH 13 intersection. For pedestrian safety, the project incorporates two separated grade crossings of TH 5: an existing underpass at the TH 5/Minnewashta Pkwy. intersection and a new pedestrian underpass west of CSAH 13 at Madelyn Creek Park. The underpasses eliminate conflict points for crossing the TH 5 corridor. Pedestrian infrastructure will also include accessible pedestrian signal upgrades for at-grade crossings at CSAH 13 and Minnewashta Pkwy (new signal). These improvements will allow safe crossings of the Highway 5 corridor and side streets.

Response:

The proposed improvement will enable the expanding local trail network to achieve its full potential by effectively linking disconnected neighborhoods to the regional system and grade separated crossings. Additional trails along and across the TH 5 corridor will provide access to regional assets such as the Arboretum and Lake Minnetonka LRT Regional Trail, where residents currently have no alternative other than to use the highway shoulder or cross TH 5 at uncontrolled locations. The project will include connection and expansion of trails throughout the project area. These will link with existing facilities, with a new trail through the Minnesota Landscape Arboretum property scheduled for 2020 construction and will provide a connection to the Lake Minnetonka LRT Regional Trail. The new TH 5 trail segments are part of an RBTN Tier 1 Alignment, as is the Lake Minnetonka Trail. The latter allows high quality walking access from the project area to downtown Victoria, downtown Excelsior and to Carver Park Reserve. The expansion of trails helps create a local and regional network of bicycling and pedestrian facilities that allows walking and

bicycling for recreation and transportation.

(Limit 2,800 characters; approximately 400 words)

Measure A: Multimodal Elements and Existing Connections

Bicycle and pedestrian connections are a priority of this project, as it connects and serves a major regional natural asset and destination in the MN Landscape Arboretum. As such, the project incorporates full bicycle and pedestrian accommodations and connections throughout the corridor.

Key bicycle and pedestrian components of the project are multiuse trails along the TH 5 corridor, the addition of a pedestrian underpass of TH 5 west of CSAH 13, utilization of and connection to an existing pedestrian underpass east of Minnewashta Pkwy., enhanced pedestrian crossing facilities at at-grade signalized intersections (new signal at Minnewashta Pkwy.) including ADA upgrades and APS features.

The TH 5 corridor is a Tier 1 RBTN Alignment, and thus a regionally significant connector segment. Significant bicycle and pedestrian connections for the project corridor include: direct connection to the TH 5 Regional Trail through the Arboretum (2020 construction), direct connection to the Lake Minnetonka LRT Regional Trail - a Tier 1 RBTN corridor connecting downtown Victoria and downtown Excelsior, and a direct connection to Madelyn Creek Park.

The grade-separated access under TH 5 (speed limit 55 mph, 28,000 vehicles/day) will link growing south Victoria neighborhoods to the TH 5 Regional Trail, Lake Minnetonka LRT Regional Trail, Carver Park Reserve and downtown Victoria. It also gives neighborhoods north of TH 5 access to Madelyn Creek Park. These features will provide a local network of trails and crossings, enabling access to local and regional destinations, providing better continuity, connecting existing dead-end trail segments, improving crossings of TH 5, and creating more connectivity to the regional trail

Response:

network.

TH 5 is not designated as a Regional Bicycle Barrier in this location; however, TH 5 just east of this location is a 4-lane divided expressway identified as a Tier 2 Regional Bicycle Barrier. Expanding TH 5 to a 4-lane expressway, as proposed in this project, will create the same environment as the existing segment to the east that qualifies as a barrier under the quantitative analysis. This project proactively addresses the extension of the barrier designation by constructing a new pedestrian underpass.

SouthWest Transit provides on-demand transit service SouthWest Prime to the project corridor. SouthWest Prime provides cost-effective, on-demand transit service to residents. Improvements to the bicycle and pedestrian system will provide better access to SouthWest Prime transit service. SouthWest Transit also provides event-based services for the Arboretum. Event parking at the Arboretum can be problematic, so improving transit, pedestrian and bicycle connections to the site will be a major regional benefit.

(Limit 2,800 characters; approximately 400 words)

Transit Projects Not Requiring Construction

If the applicant is completing a transit application that is operations only, check the box and do not complete the remainder of the form. These projects will receive full points for the Risk Assessment.

Park-and-Ride and other transit construction projects require completion of the Risk Assessment below.

[Check Here if Your Transit Project Does Not Require Construction](#)

Measure A: Risk Assessment - Construction Projects

1)Layout (25 Percent of Points)

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

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

Yes

100%

Attach Layout

1589564764348_TH5_Arb_Layout_letter.pdf

Please upload attachment in PDF form.

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

50%

Attach Layout

Please upload attachment in PDF form.

Layout has not been started

0%

Anticipated date or date of completion

05/01/2020

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

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

Yes

100%

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

100%

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

80%

Historic/archeological property impacted; determination of adverse effect anticipated

40%

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

0%

Project is located on an identified historic bridge

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

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

Yes

100%

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

50%

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

25%

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

0%

Anticipated date or date of acquisition

4)Railroad Involvement (15 Percent of Points)

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

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%

Anticipated date or date of executed Agreement

5) Public Involvement (20 percent of points)

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

Meeting with general public: 12/17/2019

Meeting with partner agencies: 04/30/2020

Targeted online/mail outreach: 03/19/2020

Number of respondents: 300

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

100%

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

75%

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

50%

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

50%

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

25%

No outreach has led to the selection of this project.

0%

A full corridor study (Arboretum Area Transportation Plan) is nearing completion for this area, with a multifaceted engagement plan to identify and build support for this project. The TH 5 segment adjacent to the Arboretum was the first phase of the study fully envisioned and completed; subsequent areas for adjacent roads are now in progress. Public engagement efforts include neighborhood meetings, a Stakeholder Advisory Committee made up of residents, business outreach, online surveys and interactive mapping tools, and general public open houses. Overall, approximately 400 people participated in interactive in-person meetings (dates: 6/19/19, 6/25/19, 6/27/19, 7/16/19, 11/6/19, 11/20/19, 12/4/19, 12/17/19, 3/11/20). The project team also held a community pop-up event at the Victoria Classic Car Night (9/4/19), with many comments from seniors and children about the need for the project.

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

Online surveys and a web-based mapping interface served as an additional outreach tools to allow feedback, generating more than 300 online surveys to date with 100+ comments on the interactive map. Partner agencies meet every month as part of a Technical Advisory Committee and continue to engaged elected officials through multiple presentations at City Council meetings. The project has also engaged the public through regular email e-bulletin updates; to date there are 552 e-bulletin subscribers.

Additional project engagement was scheduled for March and April 2020 but was postponed and reworked to an online engagement approach due to the current public health emergency. Project partners are reworking the engagement approach for continued project input over the coming months.

Feedback was solicited at public events and via online surveys and mapping interface. Comments have been summarized and shared with elected officials, stakeholder and technical advisory committees, and with project management staff. Public input was directly used to help identify the project purpose and need, to alter and make changes to potential physical interventions, and to gauge support for possible transportation options on TH 5 and adjacent roadways. For example, many comments focused on safety concerns and lack of ability to gain access to TH 5 from side streets such as Minnewashta Pkwy. Residents detour many miles up to TH 7 due to the safety concern and lack of ability to turn onto TH 5 with the existing configuration. Delay at the TH 5/CSAH 13 intersection was another prominent concern. Engagement activities included a survey of different intersection improvements, and the new and improved signals at these locations were supported by the majority of respondents.

Measure A: Cost Effectiveness

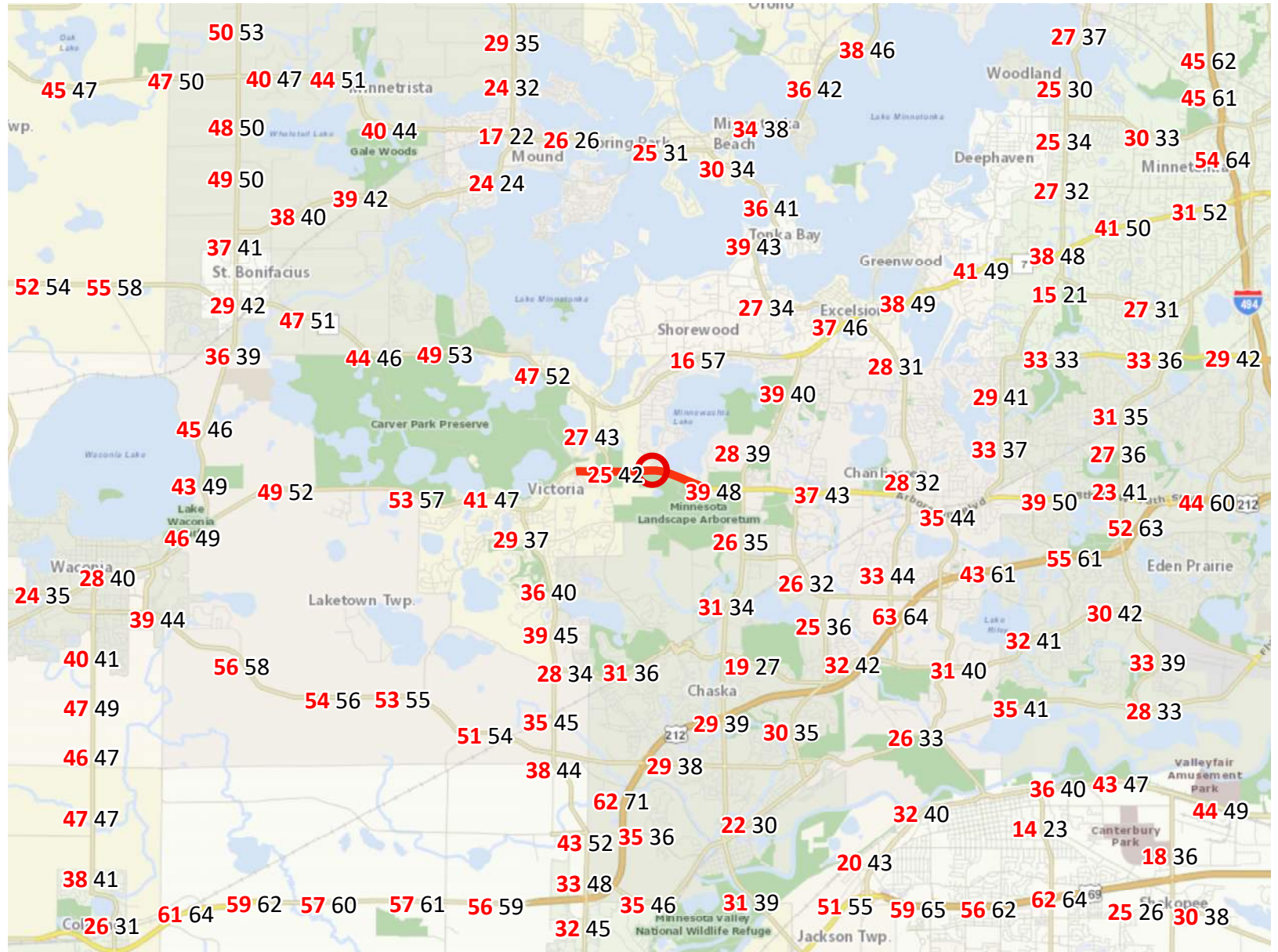
Total Project Cost (entered in Project Cost Form):	\$13,440,000.00
Enter Amount of the Noise Walls:	\$1,200,000.00
Total Project Cost subtract the amount of the noise walls:	\$12,240,000.00
Enter amount of any outside, competitive funding:	\$0.00
Attach documentation of award:	
Points Awarded in Previous Criteria	
Cost Effectiveness	\$0.00

Other Attachments

File Name	Description	File Size
Arboretum LOS 202004231617.pdf	TH 5 Arboretum MN Landscape Arboretum Letter of Support	584 KB
Carver County letter for projects on TH5 TH41 TH212.pdf	TH 5 Arboretum MnDOT Letter of Support	588 KB
TH5_Arb_Layout_FINAL.pdf	TH 5 Arboretum Project Layout	632 KB
TH5_Arb_One-Pager_FINAL.pdf	TH 5 Arboretum One Page Summary	1.0 MB
TH5_Photo.pdf	TH 5 Arboretum Existing Conditions Photo	3.8 MB

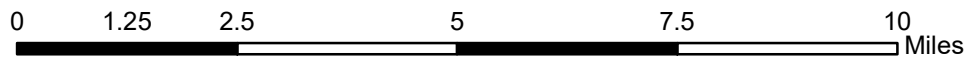
Level of Congestion

Roadway Expansion Project: Highway 5 Arboretum Area Mobility and Access Improvement Pro | Map ID: 1588814015192



 Project Points

 Project



Created: 5/6/2020
LandscapeRSA1

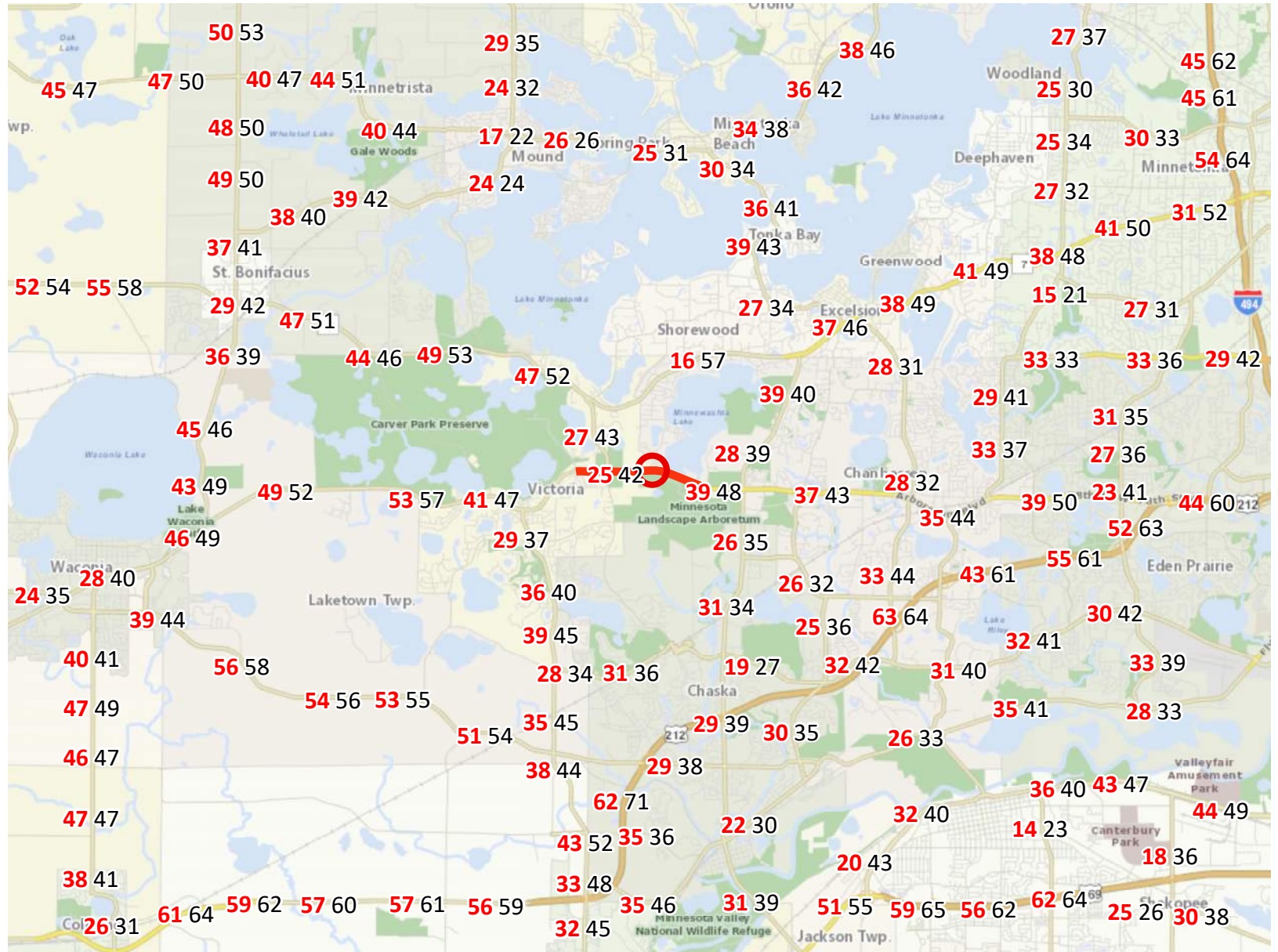


For complete disclaimer of accuracy, please visit
<https://giswebsite.metc.state.mn.us/gis/notice.aspx>



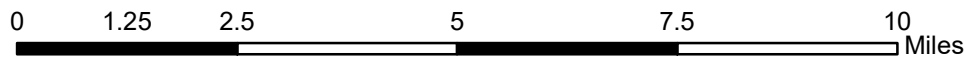
Level of Congestion

Roadway Expansion Project: Highway 5 Arboretum Area Mobility and Access Improvement Pro | Map ID: 1588814015192



