Application

10354 - 2018 Roadway Modernization

11039 - TH 169/TH 47 and TH 10 Interchange Modernization Project in Anoka, MN

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:	STATE OF MN

Jurisdictional Agency (if different):	
Organization Type:	State Government
Organization Website:	
Address:	MN DOT MS725 1500 W COUNTY RD B2 #250
*	ROSEVILLE (City) Minnesota (State/Province) 55113 (Postal Code/Zip)
County:	Ramsey
Phone:*	651-366-3452 Ext.
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PeopleSoft Vendor Number	0000024577A36

Project Information

Project Name	TH 169/TH 47 and TH 10 Interchange Modernization Project in Anoka, MN
Primary County where the Project is Located	Anoka
Cities or Townships where the Project is Located:	Anoka
Jurisdictional Agency (If Different than the Applicant):	

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

This application is for a modified/modernized interchange on TH 169/TH 47 at TH 10. Trunk Highways 169 and 10 are both Principal Arterials and TH 47 is an A-Minor Connector. All roads are identified as tiered freight corridors in the Metropolitan Council?s Regional Truck Freight Highway Corridor Study (2017). TH 10 is a Tier One corridor, TH 169 is Tier Two, and TH 47 is Tier Three.

The westbound exit ramp from TH 10 to TH 169/TH 47 is only 530? long. During the morning peak hour, the average queue of 225 feet is contained on the ramp, however, maximum queues extend up to 1,375 feet. During the afternoon peak hour both the average and maximum queues extend onto TH 10, at 825 feet and 2,675 feet respectively. Left turning traffic at the eastbound ramp of TH 47 and TH 10 operates at LOS F during the morning peak hour, with an average delay is over 1 minute per vehicle. Due to the lack of performance at this interchange, a thousand vehicles a day use other routes during peak traffic hours, thus pushing regional traffic onto routes not intended for this function.

Between 2013 and 2015, there were 68 crashes at the eastbound TH 10 ramp and TH 47 intersection. Over half of these were rear-end crashes. The majority involved northbound vehicles. The crash index at this location is 1.61. Compared to similar intersections statewide, this intersection operates outside the normal range with a crash rate that is 2.4 times higher than the statewide average for similar intersections.

The TH 169/TH 47 and TH 10 interchange project will replace the existing diamond interchange with a single point urban interchange (SPUI). This new interchange will enhance traffic operations,

increase capacity, and improve roadway safety. The project will improve overall access to this part of Anoka, including the downtown, located less than ½ mile south of the interchange and the City?s Northstar Transit Station. The project will also update existing pedestrian and bicycle facilities by providing continuous sidewalk along TH 169/TH 47.

This project is the result of MnDOT?s TH 169/TH 47/Ferry St and TH 10 Interchange Improvements Study, the results of which will be published in summer 2018.

(Limit 2,800 characters; approximately 400 words)

TIP Description Guidance (will be used in TIP if the project is selected for funding)

US 169/MN 47 (from Pleasant St to Clay St) and US 10 interchange reconstruct.

Project Length (Miles)

0.52

to the nearest one-tenth of a mile

Project Funding

Are you applying for competitive funds from another source(s) to implement this project?

No

If yes, please identify the source(s)

Federal Amount

$7,000,000.00

Match Amount

$20,130,969.00

Minimum of 20% of project total

Project Total

$27,130,969.00

Match Percentage

74.2%

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

Source of Match Funds

MnDOT

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:

2022

Select 2020 or 2021 for TDM projects only. For all other applications, select 2022 or 2023.

Additional Program Years:

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

Project Information-Roadways

County, City, or Lead Agency	Minnesota Department of Transportation
Functional Class of Road	Trunk Highway = Principal Arterial Trunk Highway = Principal Arterial Trunk Highway = A-Minor Connector
Road System *TH, CSAH, MSAS, CO. RD., TWP. RD., CITY STREET*	TH
Road/Route No. *i.e., 53 for CSAH 53*	169
Name of Road *Example; 1st ST., MAIN AVE*	US 169, MN 47, FERRY ST, US 10
Zip Code where Majority of Work is Being Performed	55303
(Approximate) Begin Construction Date	01/03/2022
(Approximate) End Construction Date	10/25/2024