○ Project Points

— Project



Created: 5/6/2020
LandscapeRSA1



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



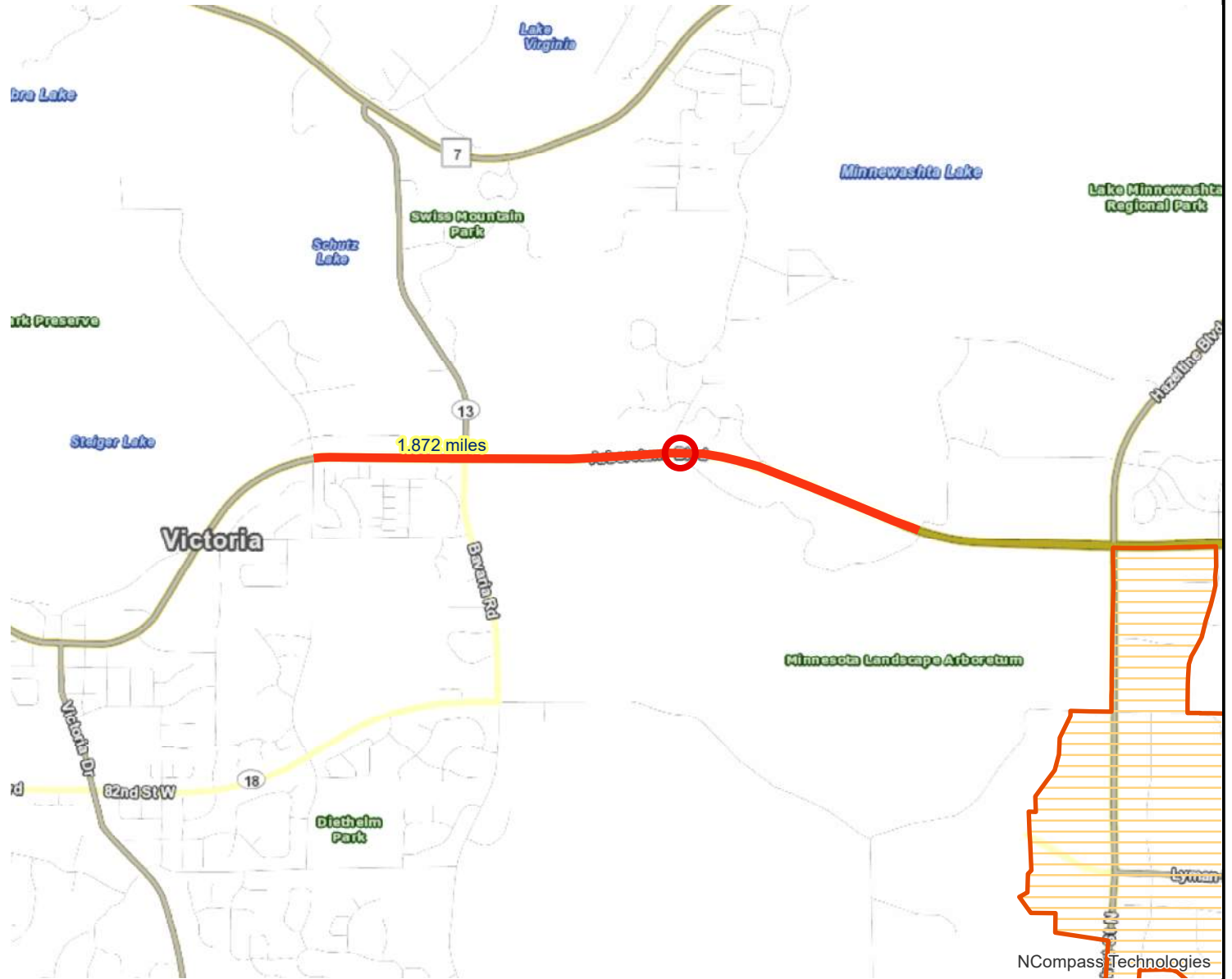
Regional Economy





Results

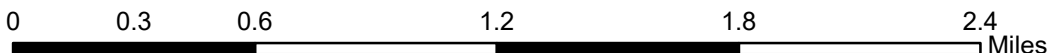
WITHIN ONE MI of project:
Postsecondary Students: 0

Totals by City:

- Chanhassen**
Population: 2403
Employment: 289
Mfg and Dist Employment: 13
- Chaska**
Population: 689
Employment: 779
Mfg and Dist Employment: 738
- Victoria**
Population: 4220
Employment: 1026
Mfg and Dist Employment: 115



-  Project Points
-  Project
-  Manufacturing/Distribution Centers
-  Job Concentration Centers



Created: 5/6/2020
LandscapeRSA5

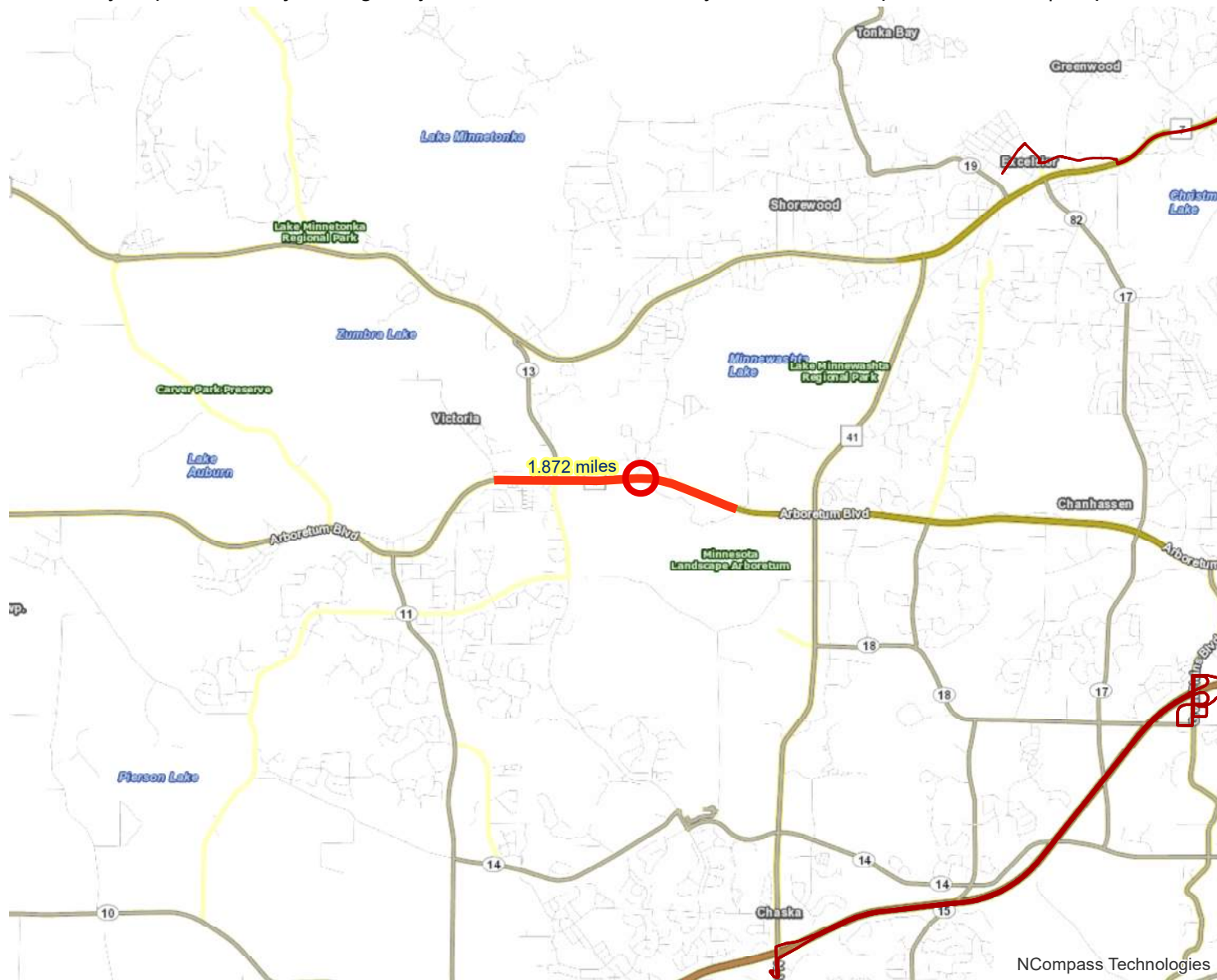


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NCompass Technologies

Transit Connections







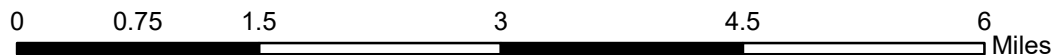
Results

Transit with a Direct Connection to project:
-- NONE --

**indicates Planned Alignments*

Transit Market areas: 5

-  Project Points
-  Transit Routes
-  Project
-  Project Area



Created: 5/6/2020
LandscapeRSA3



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

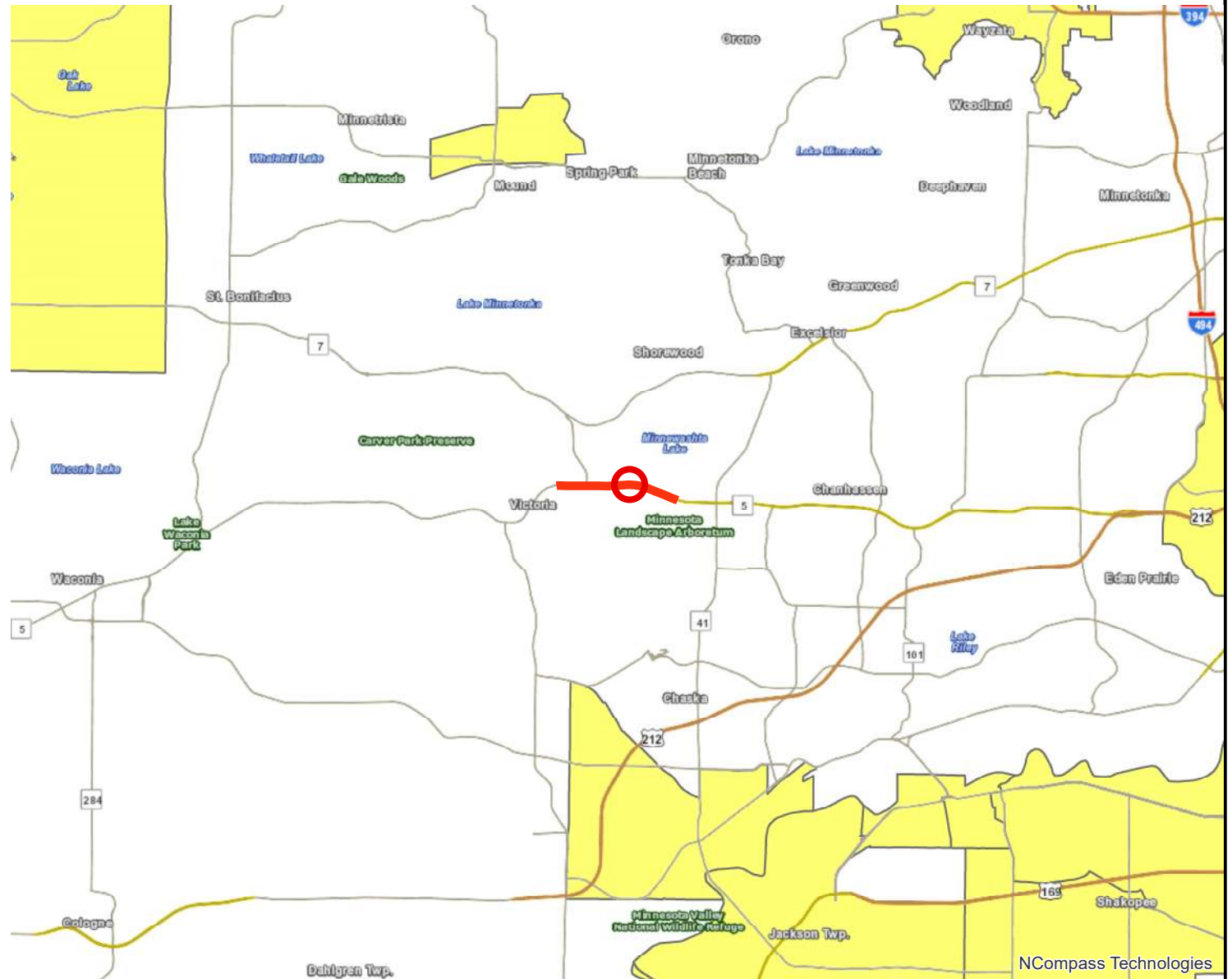





Socio-Economic Conditions



Results

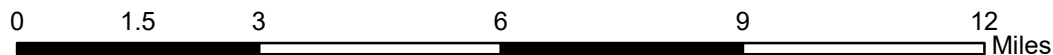
Project located in a census tract that is below the regional average for population in poverty or populations of color, or includes children, people with disabilities, or the elderly:
(0 to 12 Points)

Tracts within half-mile:
90402 90501 90701



-  Points
-  Lines
-  Area of Concentrated Poverty > 50% residents of color

-  Area of Concentrated Poverty
-  Above reg'l avg conc of race/poverty



Created: 5/6/2020
LandscapeRSA2



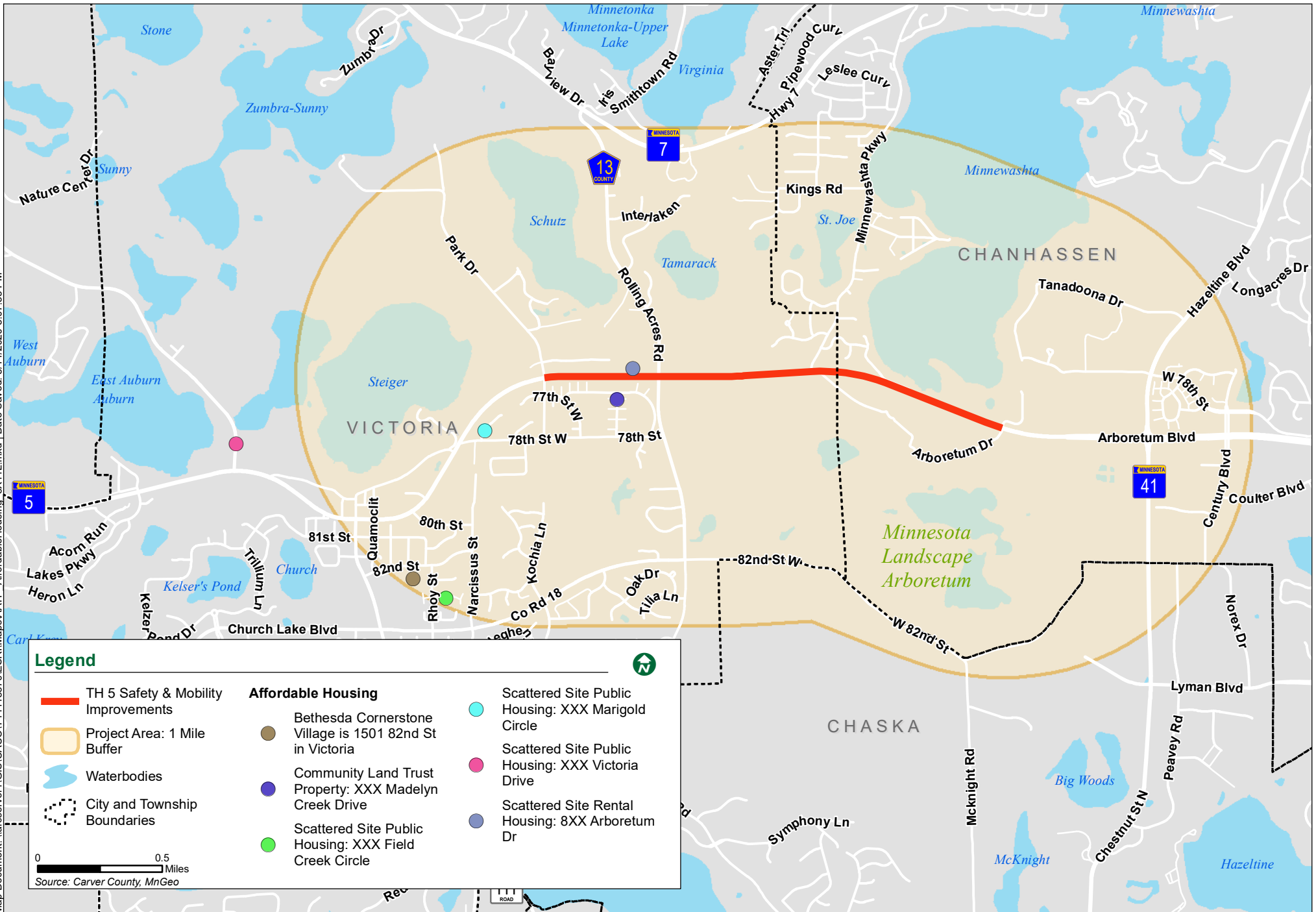
For complete disclaimer of accuracy, please visit
<http://gisweb.site.metc.state.mn.us/gis/site/notice.aspx>





Affordable Housing Highway 5

Name	Location	Stage	Total units	Affordable at 100% AMI	Affordable at 80% AMI	Affordable at 60% AMI	Affordable at 50% AMI	Affordable at 30% AMI	Bedrooms	Funding restrictions	Vouchers accepted?	Fair Housing plan?
Scattered site rentals												
Scattered site public housing	XXX Marigold Circle	Existing	1				Pay 30% of their income		3 bedroom	Public housing	No	CDA's plan
Scattered site public housing	XXX Fieldcreek Circle	Existing	1				Pay 30% of their income		3 bedroom	Public housing	No	CDA's plan
Scattered site public housing	XXX Victoria Drive	Existing	1				Pay 30% of their income		4 bedroom	Public housing	No	CDA's plan
Scattered site rental	8XX Arboretum Blvd	Existing	1		1				3 bedroom	No	Yes	CDA's plan
Owner-Occupied Housing												
Community Land Trust Property	XXX Madelyn Creek	Existing			1					CLT	N/A	CDA's plan

We also know that there are Housing Choice Vouchers being accepted by private landlords throughout this area as well. The total number however is unknown.



Legend

























	TH 5 Safety & Mobility Improvements		Affordable Housing Bethesda Cornerstone Village is 1501 82nd St in Victoria		Scattered Site Public Housing: XXX Marigold Circle
	Project Area: 1 Mile Buffer		Community Land Trust Property: XXX Madelyn Creek Drive		Scattered Site Public Housing: XXX Victoria Drive
	Waterbodies		Scattered Site Public Housing: XXX Field Creek Circle		Scattered Site Rental Housing: 8XX Arboretum Dr
	City and Township Boundaries				

0 0.5 Miles
Source: Carver County, MnGeo

Map Document: \\arcserver1\GIS\CACOT\44118370\ESRI\Maps\AATP_AffordableHousing_8X11L.mxd | Date Saved: 5/14/2020 5:07:33 PM

Lanes, Volumes, Timings
3: Rolling Acres Rd & TH 5

05/07/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	900	30	178	260	81	9	138	373	468	34	12
Future Volume (vph)	48	900	30	178	260	81	9	138	373	468	34	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		225	350		325	250		250	175		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	25			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			0.850			0.850			0.850		0.961	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1790	0
Flt Permitted	0.950			0.950			0.724			0.449		
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1349	1863	1583	836	1790	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			126			126			178		13	
Link Speed (mph)		55			55			45			45	
Link Distance (ft)		3831			3250			2371			2403	
Travel Time (s)		47.5			40.3			35.9			36.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	978	33	193	283	88	10	150	405	509	37	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	52	978	33	193	283	88	10	150	405	509	50	0
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)		12			12			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
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	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	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	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	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8	2		2	6		

Lanes, Volumes, Timings
3: Rolling Acres Rd & TH 5

05/07/2020

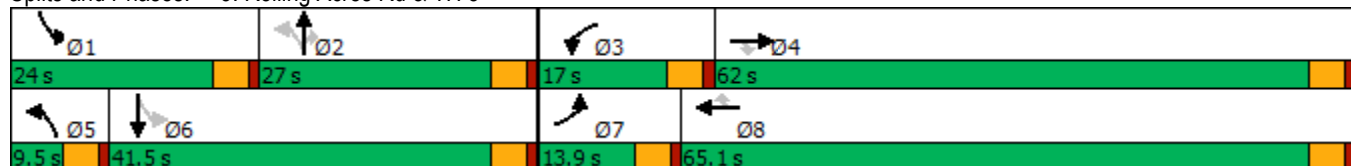


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	13.9	62.0	62.0	17.0	65.1	65.1	9.5	27.0	27.0	24.0	41.5	41.5
Total Split (%)	10.7%	47.7%	47.7%	13.1%	50.1%	50.1%	7.3%	20.8%	20.8%	18.5%	31.9%	31.9%
Maximum Green (s)	9.4	57.5	57.5	12.5	60.6	60.6	5.0	22.5	22.5	19.5	37.0	37.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	8.3	57.5	57.5	12.5	63.8	63.8	27.5	22.5	22.5	46.5	44.6	44.6
Actuated g/C Ratio	0.06	0.44	0.44	0.10	0.49	0.49	0.21	0.17	0.17	0.36	0.34	0.34
v/c Ratio	0.46	1.19	0.04	1.14	0.31	0.10	0.03	0.47	0.96	1.16	0.08	0.08
Control Delay	71.8	129.9	0.1	161.7	22.0	1.3	28.8	53.8	65.3	129.5	24.3	24.3
Queue Delay	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 Delay	71.8	129.9	0.1	161.7	22.0	1.3	28.8	53.8	65.3	129.5	24.3	24.3
LOS	E	F	A	F	C	A	C	D	E	F	C	C
Approach Delay		123.0			66.6			61.6			120.1	
Approach LOS		F			E			E			F	

Intersection Summary

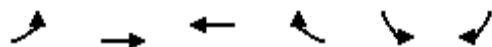
Area Type:	Other
Cycle Length:	130
Actuated Cycle Length:	130
Natural Cycle:	130
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	1.19
Intersection Signal Delay:	98.2
Intersection LOS:	F
Intersection Capacity Utilization:	107.6%
ICU Level of Service:	G
Analysis Period (min):	15

Splits and Phases: 3: Rolling Acres Rd & TH 5



Lanes, Volumes, Timings
6: TH 5 & Minnewashta Pkwy

05/07/2020



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	46	1695	497	14	40	22
Future Volume (vph)	46	1695	497	14	40	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	215			200	225	0
Storage Lanes	1			1	1	1
Taper Length (ft)	25				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)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1863	1863	1583	1770	1583
Link Speed (mph)		55	55		30	
Link Distance (ft)		3250	4236		1335	
Travel Time (s)		40.3	52.5		30.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	1842	540	15	43	24
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	1842	540	15	43	24
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	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		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 99.2% ICU Level of Service F

Analysis Period (min) 15

Lanes, Volumes, Timings
8: TH 5 & Crimson Bay Rd

05/07/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	1685	30	0	510	10	0	0	1	15	0	1
Future Volume (vph)	20	1685	30	0	510	10	0	0	1	15	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	450		300	0		75	0		0
Storage Lanes	1		1	1		1	0		1	0		0
Taper Length (ft)	25			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			0.850			0.850			0.850		0.992	
Flt Protected	0.950										0.955	
Satd. Flow (prot)	1770	1863	1583	1863	1863	1583	0	1863	1583	0	1765	0
Flt Permitted	0.950										0.955	
Satd. Flow (perm)	1770	1863	1583	1863	1863	1583	0	1863	1583	0	1765	0
Link Speed (mph)		55			55			30			30	
Link Distance (ft)		4236			1978			1135			608	
Travel Time (s)		52.5			24.5			25.8			13.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	1832	33	0	554	11	0	0	1	16	0	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	1832	33	0	554	11	0	0	1	0	17	0
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)		12			12			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		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	105.4%
ICU Level of Service	G
Analysis Period (min)	15

Measures of Effectiveness

05/07/2020

Network Totals

Number of Intersections	3
Total Delay (hr)	76
Stops (#)	1960
Average Speed (mph)	28
Total Travel Time (hr)	162
Distance Traveled (mi)	4583
Fuel Consumed (gal)	241
Fuel Economy (mpg)	19.0
Unserviced Vehicles (#)	227
Vehicles in dilemma zone (#)	45
Performance Index	81.8

Detailed Measures of Effectiveness

05/07/2020

3: Rolling Acres Rd & TH 5

Direction	EB	WB	NB	SB	All
Future Volume (vph)	978	519	520	514	2531
Control Delay / Veh (s/v)	123	67	62	120	98
Queue Delay / Veh (s/v)	0	0	0	0	0
Total Delay / Veh (s/v)	123	67	62	120	98
Total Delay (hr)	33	10	9	17	69
Stops / Veh	0.81	0.58	0.62	0.69	0.70
Stops (#)	788	299	322	357	1766
Average Speed (mph)	15	21	17	10	15
Total Travel Time (hr)	46	15	14	22	98
Distance Traveled (mi)	710	319	234	234	1497
Fuel Consumed (gal)	63	23	19	25	130
Fuel Economy (mpg)	11.3	13.7	12.6	9.3	11.5
CO Emissions (kg)	4.40	1.63	1.30	1.75	9.07
NOx Emissions (kg)	0.86	0.32	0.25	0.34	1.76
VOC Emissions (kg)	1.02	0.38	0.30	0.41	2.10
Unserviced Vehicles (#)	142	21	0	64	227
Vehicles in dilemma zone (#)	29	9	5	2	45

6: TH 5 & Minnewashta Pkwy

Direction	EB	WB	SB	All
Future Volume (vph)	1741	511	62	2314
Control Delay / Veh (s/v)	0	0	322	9
Queue Delay / Veh (s/v)	0	0	0	0
Total Delay / Veh (s/v)	0	0	322	9
Total Delay (hr)	0	0	6	6
Stops / Veh	0.05	0.00	1.00	0.06
Stops (#)	80	0	62	142
Average Speed (mph)	55	55	3	45
Total Travel Time (hr)	20	7	6	33
Distance Traveled (mi)	1072	410	16	1497
Fuel Consumed (gal)	37	14	5	56
Fuel Economy (mpg)	28.6	29.9	3.1	26.7
CO Emissions (kg)	2.62	0.96	0.35	3.93
NOx Emissions (kg)	0.51	0.19	0.07	0.76
VOC Emissions (kg)	0.61	0.22	0.08	0.91
Unserviced Vehicles (#)	0	0	0	0
Vehicles in dilemma zone (#)	0	0	0	0

Detailed Measures of Effectiveness

05/07/2020

8: TH 5 & Crimson Bay Rd

























Direction	EB	WB	NB	SB	All
Future Volume (vph)	1735	520	1	16	2272
Control Delay / Veh (s/v)	0	0	163	348	3
Queue Delay / Veh (s/v)	0	0	0	0	0
Total Delay / Veh (s/v)	0	0	163	348	3
Total Delay (hr)	0	0	0	2	2
Stops / Veh	0.02	0.00	1.00	1.00	0.02
Stops (#)	35	0	1	16	52
Average Speed (mph)	55	55	4	1	52
Total Travel Time (hr)	25	4	0	2	31
Distance Traveled (mi)	1392	195	0	2	1589
Fuel Consumed (gal)	47	7	0	1	55
Fuel Economy (mpg)	29.5	29.9	NA	1.4	28.8
CO Emissions (kg)	3.30	0.46	0.00	0.09	3.85
NOx Emissions (kg)	0.64	0.09	0.00	0.02	0.75
VOC Emissions (kg)	0.77	0.11	0.00	0.02	0.89
Unserviced Vehicles (#)	0	0	0	0	0
Vehicles in dilemma zone (#)	0	0	0	0	0

Network Totals

Number of Intersections	3
Control Delay / Veh (s/v)	39
Queue Delay / Veh (s/v)	0
Total Delay / Veh (s/v)	39
Total Delay (hr)	76
Stops / Veh	0.28
Stops (#)	1960
Average Speed (mph)	28
Total Travel Time (hr)	162
Distance Traveled (mi)	4583
Fuel Consumed (gal)	241
Fuel Economy (mpg)	19.0
CO Emissions (kg)	16.85
NOx Emissions (kg)	3.28
VOC Emissions (kg)	3.90
Unserviced Vehicles (#)	227
Vehicles in dilemma zone (#)	45
Performance Index	81.8

Lanes, Volumes, Timings
3: Rolling Acres Rd & TH 5

05/07/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	900	30	178	260	81	9	138	373	468	34	12
Future Volume (vph)	48	900	30	178	260	81	9	138	373	468	34	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		300	400		400	450		450	250		250
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850			0.850			0.850		0.961	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	3433	1790	0
Flt Permitted	0.950			0.950			0.724			0.545		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1349	1863	1583	1969	1790	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			143			143			82			13
Link Speed (mph)		55			55			45			45	
Link Distance (ft)		1263			3250			2371			2403	
Travel Time (s)		15.7			40.3			35.9			36.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	978	33	193	283	88	10	150	405	509	37	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	52	978	33	193	283	88	10	150	405	509	50	0
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)		12			12			24			24	
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
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	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	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	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	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	custom	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8	2		2 3	6		

Lanes, Volumes, Timings
3: Rolling Acres Rd & TH 5

05/07/2020

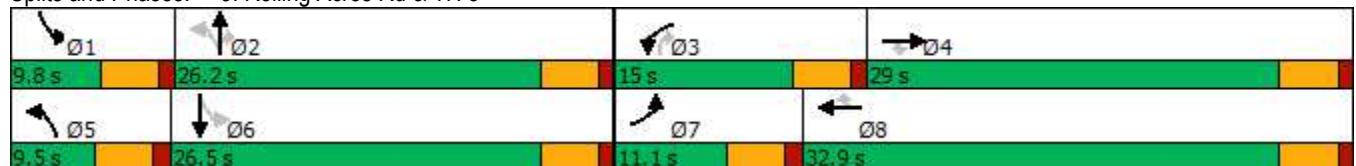


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8	8	5	2	2 3	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5		9.5	22.5	
Total Split (s)	11.1	29.0	29.0	15.0	32.9	32.9	9.5	26.2		9.8	26.5	
Total Split (%)	13.9%	36.3%	36.3%	18.8%	41.1%	41.1%	11.9%	32.8%		12.3%	33.1%	
Maximum Green (s)	6.6	24.5	24.5	10.5	28.4	28.4	5.0	21.7		5.3	22.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Max		None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0	0		0	0		0			0	
Act Effct Green (s)	6.4	24.1	24.1	10.4	32.4	32.4	26.7	21.7	36.6	30.7	29.6	
Actuated g/C Ratio	0.08	0.30	0.30	0.13	0.41	0.41	0.34	0.27	0.46	0.39	0.37	
v/c Ratio	0.37	0.91	0.06	0.84	0.20	0.12	0.02	0.30	0.52	0.59	0.07	
Control Delay	42.5	40.9	0.2	65.0	16.9	1.3	15.1	25.0	14.9	21.7	15.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	42.5	40.9	0.2	65.0	16.9	1.3	15.1	25.0	14.9	21.7	15.0	
LOS	D	D	A	E	B	A	B	C	B	C	B	
Approach Delay		39.7			30.9			17.6			21.1	
Approach LOS		D			C			B			C	

Intersection Summary

Area Type:	Other
Cycle Length:	80
Actuated Cycle Length:	79.5
Natural Cycle:	75
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.91
Intersection Signal Delay:	29.6
Intersection LOS:	C
Intersection Capacity Utilization:	72.6%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 3: Rolling Acres Rd & TH 5



Lanes, Volumes, Timings
6: TH 5 & Minnewashta Pkwy

05/07/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	1665	30	0	497	14	0	0	0	40	0	22
Future Volume (vph)	46	1665	30	0	497	14	0	0	0	40	0	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		300	600		300	200		200	225		225
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850				0.850					0.850
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1770	3539	1583	1863	3539	1583	1863	1863	1863	1770	1863	1583
Flt Permitted	0.395									0.757		
Satd. Flow (perm)	736	3539	1583	1863	3539	1583	1863	1863	1863	1410	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			82			82						381
Link Speed (mph)		55			55			30				30
Link Distance (ft)		3250			1551			1280				1335
Travel Time (s)		40.3			19.2			29.1				30.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	1810	33	0	540	15	0	0	0	43	0	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	50	1810	33	0	540	15	0	0	0	43	0	24
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)		12			12			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
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	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	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	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	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm		Perm	Perm		Perm
Protected Phases	7	4		3	8			2				6
Permitted Phases	4		4	8		8	2		2	6		6

Lanes, Volumes, Timings
6: TH 5 & Minnewashta Pkwy

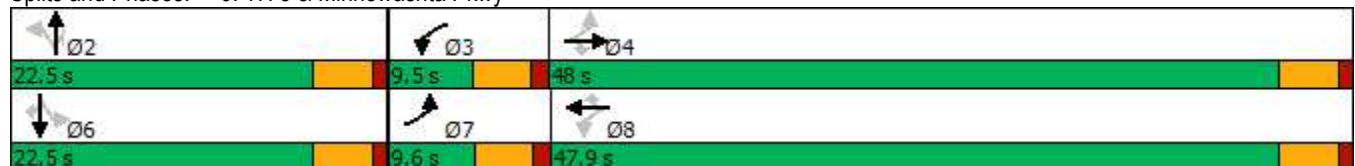
05/07/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.6	48.0	48.0	9.5	47.9	47.9	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (%)	12.0%	60.0%	60.0%	11.9%	59.9%	59.9%	28.1%	28.1%	28.1%	28.1%	28.1%	28.1%
Maximum Green (s)	5.1	43.5	43.5	5.0	43.4	43.4	18.0	18.0	18.0	18.0	18.0	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Min	Min	Min	Min	Min	Min
Walk Time (s)		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0	0	0	0	0	0	0
Act Effct Green (s)	37.4	37.4	37.4		32.2	32.2				7.3		7.3
Actuated g/C Ratio	0.69	0.69	0.69		0.60	0.60				0.14		0.14
v/c Ratio	0.08	0.74	0.03		0.26	0.02				0.23		0.04
Control Delay	3.0	7.4	0.2		6.5	0.0				26.1		0.1
Queue Delay	0.0	0.0	0.0		0.0	0.0				0.0		0.0
Total Delay	3.0	7.4	0.2		6.5	0.0				26.1		0.1
LOS	A	A	A		A	A				C		A
Approach Delay		7.2			6.3							16.8
Approach LOS		A			A							B