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

From: **(Intersection or Address)**	TH 47 and Pleasant St
To: **(Intersection or Address)** *DO NOT INCLUDE LEGAL DESCRIPTION*	TH 169 and Clay St
Or At	
Primary Types of Work *Examples: GRADE, AGG BASE, BIT BASE, BIT SURF, SIDEWALK, CURB AND GUTTER,STORM SEWER, SIGNALS, LIGHTING, GUARDRAIL, BIKE PATH, PED RAMPS, BRIDGE, PARK AND RIDE, ETC.*	

BRIDGE/CULVERT PROJECTS (IF APPLICABLE)

Old Bridge/Culvert No.:	9713
New Bridge/Culvert No.:	
Structure is Over/Under **(Bridge or culvert name):**	

Requirements - All Projects

All Projects

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

List the goals, objectives, strategies, and associated pages:

Goal: Transportation System Stewardship (pg 58).
Objective: A) Efficiently preserve and maintain the regional transportation system in a state of good repair (pg 58).

Strategy: A1) Regional transportation partners will place the highest priority for transportation investments on strategically preserving, maintaining, and operating the transportation system. (pg 2.6).

Goal: Access to Destinations (pg 62

Objective: B) Increase travel time reliability and predictability for travel on highway and transit systems. (pg. 62)

Strategies: C7) Regional transportation partners will manage and optimize the performance of the principal arterial system as measured by person throughput (pg 2.9).

C10) Regional transportation partners will manage access to principal and A-minor arterials to preserve and enhance their safety and capacity. The Council will work with MnDOT to review interchange requests for the principal arterial system (pg 2.9).

C19) The Council and MnDOT should work together with cities and counties to provide efficient connections from major freight terminals and facilities to the regional highway system, including the federally designated Primary Freight Network (pg 2.10).

Goal: Competitive Economy (pg 64)

Objectives: C) Support the region?s economic competitiveness through the efficient movement of freight (pg 64).

Strategies: D2). The Council will coordinate with other agencies planning and pursuing transportation investments that strengthen connections to other regions in Minnesota and the Upper Midwest, the nation, and world including intercity bus and passenger rail, highway corridors, air service, and freight infrastructure (pg 2.11).

D5) The Council and MnDOT will work with transportation partners to identify the impacts of highway congestion on freight and identify cost-effective mitigation (pg 2.11).

Goal: Leveraging Transportation Investment to Guide Land Use (pg 70)

Objective: B) Maintain adequate highway, riverfront, and rail-accessible land to meet existing and future demand for freight movement (pg 70).

Strategy: F3) Metropolitan Council, MnDOT, and local governments will plan, build, operate, maintain, and rebuild an adequate system of interconnected highways and local roads.

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.

- Anoka 2030 Comprehensive Plan ? pages: 175, 176, 183, 185, 189

- Anoka County 2030 Transportation Plan ? pages: 2.1, 2.2, 2.3, 2.4

List the applicable documents and pages:

- City of Anoka Capital Improvements Plan ? page 4, 12, 13

-TH 169/TH 47/Ferry St and TH 10 Interchange Improvements Study to be published summer 2018

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 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.
***Roadway Expansion:** $1,000,000 to $7,000,000*
***Roadway Reconstruction/ Modernization Modernization and Spot Mobility:** $1,000,000 to $7,000,000*
***Traffic Management Technologies (Roadway System Management):** $250,000 to $7,000,000*
***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, or be substantially working towards, completing 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 applicant is a public agency that employs 50 or more people and has an adopted ADA transition plan that covers the public right of way/transportation.

01/01/2015

Date plan adopted by governing body

The applicant is a public agency that employs 50 or more people and is currently working towards completing an ADA transition plan that covers the public rights of way/transportation.

Date process started

Date of anticipated plan completion/adoption

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

Date self-evaluation completed

The applicant is a public agency that employs fewer than 50 people and is working towards completing an ADA self-evaluation that covers the public rights of way/transportation.

Date process started

Date of anticipated plan completion/adoption

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

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 projects only:

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

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

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. Yes

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

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

6. The bridge must have a sufficiency rating less than 80 for rehabilitation projects and less than 50 for replacement projects. Additionally, the bridge must also be classified as structurally deficient or functionally obsolete.