Intersection Summary



















Area Type:	Other
Cycle Length:	80
Actuated Cycle Length:	53.9
Natural Cycle:	80
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.74
Intersection Signal Delay:	7.3
Intersection LOS:	A
Intersection Capacity Utilization:	57.7%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 6: TH 5 & Minnewashta Pkwy



Lanes, Volumes, Timings
11: TH 5 & Crimson Bay Rd

05/07/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	1685	0	0	510	10	0	0	1	15	0	1
Future Volume (vph)	20	1685	0	0	510	10	0	0	1	15	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		300	0		0	0		0
Storage Lanes	1		0	0		1	0		1	0		0
Taper Length (ft)	25			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						0.850			0.865		0.992	
Flt Protected	0.950										0.955	
Satd. Flow (prot)	1770	1863	0	0	1863	1583	0	0	1611	0	1765	0
Flt Permitted	0.950										0.955	
Satd. Flow (perm)	1770	1863	0	0	1863	1583	0	0	1611	0	1765	0
Link Speed (mph)		55			55			30			30	
Link Distance (ft)		2678			1979			1141			605	
Travel Time (s)		33.2			24.5			25.9			13.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	1832	0	0	554	11	0	0	1	16	0	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	1832	0	0	554	11	0	0	1	0	17	0
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)		12			12			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		Free			Free			Yield			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	105.4%
ICU Level of Service	G
Analysis Period (min)	15

Measures of Effectiveness

05/07/2020

Network Totals

Number of Intersections	3
Total Delay (hr)	27
Stops (#)	3046
Average Speed (mph)	41
Total Travel Time (hr)	111
Distance Traveled (mi)	4505
Fuel Consumed (gal)	223
Fuel Economy (mpg)	20.2
Unserviced Vehicles (#)	0
Vehicles in dilemma zone (#)	257
Performance Index	35.6

Detailed Measures of Effectiveness

05/07/2020

3: Rolling Acres Rd & TH 5

Direction	EB	WB	NB	SB	All
Future Volume (vph)	978	519	520	514	2531
Control Delay / Veh (s/v)	40	31	18	21	30
Queue Delay / Veh (s/v)	0	0	0	0	0
Total Delay / Veh (s/v)	40	31	18	21	30
Total Delay (hr)	11	4	3	3	21
Stops / Veh	0.86	0.62	0.62	0.72	0.73
Stops (#)	840	320	323	369	1852
Average Speed (mph)	29	31	30	28	30
Total Travel Time (hr)	23	10	8	8	49
Distance Traveled (mi)	659	319	234	234	1446
Fuel Consumed (gal)	46	20	14	15	94
Fuel Economy (mpg)	14.5	16.1	16.8	15.8	15.4
CO Emissions (kg)	3.19	1.39	0.97	1.04	6.58
NOx Emissions (kg)	0.62	0.27	0.19	0.20	1.28
VOC Emissions (kg)	0.74	0.32	0.22	0.24	1.53
Unserviced Vehicles (#)	0	0	0	0	0
Vehicles in dilemma zone (#)	53	14	9	2	78

6: TH 5 & Minnewashta Pkwy

Direction	EB	WB	SB	All
Future Volume (vph)	1741	511	62	2314
Control Delay / Veh (s/v)	7	6	17	7
Queue Delay / Veh (s/v)	0	0	0	0
Total Delay / Veh (s/v)	7	6	17	7
Total Delay (hr)	3	1	0	5
Stops / Veh	0.51	0.42	0.58	0.49
Stops (#)	893	214	36	1143
Average Speed (mph)	47	49	19	47
Total Travel Time (hr)	23	8	1	32
Distance Traveled (mi)	1072	409	16	1497
Fuel Consumed (gal)	55	18	1	74
Fuel Economy (mpg)	19.5	22.3	14.8	20.1
CO Emissions (kg)	3.84	1.28	0.07	5.20
NOx Emissions (kg)	0.75	0.25	0.01	1.01
VOC Emissions (kg)	0.89	0.30	0.02	1.20
Unserviced Vehicles (#)	0	0	0	0
Vehicles in dilemma zone (#)	141	38	0	179

Detailed Measures of Effectiveness

05/07/2020

11: TH 5 & Crimson Bay Rd

























Direction	EB	WB	NB	SB	All
Future Volume (vph)	1705	520	1	16	2242
Control Delay / Veh (s/v)	0	0	43	348	3
Queue Delay / Veh (s/v)	0	0	0	0	0
Total Delay / Veh (s/v)	0	0	43	348	3
Total Delay (hr)	0	0	0	2	2
Stops / Veh	0.02	0.00	0.00	1.00	0.02
Stops (#)	35	0	0	16	51
Average Speed (mph)	55	55	11	1	52
Total Travel Time (hr)	25	4	0	2	30
Distance Traveled (mi)	1366	195	0	2	1563
Fuel Consumed (gal)	46	7	0	1	54
Fuel Economy (mpg)	29.5	29.9	NA	1.4	28.8
CO Emissions (kg)	3.24	0.46	0.00	0.09	3.79
NOx Emissions (kg)	0.63	0.09	0.00	0.02	0.74
VOC Emissions (kg)	0.75	0.11	0.00	0.02	0.88
Unserviced Vehicles (#)	0	0	0	0	0
Vehicles in dilemma zone (#)	0	0	0	0	0

Network Totals

Number of Intersections	3
Control Delay / Veh (s/v)	14
Queue Delay / Veh (s/v)	0
Total Delay / Veh (s/v)	14
Total Delay (hr)	27
Stops / Veh	0.43
Stops (#)	3046
Average Speed (mph)	41
Total Travel Time (hr)	111
Distance Traveled (mi)	4505
Fuel Consumed (gal)	223
Fuel Economy (mpg)	20.2
CO Emissions (kg)	15.57
NOx Emissions (kg)	3.03
VOC Emissions (kg)	3.61
Unserviced Vehicles (#)	0
Vehicles in dilemma zone (#)	257
Performance Index	35.6

Lanes, Volumes, Timings
3: Rolling Acres Rd & TH 5

05/07/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	900	30	178	260	81	9	138	373	468	34	12
Future Volume (vph)	48	900	30	178	260	81	9	138	373	468	34	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		225	350		325	250		250	175		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	25			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			0.850			0.850			0.850		0.961	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1863	1583	1770	1790	0
Flt Permitted	0.950			0.950			0.724			0.449		
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	1349	1863	1583	836	1790	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			126			126			178			13
Link Speed (mph)		55			55			45			45	
Link Distance (ft)		3831			3250			2371			2403	
Travel Time (s)		47.5			40.3			35.9			36.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	978	33	193	283	88	10	150	405	509	37	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	52	978	33	193	283	88	10	150	405	509	50	0
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)		12			12			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
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	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	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	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	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8	2		2	6		

Lanes, Volumes, Timings
3: Rolling Acres Rd & TH 5

05/07/2020

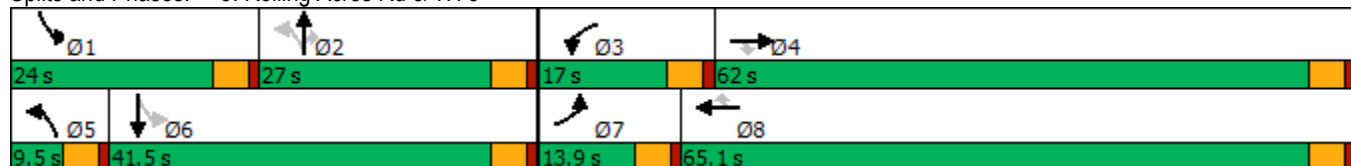


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5
Total Split (s)	13.9	62.0	62.0	17.0	65.1	65.1	9.5	27.0	27.0	24.0	41.5	41.5
Total Split (%)	10.7%	47.7%	47.7%	13.1%	50.1%	50.1%	7.3%	20.8%	20.8%	18.5%	31.9%	31.9%
Maximum Green (s)	9.4	57.5	57.5	12.5	60.6	60.6	5.0	22.5	22.5	19.5	37.0	37.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	None	Max	Max
Walk Time (s)		7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0		0	0
Act Effct Green (s)	8.3	57.5	57.5	12.5	63.8	63.8	27.5	22.5	22.5	46.5	44.6	44.6
Actuated g/C Ratio	0.06	0.44	0.44	0.10	0.49	0.49	0.21	0.17	0.17	0.36	0.34	0.34
v/c Ratio	0.46	1.19	0.04	1.14	0.31	0.10	0.03	0.47	0.96	1.16	0.08	0.08
Control Delay	71.8	129.9	0.1	161.7	22.0	1.3	28.8	53.8	65.3	129.5	24.3	24.3
Queue Delay	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 Delay	71.8	129.9	0.1	161.7	22.0	1.3	28.8	53.8	65.3	129.5	24.3	24.3
LOS	E	F	A	F	C	A	C	D	E	F	C	C
Approach Delay		123.0			66.6			61.6			120.1	
Approach LOS		F			E			E			F	

Intersection Summary

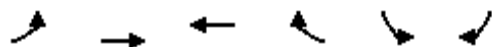
Area Type:	Other
Cycle Length:	130
Actuated Cycle Length:	130
Natural Cycle:	130
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	1.19
Intersection Signal Delay:	98.2
Intersection LOS:	F
Intersection Capacity Utilization:	107.6%
ICU Level of Service:	G
Analysis Period (min):	15

Splits and Phases: 3: Rolling Acres Rd & TH 5



Lanes, Volumes, Timings
6: TH 5 & Minnewashta Pkwy

05/07/2020



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	46	1695	497	14	40	22
Future Volume (vph)	46	1695	497	14	40	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	215			200	225	0
Storage Lanes	1			1	1	1
Taper Length (ft)	25				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)	1770	1863	1863	1583	1770	1583
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	1863	1863	1583	1770	1583
Link Speed (mph)		55	55		30	
Link Distance (ft)		3250	4236		1335	
Travel Time (s)		40.3	52.5		30.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	1842	540	15	43	24
Shared Lane Traffic (%)						
Lane Group Flow (vph)	50	1842	540	15	43	24
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	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		Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 99.2% ICU Level of Service F

Analysis Period (min) 15

Lanes, Volumes, Timings
8: TH 5 & Crimson Bay Rd

05/07/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	1685	30	0	510	10	0	0	1	15	0	1
Future Volume (vph)	20	1685	30	0	510	10	0	0	1	15	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		150	450		300	0		75	0		0
Storage Lanes	1		1	1		1	0		1	0		0
Taper Length (ft)	25			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			0.850			0.850			0.850		0.992	
Flt Protected	0.950										0.955	
Satd. Flow (prot)	1770	1863	1583	1863	1863	1583	0	1863	1583	0	1765	0
Flt Permitted	0.950										0.955	
Satd. Flow (perm)	1770	1863	1583	1863	1863	1583	0	1863	1583	0	1765	0
Link Speed (mph)		55			55			30			30	
Link Distance (ft)		4236			1978			1135			608	
Travel Time (s)		52.5			24.5			25.8			13.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	1832	33	0	554	11	0	0	1	16	0	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	1832	33	0	554	11	0	0	1	0	17	0
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)		12			12			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		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	105.4%
ICU Level of Service	G
Analysis Period (min)	15

Measures of Effectiveness

05/07/2020

Network Totals

Number of Intersections	3
Total Delay (hr)	76
Stops (#)	1960
Average Speed (mph)	28
Total Travel Time (hr)	162
Distance Traveled (mi)	4583
Fuel Consumed (gal)	241
Fuel Economy (mpg)	19.0
Unserviced Vehicles (#)	227
Vehicles in dilemma zone (#)	45
Performance Index	81.8

Detailed Measures of Effectiveness

05/07/2020

3: Rolling Acres Rd & TH 5

Direction	EB	WB	NB	SB	All
Future Volume (vph)	978	519	520	514	2531
Control Delay / Veh (s/v)	123	67	62	120	98
Queue Delay / Veh (s/v)	0	0	0	0	0
Total Delay / Veh (s/v)	123	67	62	120	98
Total Delay (hr)	33	10	9	17	69
Stops / Veh	0.81	0.58	0.62	0.69	0.70
Stops (#)	788	299	322	357	1766
Average Speed (mph)	15	21	17	10	15
Total Travel Time (hr)	46	15	14	22	98
Distance Traveled (mi)	710	319	234	234	1497
Fuel Consumed (gal)	63	23	19	25	130
Fuel Economy (mpg)	11.3	13.7	12.6	9.3	11.5
CO Emissions (kg)	4.40	1.63	1.30	1.75	9.07
NOx Emissions (kg)	0.86	0.32	0.25	0.34	1.76
VOC Emissions (kg)	1.02	0.38	0.30	0.41	2.10
Unserviced Vehicles (#)	142	21	0	64	227
Vehicles in dilemma zone (#)	29	9	5	2	45

6: TH 5 & Minnewashta Pkwy

Direction	EB	WB	SB	All
Future Volume (vph)	1741	511	62	2314
Control Delay / Veh (s/v)	0	0	322	9
Queue Delay / Veh (s/v)	0	0	0	0
Total Delay / Veh (s/v)	0	0	322	9
Total Delay (hr)	0	0	6	6
Stops / Veh	0.05	0.00	1.00	0.06
Stops (#)	80	0	62	142
Average Speed (mph)	55	55	3	45
Total Travel Time (hr)	20	7	6	33
Distance Traveled (mi)	1072	410	16	1497
Fuel Consumed (gal)	37	14	5	56
Fuel Economy (mpg)	28.6	29.9	3.1	26.7
CO Emissions (kg)	2.62	0.96	0.35	3.93
NOx Emissions (kg)	0.51	0.19	0.07	0.76
VOC Emissions (kg)	0.61	0.22	0.08	0.91
Unserviced Vehicles (#)	0	0	0	0
Vehicles in dilemma zone (#)	0	0	0	0

Detailed Measures of Effectiveness

05/07/2020

8: TH 5 & Crimson Bay Rd

Direction	EB	WB	NB	SB	All
Future Volume (vph)	1735	520	1	16	2272
Control Delay / Veh (s/v)	0	0	163	348	3
Queue Delay / Veh (s/v)	0	0	0	0	0
Total Delay / Veh (s/v)	0	0	163	348	3
Total Delay (hr)	0	0	0	2	2
Stops / Veh	0.02	0.00	1.00	1.00	0.02
Stops (#)	35	0	1	16	52
Average Speed (mph)	55	55	4	1	52
Total Travel Time (hr)	25	4	0	2	31
Distance Traveled (mi)	1392	195	0	2	1589
Fuel Consumed (gal)	47	7	0	1	55
Fuel Economy (mpg)	29.5	29.9	NA	1.4	28.8
CO Emissions (kg)	3.30	0.46	0.00	0.09	3.85
NOx Emissions (kg)	0.64	0.09	0.00	0.02	0.75
VOC Emissions (kg)	0.77	0.11	0.00	0.02	0.89
Unserviced Vehicles (#)	0	0	0	0	0
Vehicles in dilemma zone (#)	0	0	0	0	0

Network Totals

Number of Intersections	3
Control Delay / Veh (s/v)	39
Queue Delay / Veh (s/v)	0
Total Delay / Veh (s/v)	39
Total Delay (hr)	76
Stops / Veh	0.28
Stops (#)	1960
Average Speed (mph)	28
Total Travel Time (hr)	162
Distance Traveled (mi)	4583
Fuel Consumed (gal)	241
Fuel Economy (mpg)	19.0
CO Emissions (kg)	16.85
NOx Emissions (kg)	3.28
VOC Emissions (kg)	3.90
Unserviced Vehicles (#)	227
Vehicles in dilemma zone (#)	45
Performance Index	81.8

Lanes, Volumes, Timings
3: Rolling Acres Rd & TH 5

05/07/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗↗	↘	↘	↗↗	↘	↘	↗	↘	↗↗	↘	↗
Traffic Volume (vph)	48	900	30	178	260	81	9	138	373	468	34	12
Future Volume (vph)	48	900	30	178	260	81	9	138	373	468	34	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		300	400		400	450		450	250		250
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt			0.850			0.850			0.850		0.961	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	3433	1790	0
Flt Permitted	0.950			0.950			0.724			0.545		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1349	1863	1583	1969	1790	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			143			143			82			13
Link Speed (mph)		55			55			45				45
Link Distance (ft)		1263			3250			2371				2403
Travel Time (s)		15.7			40.3			35.9				36.4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	978	33	193	283	88	10	150	405	509	37	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	52	978	33	193	283	88	10	150	405	509	50	0
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)		12			12			24				24
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
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	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	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	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	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	pm+pt	NA	custom	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8	2		2 3	6		

Lanes, Volumes, Timings
3: Rolling Acres Rd & TH 5

05/07/2020

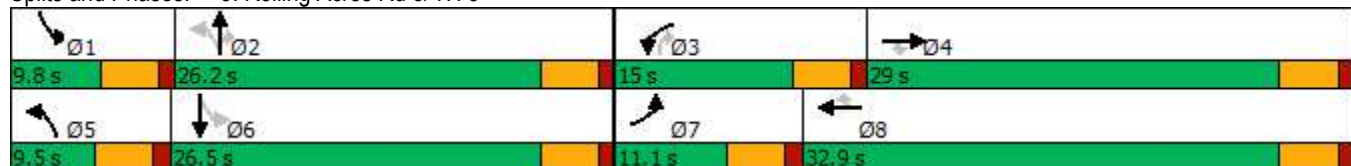


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8	8	5	2	2 3	1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5		9.5	22.5	
Total Split (s)	11.1	29.0	29.0	15.0	32.9	32.9	9.5	26.2		9.8	26.5	
Total Split (%)	13.9%	36.3%	36.3%	18.8%	41.1%	41.1%	11.9%	32.8%		12.3%	33.1%	
Maximum Green (s)	6.6	24.5	24.5	10.5	28.4	28.4	5.0	21.7		5.3	22.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Max		None	Max	
Walk Time (s)		7.0	7.0		7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		11.0	11.0		11.0	11.0		11.0			11.0	
Pedestrian Calls (#/hr)		0	0		0	0		0			0	
Act Effct Green (s)	6.4	24.1	24.1	10.4	32.4	32.4	26.7	21.7	36.6	30.7	29.6	
Actuated g/C Ratio	0.08	0.30	0.30	0.13	0.41	0.41	0.34	0.27	0.46	0.39	0.37	
v/c Ratio	0.37	0.91	0.06	0.84	0.20	0.12	0.02	0.30	0.52	0.59	0.07	
Control Delay	42.5	40.9	0.2	65.0	16.9	1.3	15.1	25.0	14.9	21.7	15.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	42.5	40.9	0.2	65.0	16.9	1.3	15.1	25.0	14.9	21.7	15.0	
LOS	D	D	A	E	B	A	B	C	B	C	B	
Approach Delay		39.7			30.9			17.6			21.1	
Approach LOS		D			C			B			C	

Intersection Summary

























Area Type:	Other
Cycle Length:	80
Actuated Cycle Length:	79.5
Natural Cycle:	75
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.91
Intersection Signal Delay:	29.6
Intersection LOS:	C
Intersection Capacity Utilization:	72.6%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 3: Rolling Acres Rd & TH 5



Lanes, Volumes, Timings
6: TH 5 & Minnewashta Pkwy

05/07/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	1665	30	0	497	14	0	0	0	40	0	22
Future Volume (vph)	46	1665	30	0	497	14	0	0	0	40	0	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300		300	600		300	200		200	225		225
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850						0.850
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1770	3539	1583	1863	3539	1583	1863	1863	1863	1770	1863	1583
Flt Permitted	0.395									0.757		
Satd. Flow (perm)	736	3539	1583	1863	3539	1583	1863	1863	1863	1410	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			82			82						381
Link Speed (mph)		55			55			30				30
Link Distance (ft)		3250			1551			1280				1335
Travel Time (s)		40.3			19.2			29.1				30.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	1810	33	0	540	15	0	0	0	43	0	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	50	1810	33	0	540	15	0	0	0	43	0	24
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)		12			12			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
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	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	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	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	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm		Perm	Perm		Perm
Protected Phases	7	4		3	8			2				6
Permitted Phases	4		4	8		8	2		2	6		6

Lanes, Volumes, Timings
6: TH 5 & Minnewashta Pkwy

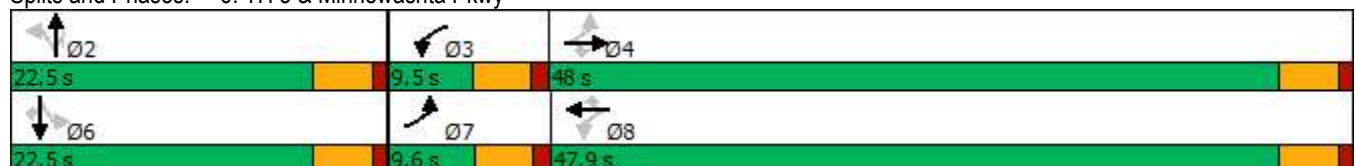
05/07/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4	4	3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	9.6	48.0	48.0	9.5	47.9	47.9	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (%)	12.0%	60.0%	60.0%	11.9%	59.9%	59.9%	28.1%	28.1%	28.1%	28.1%	28.1%	28.1%
Maximum Green (s)	5.1	43.5	43.5	5.0	43.4	43.4	18.0	18.0	18.0	18.0	18.0	18.0
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	Min	Min	Min	Min	Min	Min
Walk Time (s)		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0	0	0	0	0	0	0
Act Effct Green (s)	37.4	37.4	37.4		32.2	32.2				7.3		7.3
Actuated g/C Ratio	0.69	0.69	0.69		0.60	0.60				0.14		0.14
v/c Ratio	0.08	0.74	0.03		0.26	0.02				0.23		0.04
Control Delay	3.0	7.4	0.2		6.5	0.0				26.1		0.1
Queue Delay	0.0	0.0	0.0		0.0	0.0				0.0		0.0
Total Delay	3.0	7.4	0.2		6.5	0.0				26.1		0.1
LOS	A	A	A		A	A				C		A
Approach Delay		7.2			6.3							16.8
Approach LOS		A			A							B

Intersection Summary




















Area Type:	Other
Cycle Length:	80
Actuated Cycle Length:	53.9
Natural Cycle:	80
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.74
Intersection Signal Delay:	7.3
Intersection LOS:	A
Intersection Capacity Utilization:	57.7%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 6: TH 5 & Minnewashta Pkwy



Lanes, Volumes, Timings
11: TH 5 & Crimson Bay Rd

05/07/2020

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	1685	0	0	510	10	0	0	1	15	0	1
Future Volume (vph)	20	1685	0	0	510	10	0	0	1	15	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		300	0		0	0		0
Storage Lanes	1		0	0		1	0		1	0		0
Taper Length (ft)	25			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						0.850			0.865		0.992	
Flt Protected	0.950										0.955	
Satd. Flow (prot)	1770	1863	0	0	1863	1583	0	0	1611	0	1765	0
Flt Permitted	0.950										0.955	
Satd. Flow (perm)	1770	1863	0	0	1863	1583	0	0	1611	0	1765	0
Link Speed (mph)		55			55			30			30	
Link Distance (ft)		2678			1979			1141			605	
Travel Time (s)		33.2			24.5			25.9			13.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	1832	0	0	554	11	0	0	1	16	0	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	22	1832	0	0	554	11	0	0	1	0	17	0
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)		12			12			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		Free			Free			Yield			Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	105.4%
ICU Level of Service	G
Analysis Period (min)	15

Measures of Effectiveness

05/07/2020

Network Totals

Number of Intersections	3
Total Delay (hr)	27
Stops (#)	3046
Average Speed (mph)	41
Total Travel Time (hr)	111
Distance Traveled (mi)	4505
Fuel Consumed (gal)	223
Fuel Economy (mpg)	20.2
Unserviced Vehicles (#)	0
Vehicles in dilemma zone (#)	257
Performance Index	35.6

Detailed Measures of Effectiveness

05/07/2020

3: Rolling Acres Rd & TH 5

Direction	EB	WB	NB	SB	All
Future Volume (vph)	978	519	520	514	2531
Control Delay / Veh (s/v)	40	31	18	21	30
Queue Delay / Veh (s/v)	0	0	0	0	0
Total Delay / Veh (s/v)	40	31	18	21	30
Total Delay (hr)	11	4	3	3	21
Stops / Veh	0.86	0.62	0.62	0.72	0.73
Stops (#)	840	320	323	369	1852
Average Speed (mph)	29	31	30	28	30
Total Travel Time (hr)	23	10	8	8	49
Distance Traveled (mi)	659	319	234	234	1446
Fuel Consumed (gal)	46	20	14	15	94
Fuel Economy (mpg)	14.5	16.1	16.8	15.8	15.4
CO Emissions (kg)	3.19	1.39	0.97	1.04	6.58
NOx Emissions (kg)	0.62	0.27	0.19	0.20	1.28
VOC Emissions (kg)	0.74	0.32	0.22	0.24	1.53
Unserviced Vehicles (#)	0	0	0	0	0
Vehicles in dilemma zone (#)	53	14	9	2	78

6: TH 5 & Minnewashta Pkwy

Direction	EB	WB	SB	All
Future Volume (vph)	1741	511	62	2314
Control Delay / Veh (s/v)	7	6	17	7
Queue Delay / Veh (s/v)	0	0	0	0
Total Delay / Veh (s/v)	7	6	17	7
Total Delay (hr)	3	1	0	5
Stops / Veh	0.51	0.42	0.58	0.49
Stops (#)	893	214	36	1143
Average Speed (mph)	47	49	19	47
Total Travel Time (hr)	23	8	1	32
Distance Traveled (mi)	1072	409	16	1497
Fuel Consumed (gal)	55	18	1	74
Fuel Economy (mpg)	19.5	22.3	14.8	20.1
CO Emissions (kg)	3.84	1.28	0.07	5.20
NOx Emissions (kg)	0.75	0.25	0.01	1.01
VOC Emissions (kg)	0.89	0.30	0.02	1.20
Unserviced Vehicles (#)	0	0	0	0
Vehicles in dilemma zone (#)	141	38	0	179

Detailed Measures of Effectiveness

05/07/2020

11: TH 5 & Crimson Bay Rd

Direction	EB	WB	NB	SB	All
Future Volume (vph)	1705	520	1	16	2242
Control Delay / Veh (s/v)	0	0	43	348	3
Queue Delay / Veh (s/v)	0	0	0	0	0
Total Delay / Veh (s/v)	0	0	43	348	3
Total Delay (hr)	0	0	0	2	2
Stops / Veh	0.02	0.00	0.00	1.00	0.02
Stops (#)	35	0	0	16	51
Average Speed (mph)	55	55	11	1	52
Total Travel Time (hr)	25	4	0	2	30
Distance Traveled (mi)	1366	195	0	2	1563
Fuel Consumed (gal)	46	7	0	1	54
Fuel Economy (mpg)	29.5	29.9	NA	1.4	28.8
CO Emissions (kg)	3.24	0.46	0.00	0.09	3.79
NOx Emissions (kg)	0.63	0.09	0.00	0.02	0.74
VOC Emissions (kg)	0.75	0.11	0.00	0.02	0.88
Unserviced Vehicles (#)	0	0	0	0	0
Vehicles in dilemma zone (#)	0	0	0	0	0

Network Totals

Number of Intersections	3
Control Delay / Veh (s/v)	14
Queue Delay / Veh (s/v)	0
Total Delay / Veh (s/v)	14
Total Delay (hr)	27
Stops / Veh	0.43
Stops (#)	3046
Average Speed (mph)	41
Total Travel Time (hr)	111
Distance Traveled (mi)	4505
Fuel Consumed (gal)	223
Fuel Economy (mpg)	20.2
CO Emissions (kg)	15.57
NOx Emissions (kg)	3.03
VOC Emissions (kg)	3.61
Unserviced Vehicles (#)	0
Vehicles in dilemma zone (#)	257
Performance Index	35.6

Traffic Safety Benefit-Cost Calculation



Highway Safety Improvement Program (HSIP) Reactive Project

A. Roadway Description					
Route	TH 5	District	Metro	County	Carver
Begin RP	Park Dr	End RP	East of Crimson Bay Rd	Miles	2.000
Location	TH 5 from 400 ft east of Park Dr to 2000 ft east of Minnewashta Pkwy and Arboretum Dr at Crimson Bay Rd intersection				

B. Project Description			
Proposed Work	Widen TH 5 to a 4 lane west of Rolling Acres Rd to east of Minnewashta Pkwy; Install signal at Minnewashta Pkwy		
Project Cost*	\$13,440,000	Installation Year	2025
Project Service Life	20 years	Traffic Growth Factor	1.3%

* exclude Right of Way from Project Cost

C. Crash Modification Factor	
Fatal (K) Crashes	Reference See other sheets
Serious Injury (A) Crashes	
Moderate Injury (B) Crashes	Crash Type
Possible Injury (C) Crashes	
Property Damage Only Crashes	www.CMFclearinghouse.org

D. Crash Modification Factor (optional second CMF)	
Fatal (K) Crashes	Reference
Serious Injury (A) Crashes	
Moderate Injury (B) Crashes	Crash Type
Possible Injury (C) Crashes	
Property Damage Only Crashes	www.CMFclearinghouse.org

E. Crash Data			
Begin Date	1/1/2016	End Date	12/31/2018 3 years
Data Source	MnDOT		
Crash Severity	< enter target crashes >	< optional 2nd CMF >	
K crashes			
A crashes			
B crashes			
C crashes			
PDO crashes			

F. Benefit-Cost Calculation		
\$15,560,295	Benefit (present value)	B/C Ratio = 1.16
\$13,440,000	Cost	
Proposed project expected to reduce 14 crashes annually, 0 of which involving fatality or serious injury.		

F. Analysis Assumptions

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

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

Real Discount Rate 1.2%
 Traffic Growth Rate 1.3%
 Project Service Life 20 years

G. Annual Benefit

Crash Severity	Crash Reduction	Annual Reduction	Annual Benefit
K crashes	0.00	0.00	\$0
A crashes	0.00	0.00	\$0
B crashes	4.45	1.48	\$311,220
C crashes	9.61	3.20	\$352,513
PDO crashes	26.64	8.88	\$106,568

\$770,301

H. Amortized Benefit

Year	Crash Benefits	Present Value
2025	\$770,301	\$770,301
2026	\$780,361	\$771,108
2027	\$790,553	\$771,916
2028	\$800,878	\$772,724
2029	\$811,337	\$773,534
2030	\$821,933	\$774,344
2031	\$832,668	\$775,155
2032	\$843,542	\$775,967
2033	\$854,559	\$776,780
2034	\$865,719	\$777,593
2035	\$877,026	\$778,408
2036	\$888,480	\$779,223
2037	\$900,083	\$780,039
2038	\$911,838	\$780,856
2039	\$923,747	\$781,674
2040	\$935,811	\$782,493
2041	\$948,033	\$783,313
2042	\$960,414	\$784,133
2043	\$972,957	\$784,954
2044	\$985,664	\$785,777
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
0	\$0	\$0
0	\$0	\$0
0	\$0	\$0
0	\$0	\$0

Total = \$15,560,294

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

**A. Roadway Description**

Route	TH 5	District	Metro	County	Carver
Begin RP	Park Dr	End RP	East of Crimson Bay Rd	Miles	2.000
Location	TH 5 from 400 ft east of Park Dr to 2000 ft east of Minnewashta Pkwy and Arboretum Dr at Crimson Bay Rd intersection				

B. Project Description

Proposed Work	Widen TH 5 to a 4 lane west of Rolling Acres Rd to east of Minnewashta Pkwy; Install signal at Minnewashta Pkwy				
Project Cost*	\$13,440,000	Installation Year	2025		
Project Service Life	20 years	Traffic Growth Factor	1.3%		

* exclude Right of Way from Project Cost

C. Crash Modification Factor

0.24	Fatal (K) Crashes	Reference	CMF ID: 7566		
0.24	Serious Injury (A) Crashes				
0.24	Moderate Injury (B) Crashes	Crash Type	All		
0.24	Possible Injury (C) Crashes				
0.24	Property Damage Only Crashes		www.CMFclearinghouse.org		

D. Crash Modification Factor (optional second CMF)

0.33	Fatal (K) Crashes	Reference	CMF ID: 323		
0.33	Serious Injury (A) Crashes				
0.33	Moderate Injury (B) Crashes	Crash Type	Angle		
0.33	Possible Injury (C) Crashes				
0.33	Property Damage Only Crashes		www.CMFclearinghouse.org		

E. Crash Data

Begin Date	1/1/2016	End Date	12/31/2018	3 years
Data Source	MnDOT			
Crash Severity	All	Angle		
K crashes	0	0		
A crashes	0	0		
B crashes	4	1		
C crashes	11	1		
PDO crashes	33	0		

F. Benefit-Cost Calculation

\$14,026,690	Benefit (present value)	B/C Ratio = 1.05
\$13,440,000	Cost	
Proposed project expected to reduce 13 crashes annually, 0 of which involving fatality or serious injury.		

F. Analysis Assumptions

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

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

Real Discount Rate 1.2%
 Traffic Growth Rate 1.3%
 Project Service Life 20 years

G. Annual Benefit

Crash Severity	Crash Reduction	Annual Reduction	Annual Benefit
K crashes	0.00	0.00	\$0
A crashes	0.00	0.00	\$0
B crashes	3.73	1.24	\$260,820
C crashes	9.07	3.02	\$332,713
PDO crashes	25.21	8.40	\$100,848

\$694,381

H. Amortized Benefit

Year	Crash Benefits	Present Value
2025	\$694,381	\$694,381
2026	\$703,450	\$695,109
2027	\$712,637	\$695,837
2028	\$721,944	\$696,566
2029	\$731,373	\$697,295
2030	\$740,924	\$698,026
2031	\$750,601	\$698,757
2032	\$760,404	\$699,489
2033	\$770,335	\$700,221
2034	\$780,395	\$700,955
2035	\$790,587	\$701,689
2036	\$800,912	\$702,424
2037	\$811,372	\$703,160
2038	\$821,969	\$703,896
2039	\$832,703	\$704,633
2040	\$843,579	\$705,371
2041	\$854,596	\$706,110
2042	\$865,757	\$706,850
2043	\$877,064	\$707,590
2044	\$888,518	\$708,331
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
0	\$0	\$0
0	\$0	\$0
0	\$0	\$0

Total = \$14,026,690

Traffic Safety Benefit-Cost Calculation



Highway Safety Improvement Program (HSIP) Reactive Project

A. Roadway Description

Route	TH 5	District	Metro	County	Carver
Begin RP	Park Dr	End RP	East of Crimson Bay Rd	Miles	2.000
Location	TH 5 from 400 ft east of Park Dr to 2000 ft east of Minnewashta Pkwy and Arboretum Dr at Crimson Bay Rd intersection				

B. Project Description

Proposed Work	Widen TH 5 to a 4 lane west of Rolling Acres Rd to east of Minnewashta Pkwy; Install signal at Minnewashta Pkwy				
Project Cost*	\$13,440,000	Installation Year	2025		
Project Service Life	20 years	Traffic Growth Factor	1.3%		

* exclude Right of Way from Project Cost

C. Crash Modification Factor

0.73	Fatal (K) Crashes	Reference	CMF ID: 292		
0.73	Serious Injury (A) Crashes				
0.73	Moderate Injury (B) Crashes	Crash Type	All		
0.73	Possible Injury (C) Crashes				
1.00	Property Damage Only Crashes		www.CMFclearinghouse.org		

D. Crash Modification Factor (optional second CMF)

1.00	Fatal (K) Crashes	Reference	CMF ID: 293		
1.00	Serious Injury (A) Crashes				
1.00	Moderate Injury (B) Crashes	Crash Type	All		
1.00	Possible Injury (C) Crashes				
0.87	Property Damage Only Crashes		www.CMFclearinghouse.org		

E. Crash Data

Begin Date	1/1/2016	End Date	12/31/2018	3 years
Data Source	MnDOT			
Crash Severity	All	All		
K crashes	0	0		
A crashes	0	0		
B crashes	1	0		
C crashes	2	0		
PDO crashes	0	11		

F. Benefit-Cost Calculation

\$897,296	Benefit (present value)	B/C Ratio = 0.07
\$13,440,000	Cost	
Proposed project expected to reduce 1 crashes annually, 0 of which involving fatality or serious injury.		

F. Analysis Assumptions

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

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

Real Discount Rate 1.2%

Traffic Growth Rate 1.3%

Project Service Life 20 years

G. Annual Benefit

Crash Severity	Crash Reduction	Annual Reduction	Annual Benefit
K crashes	0.00	0.00	\$0
A crashes	0.00	0.00	\$0
B crashes	0.27	0.09	\$18,900
C crashes	0.54	0.18	\$19,800
PDO crashes	1.43	0.48	\$5,720

\$44,420

H. Amortized Benefit

Year	Crash Benefits	Present Value
2025	\$44,420	\$44,420
2026	\$45,000	\$44,467
2027	\$45,588	\$44,513
2028	\$46,183	\$44,560
2029	\$46,786	\$44,606
2030	\$47,397	\$44,653
2031	\$48,016	\$44,700
2032	\$48,643	\$44,747
2033	\$49,279	\$44,794
2034	\$49,922	\$44,841
2035	\$50,574	\$44,887
2036	\$51,235	\$44,934
2037	\$51,904	\$44,982
2038	\$52,582	\$45,029
2039	\$53,269	\$45,076
2040	\$53,964	\$45,123
2041	\$54,669	\$45,170
2042	\$55,383	\$45,218
2043	\$56,106	\$45,265
2044	\$56,839	\$45,312
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
0	\$0	\$0
0	\$0	\$0

Total = \$897,296

Traffic Safety Benefit-Cost Calculation



Highway Safety Improvement Program (HSIP) Reactive Project

A. Roadway Description

Route	TH 5	District	Metro	County	Carver
Begin RP	Park Dr	End RP	East of Crimson Bay Rd	Miles	2.000
Location	TH 5 from 400 ft east of Park Dr to 2000 ft east of Minnewashta Pkwy and Arboretum Dr at Crimson Bay Rd intersection				

B. Project Description

Proposed Work	Widen TH 5 to a 4 lane west of Rolling Acres Rd to east of Minnewashta Pkwy; Install signal at Minnewashta Pkwy		
Project Cost*	\$13,440,000	Installation Year	2025
Project Service Life	20 years	Traffic Growth Factor	1.3%

* exclude Right of Way from Project Cost

C. Crash Modification Factor

0.55	Fatal (K) Crashes	Reference	CMF ID: 9821
0.55	Serious Injury (A) Crashes		
0.55	Moderate Injury (B) Crashes	Crash Type	All
0.55	Possible Injury (C) Crashes		
0.55	Property Damage Only Crashes		www.CMFclearinghouse.org

D. Crash Modification Factor (optional second CMF)

	Fatal (K) Crashes	Reference	
	Serious Injury (A) Crashes		
	Moderate Injury (B) Crashes	Crash Type	
	Possible Injury (C) Crashes		
	Property Damage Only Crashes		www.CMFclearinghouse.org

E. Crash Data

Begin Date	1/1/2016	End Date	12/31/2018	3 years
Data Source	MnDOT			
Crash Severity	All	< optional 2nd CMF >		
K crashes	0			
A crashes	0			
B crashes	1			
C crashes	0			
PDO crashes	0			

F. Benefit-Cost Calculation

\$636,309	Benefit (present value)	B/C Ratio = 0.05
\$13,440,000	Cost	

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

F. Analysis Assumptions

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

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

Real Discount Rate 1.2%
 Traffic Growth Rate 1.3%
 Project Service Life 20 years

G. Annual Benefit

Crash Severity	Crash Reduction	Annual Reduction	Annual Benefit
K crashes	0.00	0.00	\$0
A crashes	0.00	0.00	\$0
B crashes	0.45	0.15	\$31,500
C crashes	0.00	0.00	\$0
PDO crashes	0.00	0.00	\$0

\$31,500

H. Amortized Benefit

Year	Crash Benefits	Present Value
2025	\$31,500	\$31,500
2026	\$31,911	\$31,533
2027	\$32,328	\$31,566
2028	\$32,750	\$31,599
2029	\$33,178	\$31,632
2030	\$33,611	\$31,665
2031	\$34,050	\$31,698
2032	\$34,495	\$31,732
2033	\$34,946	\$31,765
2034	\$35,402	\$31,798
2035	\$35,864	\$31,832
2036	\$36,333	\$31,865
2037	\$36,807	\$31,898
2038	\$37,288	\$31,932
2039	\$37,775	\$31,965
2040	\$38,268	\$31,999
2041	\$38,768	\$32,032
2042	\$39,274	\$32,066
2043	\$39,787	\$32,099
2044	\$40,307	\$32,133
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
0	\$0	\$0
0	\$0	\$0
0	\$0	\$0

Total = \$636,309



CMF / CRF Details

CMF ID: 292

Physical channelization of both major and minor roads

Description:

Prior Condition: *No Prior Condition(s)*

Category: Intersection geometry

Study: [Handbook of Road Safety Measures, Elvik, R. and Vaa, T., 2004](#)

Star Quality Rating:



Crash Modification Factor (CMF)

Value: 0.73

Adjusted Standard Error:

Unadjusted Standard Error: 0.06

Crash Reduction Factor (CRF)

Value: 27 (This value indicates a **decrease** in crashes)

Adjusted Standard Error:

Unadjusted Standard Error: 6

Applicability

Crash Type:	All
Crash Severity:	K (fatal),A (serious injury),B (minor injury),C (possible injury)
Roadway Types:	Not specified
Number of Lanes:	
Road Division Type:	
Speed Limit:	
Area Type:	Rural
Traffic Volume:	
Time of Day:	

If countermeasure is intersection-based

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

Development Details

Date Range of Data Used:	
Municipality:	
State:	
Country:	

Type of Methodology Used:	Meta-analysis
Sample Size Used:	

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

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CMF / CRF Details

CMF ID: 293

Physical channelization of both major and minor roads

Description:

Prior Condition: *No Prior Condition(s)*

Category: Intersection geometry

Study: [Handbook of Road Safety Measures, Elvik, R. and Vaa, T., 2004](#)

Star Quality Rating:



Crash Modification Factor (CMF)

Value: 0.87

Adjusted Standard Error: 0.4

Unadjusted Standard Error: 0.22

Crash Reduction Factor (CRF)

Value: 13 (This value indicates a **decrease** in crashes)

Adjusted Standard Error: 40

Unadjusted Standard Error: 22

Applicability

Crash Type:	All
Crash Severity:	0 (property damage only)
Roadway Types:	Not specified
Number of Lanes:	
Road Division Type:	
Speed Limit:	
Area Type:	Rural
Traffic Volume:	
Time of Day:	

If countermeasure is intersection-based

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

Development Details

Date Range of Data Used:	
Municipality:	
State:	
Country:	

Type of Methodology Used:	Meta-analysis
Sample Size Used:	

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

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CMF / CRF Details

CMF ID: 323

Install a traffic signal (major road speed limit at least 40 mph)

Description: Install a traffic signal (major road speed limit at least 40 mph)

Prior Condition: *No Prior Condition(s)*

Category: Intersection traffic control

Study: [Safety Effects of Left-Turn Phasing Schemes at High-Speed Intersections, Davis and Aul, 2007](#)

Star Quality Rating:



Crash Modification Factor (CMF)

Value: 0.33

Adjusted Standard Error: 0.06

Unadjusted Standard Error: 0.05

Crash Reduction Factor (CRF)

Value: 67 (This value indicates a **decrease** in crashes)

Adjusted Standard Error: 6

Unadjusted Standard Error:

5

Applicability

Crash Type:

Angle

Crash Severity:

All

Roadway Types:

Not Specified

Number of Lanes:

Road Division Type:

Speed Limit:

Area Type:

Urban

Traffic Volume:

Time of Day:

If countermeasure is intersection-based

Intersection Type:

Roadway/roadway (not interchange related)

Intersection Geometry:

4-leg

Traffic Control:

Stop-controlled

Major Road Traffic Volume:

Minor Road Traffic Volume:

Development Details

Date Range of Data Used:

Municipality:

State:

Country:	
Type of Methodology Used:	Before/after using empirical Bayes or full Bayes
Sample Size Used:	

Other Details	
Included in Highway Safety Manual?	Yes. HSM lists this CMF in bold font to indicate that it has the highest reliability since it has an adjusted standard error of 0.1 or less.
Date Added to Clearinghouse:	Dec-01-2009
Comments:	Countermeasure name changed to match HSM

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CMF / CRF Details

CMF ID: 7572

Convert 2 lane roadway to 4 lane divided roadway

Description: Conversion of urban and rural two-lane roadways to four-lane divided roadways

Prior Condition: 2 lane roadway

Category: Roadway

Study: [Evaluation of the Safety Effectiveness of the Conversion of Two-Lane Roadways to Four-Lane Divided Roadways: Bayesian vs. Empirical Bayes, Ahmed et al., 2015](#)

Star Quality Rating:



[\[View score details\]](#)

Crash Modification Factor (CMF)

Value: 0.236

Adjusted Standard Error:

Unadjusted Standard Error: 0.072

Crash Reduction Factor (CRF)

Value: 76.4 (This value indicates a **decrease** in crashes)

Adjusted Standard Error:	
Unadjusted Standard Error:	7.21

Applicability	
Crash Type:	All
Crash Severity:	All
Roadway Types:	Not specified
Number of Lanes:	2
Road Division Type:	Undivided
Speed Limit:	
Area Type:	Urban
Traffic Volume:	18000 <i>Average Daily Traffic (ADT)</i>
Time of Day:	

<i>If countermeasure is intersection-based</i>	
Intersection Type:	
Intersection Geometry:	
Traffic Control:	
Major Road Traffic Volume:	
Minor Road Traffic Volume:	

Development Details	
Date Range of Data Used:	2002 to 2012
Municipality:	

State:	FL
Country:	USA
Type of Methodology Used:	Before/after using empirical Bayes or full Bayes
Sample Size Used:	

Other Details	
Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	Nov-01-2015
Comments:	Applies to roadways with AADT greater than or equal to 18,000

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CMF / CRF Details

CMF ID: 9821

Install right-in-right-out (RIRO) operations at stop-controlled intersections

Description:

Prior Condition: *No Prior Condition(s)*

Category: Access management

Study: [*Safety Effects of Turning Movement Restrictions at Stop-Controlled Intersections, Le et al., 2018*](#)

Star Quality Rating:



[\[View score details\]](#)

Crash Modification Factor (CMF)

Value: 0.55

Adjusted Standard Error:

Unadjusted Standard Error: 0.09

Crash Reduction Factor (CRF)

Value: 45 (*This value indicates a **decrease** in crashes*)

Adjusted Standard Error:

Unadjusted Standard Error:

9

Applicability

Crash Type:

All

Crash Severity:

All

Roadway Types:

Not specified

Number of Lanes:

4 and 6

Road Division Type:

Divided by Median

Speed Limit:

Area Type:

Urban

Traffic Volume:

Time of Day:

All

If countermeasure is intersection-based

Intersection Type:

Roadway/roadway (not interchange related)

Intersection Geometry:

3-leg

Traffic Control:

Stop-controlled

Major Road Traffic Volume:

13433 to 75000 Annual Average Daily Traffic (AADT)

Minor Road Traffic Volume:

51 to 2600 Annual Average Daily Traffic (AADT)

Development Details

Date Range of Data Used:

Municipality:

State:

CA

Country:	USA
Type of Methodology Used:	Regression cross-section
Sample Size Used:	

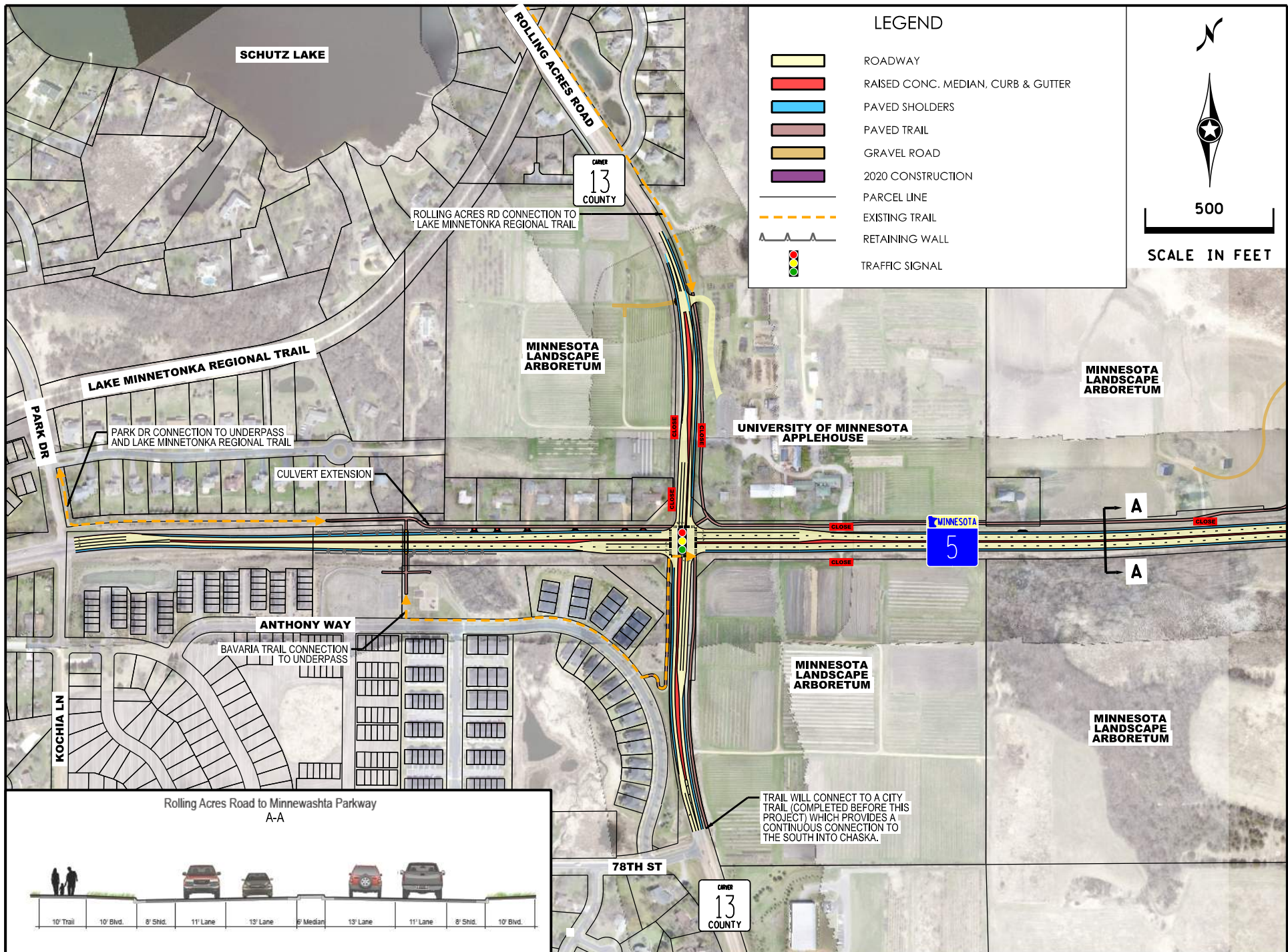
Other Details	
Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	Oct-27-2018
Comments:	This CMF compares urban, three-legged, stop-controlled intersections with RIRO operation to full movement. This CMF looks at Total crashes. Total crashes are defined as all crashes within 100 ft of intersection (all types and severities combined)

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MNTH 5 and CSAH 13 Crash Data 2016-2018

objectid	Incident ID	Date and Time	Crash Severity	Location	Number Killed	Number of Vehicles	Officer Narrative	Manner of Collision	Unit1 Type	Unit1 Vehicle Type	Unit1 Direction
1829955	412791	1/9/2017, 4:10 PM	Minor Injury Crash	Arboretum Dr	0	2	V1 was traveling WB. V2 was traveling EB, and saw a plow truck ent	Front to Rear	Motor Vehicle in Transport	Pickup	Westbound
2338600	358323	6/20/2016, 6:41 PM	Minor Injury Crash	Minnewashta	0	2	V1 WAS TRAVELING WB ON MNTH 5 WHEN V2 PULLED OUT FROM	Angle	Motor Vehicle in Transport	Passenger Car	Westbound
2558483	649261	10/3/2018, 7:55 PM	Possible Injury Crash	Minnewashta	0	2	Vehicle #1 was stopped at the intersection of Hwy 5/Minnewashta I	Angle	Motor Vehicle in Transport	Sport Utility Vehicle	Eastbound
2110501	522180	12/5/2017, 2:10 PM	Minor Injury Crash	RAR/Bavaria	0	2	The driver of Unit 1 stated she was stopped at the light in the south	Angle	Motor Vehicle in Transport	Passenger Car	Southbound
2139472	668779	12/12/2018, 7:44 AM	Possible Injury Crash	RAR/Bavaria	0	2	MNTH 5 AT ROLLING ACRES ROAD, VICTORIA. V/1 WAS SOUTH BOL	Angle	Motor Vehicle in Transport	Sport Utility Vehicle	Southbound
1973949	669177	12/18/2018, 7:26 AM	Possible Injury Crash	RAR/Bavaria	0	2	Unit 1 was NB on Bavaria Road to continue onto Rolling Acres Road.	Other	Motor Vehicle in Transport	Sport Utility Vehicle	Northbound
1881050	318575	1/10/2016, 10:06 AM	Property Damage Only Crash	RAR/Bavaria	0	2	Unit 1 was SB on Rolling Acres Road and moved into the left turn lar	Front to Rear	Motor Vehicle in Transport	Passenger Car	Southbound
1999879	318855	1/11/2016, 8:00 AM	Property Damage Only Crash	RAR/Bavaria	0	3	Unit 3 and Unit 2 were southbound on Rolling Acres Rd approaching	Front to Rear	Motor Vehicle in Transport	Sport Utility Vehicle	Southbound
2183936	419077	1/25/2017, 5:25 AM	Property Damage Only Crash	RAR/Bavaria	0	1	Unit 1 was southbound on Co Rd 13, entered the intersection of HW		Motor Vehicle in Transport	Sport Utility Vehicle	Southbound
2110335	511672	10/26/2017, 8:20 AM	Property Damage Only Crash	RAR/Bavaria	0	1	Unit 1 was traveling southbound on Rolling Acres Road in the city o		Motor Vehicle in Transport	Sport Utility Vehicle	Southbound
2073018	338789	3/28/2016, 7:15 PM	Property Damage Only Crash	RAR/Bavaria	0	1	Unit 1 was towing a 1998 GMC with MN registration 677RYX. Unit :		Motor Vehicle in Transport	Medium / Heavy Trucks (More th	Northbound
1895654	590678	4/13/2018, 9:51 PM	Property Damage Only Crash	RAR/Bavaria	0	2	Vehicle #1 was parked at Rolling Acres/Hwy 5 going to be turning e	Front to Front	Motor Vehicle in Transport	Pickup	Southbound
1829472	347826	5/8/2016, 4:50 PM	Property Damage Only Crash	RAR/Bavaria	0	2	Unit 2 was stopped facing northbound on Bavaria at Highway 5. Uni	Front to Rear	Motor Vehicle in Transport	Pickup	Northbound
1784987	601243	6/1/2018, 12:21 PM	Property Damage Only Crash	RAR/Bavaria	0	2	Unit 1 was NB on Rolling Acres Road and was towing trailer unit 2.	Sideswipe - Same Direction	Motor Vehicle in Transport	Sport Utility Vehicle	Northbound
1830226	469358	6/12/2017, 3:55 PM	Property Damage Only Crash	RAR/Bavaria	0	3	Unit 1 was traveling north bound at the intersection of Bavaria Rd. i	Sideswipe - Opposing	Motor Vehicle in Transport	Passenger Car	Southbound
1842565	367498	7/29/2016, 4:18 PM	Property Damage Only Crash	RAR/Bavaria	0	2	On 07/29/2016 at 1618 hours, I responded to a two vehicle propret	Front to Rear	Motor Vehicle in Transport	Passenger Car	Southbound
2554286	371698	8/15/2016, 7:44 AM	Property Damage Only Crash	RAR/Bavaria	0	2	MNTH 5 AT ROLLING ACRES ROAD. VEHICLE 1 SOUTH ROLLING ACR	Angle	Motor Vehicle in Transport	Passenger Car	Southbound
2579340	330094	2/18/2016, 9:46 AM	Minor Injury Crash	TH 5	0	2	The Taurus was traveling westbound on MNTH 5, and the Equinox v	Angle	Motor Vehicle in Transport	Passenger Car	Westbound
1920221	331983	2/26/2016, 4:15 PM	Minor Injury Crash	TH 5	0	3	On 02/26/16 there was a three vehicle personal injury crash on HW	Front to Rear	Motor Vehicle in Transport	Sport Utility Vehicle	Westbound
1856757	602532	6/6/2018, 10:30 PM	Minor Injury Crash	TH 5	0	3	Unit 2 and Unit 3 were stopped at a red light, eastbound highway 5	Front to Rear	Motor Vehicle in Transport	Pickup	Eastbound
2415098	496502	8/22/2017, 5:44 PM	Minor Injury Crash	TH 5	0	2	BOTH VEHICLES TRAVELING W/B ON HWY 5 APPROACHING BAVARIA	Front to Rear	Motor Vehicle in Transport	Passenger Car	Westbound
2500427	420365	1/24/2017, 5:45 PM	Possible Injury Crash	TH 5	0	3	V1 and V2 were stopped in the single West bound lane of Hwy 5 East	Front to Rear	Motor Vehicle in Transport	Passenger Car	Westbound
2050634	405810	12/18/2016, 4:14 AM	Possible Injury Crash	TH 5	0	2	Unit 1 was traveling eastbound on Highway 5 approaching Minnew	Rear to Side	Motor Vehicle in Transport	Sport Utility Vehicle	Eastbound
2093002	406242	12/19/2016, 3:04 PM	Possible Injury Crash	TH 5	0	2	Veh 1/ Horsch was west in right turn lane waiting for opportunity to	Front to Rear	Motor Vehicle in Transport	Passenger Car	Unknown
1907758	400925	12/7/2016, 7:30 AM	Possible Injury Crash	TH 5	0	2	On 12/7/2016, there was a two vehicle property crash near the inte	Front to Rear	Motor Vehicle in Transport	Pickup	Eastbound
2411773	333929	3/6/2016, 6:17 PM	Possible Injury Crash	TH 5	0	2	The Jeep was being pursued westbound on MNTH 5 near Lone Ceda		Motor Vehicle in Transport	Sport Utility Vehicle	Westbound
2160327	334549	3/9/2016, 1:20 PM	Possible Injury Crash	TH 5	0	2	Driver of Unit #1 was heading westbound on Hwy 5 near Rolling Acr	Front to Rear	Motor Vehicle in Transport	Pickup	Westbound
2475074	445048	4/13/2017, 4:20 PM	Possible Injury Crash	TH 5	0	2	-Crash occurred on Hwy 5 east of Bavaria Rd-both vehicles were WB	Front to Rear	Motor Vehicle in Transport	Passenger Car	Westbound
2236579	452638	5/16/2017, 5:50 PM	Possible Injury Crash	TH 5	0	2	On 05/16/2017 at 1750 hours, deputies were dispatched to a two v	Front to Rear	Motor Vehicle in Transport	Pickup	Westbound
2449866	454821	5/25/2017, 7:10 PM	Possible Injury Crash	TH 5	0	2	Unit 1 was at a red stop light on Hwy 5 near the intersection of Rolli	Front to Rear	Motor Vehicle in Transport	Pickup	Westbound
2216079	625004	8/2/2018, 12:05 PM	Possible Injury Crash	TH 5	0	3	Unit 1 and Unit 2 were traveling westbound on Hwy 5 between Hwn	Front to Rear	Motor Vehicle in Transport	Sport Utility Vehicle	Westbound
2481316	629533	8/22/2018, 6:01 PM	Possible Injury Crash	TH 5	0	3	Vehicle #2 and Vehicle #3 were stopped on Highway 5 heading west	Front to Rear	Motor Vehicle in Transport	Passenger Car	Westbound
1816805	414209	1/11/2017, 11:50 AM	Property Damage Only Crash	TH 5	0	2	V1 and V2 were both EB on Hwy. 5 in the area of Minnewashta Pkw	Angle	Motor Vehicle in Transport	Sport Utility Vehicle	Eastbound
1920149	322806	1/22/2016, 5:48 PM	Property Damage Only Crash	TH 5	0	2	Unit 1 Was travelling EB on Hwy 5 W of CO 13. Unit 2 was stopped	Front to Rear	Motor Vehicle in Transport	Sport Utility Vehicle	Eastbound
2291614	540239	1/24/2018, 7:15 AM	Property Damage Only Crash	TH 5	0	3	V1, V2 and V3 were EB on Hwy. 5, stopped in traffic for the red light	Front to Rear	Motor Vehicle in Transport	Passenger Car	Eastbound
2365530	540970	1/29/2018, 8:00 AM	Property Damage Only Crash	TH 5	0	2	Both units were traveling EB on Hwy 5, East of Co Rd 13. Unit 2 was	Front to Rear	Motor Vehicle in Transport	Passenger Car	Eastbound
1862663	509962	10/19/2017, 4:05 PM	Property Damage Only Crash	TH 5	0	2	Unit 1 and Unit 2 were both traveling westbound on Hwy 5 betwee	Front to Rear	Motor Vehicle in Transport	Pickup	Westbound
2266036	388966	10/24/2016, 8:00 AM	Property Damage Only Crash	TH 5	0	2	P1 was EB on 5 just E of Rolling Acres. P2 was NB on Bavaria turning	Front to Rear	Motor Vehicle in Transport	Sport Utility Vehicle	Eastbound
1901638	517630	11/16/2017, 5:35 PM	Property Damage Only Crash	TH 5	0	3	I was dispatched to a reported property damage crash with no injur	Front to Rear	Motor Vehicle in Transport	Passenger Car	Westbound
2074777	518701	11/19/2017, 4:40 PM	Property Damage Only Crash	TH 5	0	2	The driver of Unit 1 was stopped in the eastbound lane of Highway	Front to Rear	Motor Vehicle in Transport	Sport Utility Vehicle	Eastbound
2050583	397469	11/22/2016, 9:38 PM	Property Damage Only Crash	TH 5	0	1	W/B MNTH 5 AT MINNWASHTA. VEHICLE WEST ON MNTH 5, DRIVEL		Motor Vehicle in Transport	Sport Utility Vehicle	Westbound
2266818	409221	12/26/2016, 1:44 PM	Property Damage Only Crash	TH 5	0	2	Vehicle one stopped at light eastbound. Vehicle two was stopped d	Front to Rear	Motor Vehicle in Transport	Sport Utility Vehicle	Eastbound
1784803	567206	2/19/2018, 7:20 PM	Property Damage Only Crash	TH 5	0	1	Unit 1 was WB on Hwy 5 slowing for the intersection with Rolling Ac		Motor Vehicle in Transport	Passenger Car	Westbound
2506551	568483	2/22/2018, 5:30 PM	Property Damage Only Crash	TH 5	0	2	V1 and V2 were WB on Hwy. 5 approaching Rolling Acres Rd. which	Front to Rear	Motor Vehicle in Transport	Sport Utility Vehicle	Westbound
2211509	326585	2/4/2016, 4:45 PM	Property Damage Only Crash	TH 5	0	3	Driver of Unit #1 was heading westbound on Hwy 5. Driver of Unit	Rear to Rear	Motor Vehicle in Transport	Sport Utility Vehicle	Westbound
1966165	430811	3/21/2017, 4:40 PM	Property Damage Only Crash	TH 5	0	2	V1 and V2 were WB on Hwy. 5 in the area of Minnewashta Pkwy. V	Front to Rear	Motor Vehicle in Transport	Sport Utility Vehicle	Westbound
2211747	338366	3/26/2016, 4:35 PM	Property Damage Only Crash	TH 5	0	2	Unit 2 was stopped for the traffic light westbound on Hwy 5 at Rolli	Front to Rear	Motor Vehicle in Transport	Sport Utility Vehicle	Westbound
2474969	446730	4/21/2017, 4:36 PM	Property Damage Only Crash	TH 5	0	2	Both Units traveling eastbound Hwy 5 in rush hour traffic. Both driv	Front to Rear	Motor Vehicle in Transport	Pickup	Westbound
2577549	455175	5/24/2017, 7:50 AM	Property Damage Only Crash	TH 5	0	2	V1 and V2 were EB on Hwy. 5 approaching Rolling Acres. Traffic beg	Front to Rear	Motor Vehicle in Transport	Sport Utility Vehicle	Eastbound
2241650	601146	5/31/2018, 5:46 PM	Property Damage Only Crash	TH 5	0	2	I had just conducted a traffic stop on westbound Highway 5, east of	Front to Rear	Motor Vehicle in Transport	Sport Utility Vehicle	Westbound
2160805	357252	6/13/2016, 12:05 PM	Property Damage Only Crash	TH 5	0	2	D1 stated he was stopped at the stoplight at Hwy. 5/Rolling Acres. C	Front to Rear	Motor Vehicle in Transport	Passenger Van (Seats Installed Be	Unknown
1843168	471829	6/19/2017, 5:45 PM	Property Damage Only Crash	TH 5	0	2	The driver of Unit 1 stated he was slowing in the eastbound lane of	Front to Rear	Motor Vehicle in Transport	Passenger Car	Eastbound
2578323	474975	6/30/2017, 4:34 PM	Property Damage Only Crash	TH 5	0	2	WB MNTH 5 AT BAVARIA ROADV2 STATED THAT SHE WAS TRAVELII	Front to Rear	Motor Vehicle in Transport	Sport Utility Vehicle	Westbound
2093789	457154	6/4/2017, 7:15 PM	Property Damage Only Crash	TH 5	0	2	P1, blue Subaru Outback, was sitting at the stop light facing eastbo	Front to Rear	Motor Vehicle in Transport	Sport Utility Vehicle	Eastbound
2532046	608143	7/1/2018, 4:29 AM	Property Damage Only Crash	TH 5	0	1	V1 left roadway and hit marker sign then end of guardrail, peeling l	Front to Rear	Motor Vehicle in Transport	Passenger Car	Westbound
1882031	486439	7/11/2017, 5:45 PM	Property Damage Only Crash	TH 5	0	2	Ringstrom was at the stoplight on 5 at Rolling acres eastbound. Moe	Sideswipe - Same Direction	Motor Vehicle in Transport	Passenger Car	Eastbound
2552594	490892	7/31/2017, 3:55 PM	Property Damage Only Crash	TH 5	0	2	Unit 1 was stopped at a red traffic light east bound on Hwy 5 at the	Front to Rear	Motor Vehicle in Transport	Passenger Car	Eastbound
2072297	474972	7/6/2017, 5:30 PM	Property Damage Only Crash	TH 5	0	3	I was dispatched to a multi-vehicle crash on MN Hwy 5 westbound i	Front to Rear	Motor Vehicle in Transport	Sport Utility Vehicle	Westbound
2240353	373457	8/22/2016, 5:29 PM	Property Damage Only Crash	TH 5	0	3	V1 had been slowing in traffic into the sun. V2 rear ended V1, then	Front to Rear	Motor Vehicle in Transport	Passenger Car	Westbound
1868578	373640	8/23/2016, 7:32 AM	Property Damage Only Crash	TH 5	0	2	-CRASH AT HWY 5/CR 13-DV1 MAKING LEFT TURN FROM SB CR 13 T	Angle	Motor Vehicle in Transport	Sport Utility Vehicle	Eastbound
2216868	629981	8/24/2018, 4:15 PM	Property Damage Only Crash	TH 5	0	2	On August 24, 2018 at approximately 1608 hours, vehicle 1 and veh	Front to Rear	Motor Vehicle in Transport	Passenger Car	Westbound
1973098	501614	9/15/2017, 2:55 PM	Property Damage Only Crash	TH 5	0	2	Rose and Sauebrey were both in their respective vehicles stopped ir	Front to Rear	Motor Vehicle in Transport	Sport Utility Vehicle	Eastbound
1894138	380150	9/19/2016, 6:20 AM	Property Damage Only Crash	TH 5	0	1	I was dispatched to a vehicle vs deer near the intersection of highw		Motor Vehicle in Transport	Sport Utility Vehicle	Eastbound
2479201	377194	9/7/2016, 8:30 AM	Property Damage Only Crash	TH 5	0	2	On 09/07/2016, there was a two vehicle property damage crash nei	Front to Rear	Motor Vehicle in Transport	Passenger Car	Eastbound
2526614	499880	9/8/2017, 5:00 PM	Property Damage Only Crash	TH 5	0	2	Unit 1 was travelling W/B on Hwy 5 just east of Rolling Acres. Unit 2	Front to Rear	Motor Vehicle in Transport	Passenger Car	Westbound







**Carver County
Public Works**

11360 Highway 212, Suite 1
Cologne, MN 55322

May 15, 2020

Elaine Koutsoukos
TAB Coordinator
METROPOLITAN COUNCIL
390 Robert St. N
St. Paul, MN 55101

SUBJECT: Highway 5 Arboretum Area Mobility and Access Improvement Project Risk Assessment Layout Approval Letter

Dear Ms. Koutsoukos:

This letter is to confirm the County's agreement with and approval to date of the attached layout for the Highway 5 Arboretum Area Mobility and Access Improvement Project between Park Dr./Kochia Ln. and Crimson Bay Rd. and including improvements to the intersection of TH 5 and CSAH 13 (Rolling Acres Rd.). The project has undergone substantial study and coordination with project partners. The County led and partnered on the development of the layout with MnDOT, the Minnesota Landscape Arboretum (University of MN), and the Cities of Victoria, Chanhassen, and Chaska through the Arboretum Area Transportation Plan corridor study planning process, and we are aware of the details specified in the application attachment.

The Minnesota Landscape Arboretum (University of MN) provided a letter of support and is a key partner on the project, as TH 5 provides the only access and connection to this regional destination. As a roadway owner, MnDOT also provided the required letter of support for the project. We expect the Cities of Victoria and Chanhassen to also submit letters of support for the project, as we have been in ongoing and recent communication and coordination with the staff and City Councils.

The County is committed to working with MnDOT, the MN Landscape Arboretum (University of MN), and the Cities of Victoria and Chanhassen to complete the final layout approval engineering process for the Highway 5 Arboretum Area Mobility and Access Improvement Project in the coming months.

Sincerely,

Lyndon Robjent, P.E.
Public Works Director/County Engineer

CARVER COUNTY

UNIVERSITY OF MINNESOTA

Minnesota Landscape Arboretum

*3675 Arboretum Drive
Chaska, MN 55318-9613*

*Office: 952-443-1400
Fax: 612-301-1274
www.arboretum.umn.edu*

April 23, 2020

Lyndon Robjent, P.E.
Public Works Director, County Engineer
Carver County Public Works
11360 Highway 212, Suite 1, Cologne, MN 55322

Dear Mr. Robjent,

The MN Landscape Arboretum is pleased to support Carver County's application for the Highway 5 Arboretum Area Mobility and Access Improvement between Rolling Acres Road (CSAH 13) and Minnewashta Parkway to the Metropolitan Council's 2020 Regional Solicitation for federal transportation funding. Many Arboretum visitors have contacted me about the safety issues related to the existing 2 lane (TH) 5.

The MN Landscape Arboretum partnered with Carver County, the Minnesota Department of Transportation (MnDOT), the City of Victoria, the City of Chanhassen, and the City of Chaska, on the Arboretum Area Transportation Plan corridor study to identify coordinated roadway improvements to address significant existing transportation mobility, safety, and access issues on the State Trunk Highway (TH) 5 corridor. The Arboretum Area Transportation Plan corridor study included a robust technical analysis, concept development, concept evaluation, and a diversified and broad public engagement strategy to identify and build consensus for short and long-term roadway concepts and recommendation.

The MN Landscape Arboretum is supportive of Carver County's application seeking federal transportation funds to reconstruct and expand State Trunk Highway (TH) 5 from a two-lane rural highway to a four-lane divided expressway between Rolling Acres Road (CSAH 13) and Minnewashta Parkway including intersection safety and access improvements and bicycle and pedestrian accommodations. The proposed improvements will most significantly address safety and mobility issues identified in MnDOT's Congestion Management Safety Plan at the TH 5/Rolling Acres Road (CSAH 13) intersection, provide safe and reliable regional access to the MN Landscape Arboretum, and improve safety and reliability for all corridor users. The project is consistent with the MN Landscape Arboretum's long-term vision and immediate need to provide safer access to this regional and national destination for the nearly half-million annual visitors.

The proposed project is endorsed by the MN Landscape Arboretum, and we are supportive of the County's applications to the Metropolitan Council's 2020 Regional Solicitation funding program.

Sincerely,



Signature

Peter C. Moe - Arboretum Director

Driven to DiscoverSM



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

May 12, 2020

Lyndon Robjent, PE
Public Works Director, County Engineer
Carver County Public Works
11360 Highway 212, Suite 1
Cologne, MN 55322

**Re: MnDOT Letter for Carver County
Metropolitan Council/Transportation Advisory Board 2020 Regional Solicitation Funding
Request for Carver County proposed projects on the TH system**

Dear Lyndon Robjent,

This letter documents MnDOT Metro District's recognition for Carver County to pursue funding for the Metropolitan Council/Transportation Advisory Board's (TAB) 2020 Regional Solicitation for the following projects:

- TH 212 Expansion from CSAH 51 to CSAH 36 W. Project to expand the existing rural two-lane undivided highway to a four-lane divided expressway and implement Reduced Conflict Intersections and wider shoulders.
- TH 212/CSAH 51 Intersection Spot Mobility. An improvement to add a Reduced Conflict Intersection at this location with a 4-lane divided facility on TH 212 through the intersection area.
- TH 5 Expansion from CSAH 13 to Minnewashta Pkwy. Project expands TH 5 to a 4-lane divided facility between CSAH 13 (Rolling Acres Rd.) and Minnewashta Pkwy, including intersection improvements at CSAH 13 and at Minnewashta Pkwy.
- CSAH 10 Expansion from Bavaria Rd. to Park Ridge Dr. , which Includes the TH 41 Intersection. Expansion of CSAH 10/Engler Blvd. to a 4-lane divided highway between Bavaria Rd. and Park Ridge Dr. including improvements at these intersections. The TH 41/CSAH 10 intersection (traffic signal) will be expanded as part of this project.

As proposed, these projects impact MnDOT right-of-way on TH5, TH 41, and TH 212. As the agency with jurisdiction over these highways, MnDOT will allow Carver County to seek improvements proposed. If funded, details of any future maintenance agreement with Carver County will need to be determined during project development to define how the improvements will be maintained for the projects' useful life.

There is no funding from MnDOT currently planned or programmed for these projects. Due to expected loss of future state and federal transportation revenues as a result of the COVID-19 pandemic, there is

likely to be significant disruptions to the current MnDOT construction program that will surface in the next year. MnDOT does not anticipate partnering on local projects beyond current agreements.

In addition, at this time the Metro District does not anticipate any significant discretionary funding in state fiscal years 2024 or 2025 that could fund project construction, nor do we have the resources to assist with MnDOT services such as the design or construction engineering of the projects. If projects receives funding, continue to work with MnDOT Area staff to coordinate project development and to periodically review needs and opportunities for cooperation.

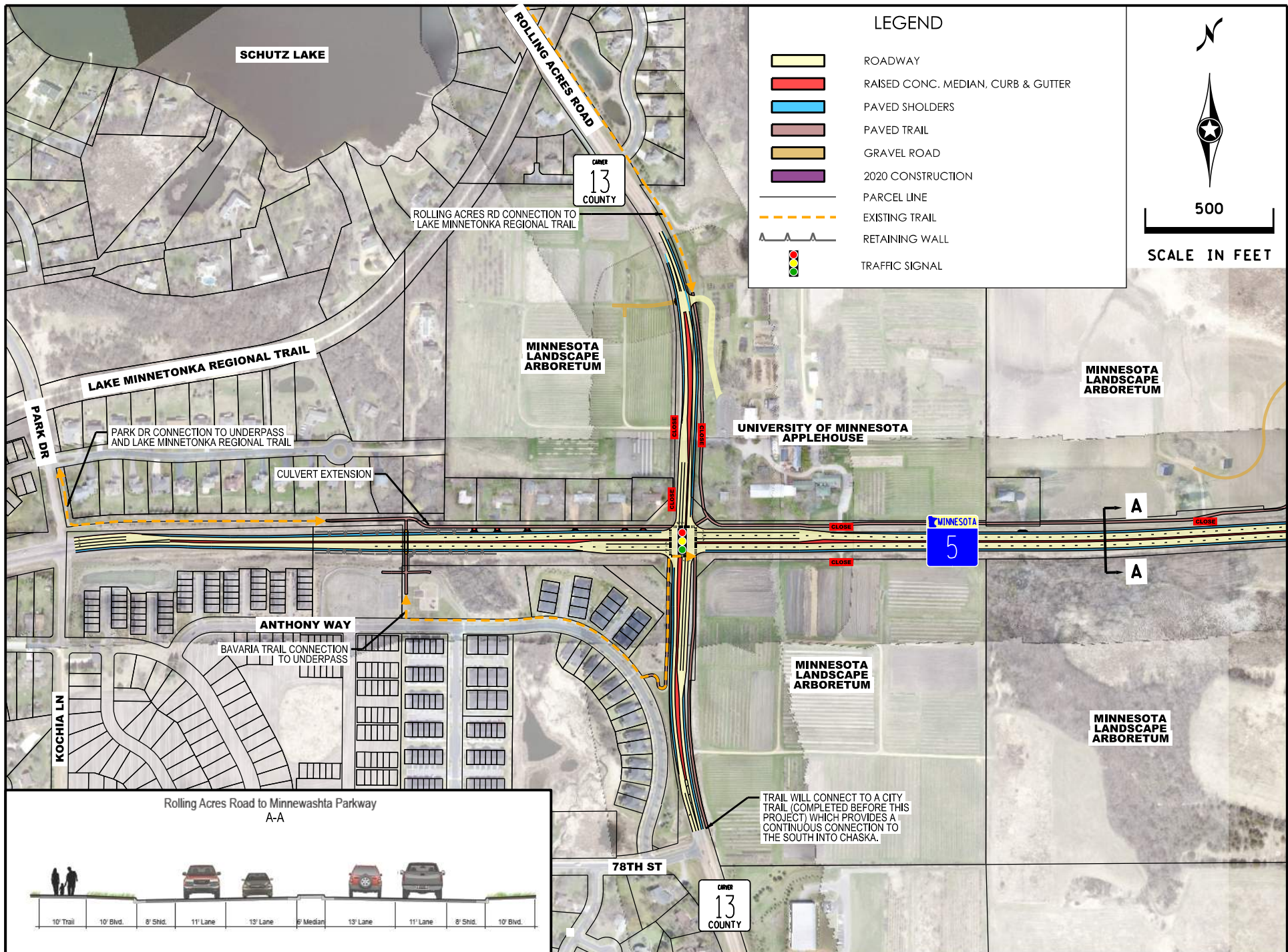
MnDOT Metro District looks forward to continued cooperation with Carver County as these projects move forward and as we work together to improve safety and travel options within the Metro Area.

If you have questions or require additional information at this time, please reach out to Mark Lindeberg, South Area Manager, at mark.lindeberg@state.mn.us or 651-234-7729.

Sincerely,

Michael Barnes, PE
Metro District Engineer

CC: Mark Lindeberg, Metro District South Area Manager
Molly McCartney, Metro Program Director
Dan Erickson, Metro State Aid Engineer







Applicant, Location, &

Route: Carver County, Highway 5 in the cities of Chanhassen and Victoria, west of Highway 41



Application Category:

Strategic Capacity – Roadway Expansion



Funding Information:

Requested Award Amount: \$10,000,000
Local Match: \$3,440,000
Project Total: \$13,440,000



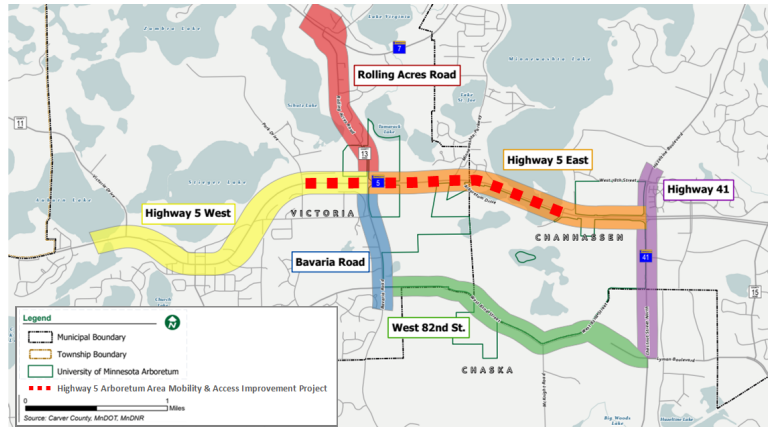
Additional Funding Sources:

- Carver County Transportation Sales Tax Revenue



Project Benefits:

- Expansion of Highway 5 resulting in decreased congestion
- Relocated Arboretum access providing a safe and reliable entry to the Arboretum
- Access management / Crash reduction / Safety improvements
- New traffic signal and improved side street mobility
- New bicycle and pedestrian shared use paths, with linkage to regional destinations, parks and trails
- New bicycle and pedestrian underpass west of CSAH 13 linking neighborhoods and park to regional system



Note: This figure depicts the extent of the Arboretum Area Transportation Plan, an ongoing area transportation study started in 2019 with expected completion in 2020.

Project Description

TH 5 is a congested (28,500 vehicles/day) 2-lane undivided A-Minor Expander road. The project segment has a critical crash index nearly 3 times the statewide average. During peak periods and also during Minnesota Landscape Arboretum events, traffic backs up several miles. Turning onto Hwy 5 is very difficult at times due to speeds and limited gaps, resulting in motorists making risky decisions. This project includes strategic highway expansion (2- to 4-lane conversion) in the vicinity of the Arboretum, relocation of the Arboretum access, a new traffic signal at Minnewashta Parkway, regional trail and a grade separated pedestrian crossing. These changes will alleviate congestion, improve access to the Arboretum and neighborhoods, improve safety, and knit together a regional trail network.



Project Benefits

The project will improve the safety of Highway 5 and alleviate congestion issues. It includes new trails linking to existing facilities, augmented at-grade pedestrian crossings and a new underpass linking the south side of Victoria to the local and regional trail network. The new signal at Minnewashta Pkwy will enable reconfiguration of the main Arboretum entrance to this location which will benefit access for all visitors and employees. The Arboretum currently welcomes half a million visitors annually and has plans to grow visitation as part of its strategic plan. The change to the CSAH 13 signal will alleviate a documented safety problem identified in MnDOT’s Congestion Management and Safety Plan.

Project Development and Status

This project is the culmination of the past 15 months of collaboration with many stakeholder groups and extensive public engagement, working closely with the Minnesota Landscape Arboretum and University of Minnesota. Project partners include MnDOT, Carver County, the Cities of Chanhassen, Chaska, and Victoria, as well as the Arboretum. The study is not yet complete, but this project has risen to the top of priorities based on need, support, and the tremendous impact this will have on safety and performance to the Highway 5 corridor. This project has the full support of all partners noted above.