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

Roadway Expansion, Reconstruction/Modernization and Spot Mobility, 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.

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)	$951,950.00
Removals (approx. 5% of total cost)	$763,278.00
Roadway (grading, borrow, etc.)	$810,728.00
Roadway (aggregates and paving)	$1,771,093.00
Subgrade Correction (muck)	$0.00
Storm Sewer	$1,000,000.00
Ponds	$0.00
Concrete Items (curb & gutter, sidewalks, median barriers)	$231,792.00
Traffic Control	$2,855,850.00
Striping	$95,195.00
Signing	$470,195.00
Lighting	$300,000.00
Turf - Erosion & Landscaping	$951,950.00
Bridge	$7,744,500.00
Retaining Walls	$2,570,400.00
Noise Wall (not calculated in cost effectiveness measure)	$3,183,300.00

Traffic Signals	$350,000.00
Wetland Mitigation	$0.00
Other Natural and Cultural Resource Protection	$0.00
RR Crossing	$0.00
Roadway Contingencies	$2,855,850.00
Other Roadway Elements	$0.00
Totals	**$26,906,081.00**

Specific Bicycle and Pedestrian Elements

CONSTRUCTION PROJECT ELEMENTS/COST ESTIMATES	Cost
Path/Trail Construction	$0.00
Sidewalk Construction	$224,888.00
On-Street Bicycle Facility Construction	$0.00
Right-of-Way	$0.00
Pedestrian Curb Ramps (ADA)	$0.00
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	$0.00
Totals	**$224,888.00**

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	$27,130,969.00
Construction Cost Total	$27,130,969.00
Transit Operating Cost Total	$0.00

Congestion on adjacent Parallel Routes:

Adjacent Parallel Corridor	County Road 7/7th Ave
Adjacent Parallel Corridor Start and End Points:	
Start Point:	TH 10
End Point:	Grant Street
Free-Flow Travel Speed:	31
The Free-Flow Travel Speed is black number.	
Peak Hour Travel Speed:	21
The Peak-Hour Travel Speed is red number.	
Percentage Decrease in Travel Speed in Peak Hour Compared to Free-Flow (calculation):	32.26%
Upload the "Level of Congestion" map:	1531408334125_TH 169 Ferry St Interchange Congestion Combined.pdf

Principal Arterial Intersection Conversion Study:

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

(65 Points)

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

(55 Points)

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

(45 Points)

Not listed as a priority in the study: Yes

(0 Points)

Congestion Management and Safety Plan IV:

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

(65 Points)

Not listed as a CMSP priority location:

(0 Points)

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

Existing Employment within 1 Mile: 12817

Existing Manufacturing/Distribution-Related Employment within 1 Mile: 3677

Existing Post-Secondary Students within 1 Mile: 0

Upload Map 1531408494531_TH 169 Ferry St Interchange Econ Compiled.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: Yes

Along Tier 2: Yes

Along Tier 3: Yes

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 10

Current AADT Volume 66000

Existing Transit Routes on the Project 805, 887

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

Upload Transit Connections Map *Please upload attachment in PDF form.*	1531414769265_TH 169 Ferry St Interchange Transit Combined.pdf

Response: Current Daily Person Throughput

Average Annual Daily Transit Ridership	0
Current Daily Person Throughput	85800.0

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	2030 Twin Cities Regional Model with 2040 Trip Tables, City of Anoka
Forecast (2040) ADT volume	85600

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

Select one:

Project located in Area of Concentrated Poverty with 50% or more of residents are people of color (ACP50): *(up to 100% of maximum score)*	
Project located in Area of Concentrated Poverty: *(up to 80% of maximum score)*	
Projects census tracts are above the regional average for population in poverty or population of color: *(up to 60% of maximum score)*	Yes
Project located in a census tract that is below the regional average for population in poverty or populations of color or includes children, people with disabilities, or the elderly: *(up to 40% of maximum score)*	

1.(0 to 3 points) A successful project is one that has actively engaged low-income populations, people of color, children, persons with disabilities, and the elderly during the project's development with the intent to limit negative impacts on them and, at the same time, provide the most benefits.
Describe how the project has encouraged or will engage the full cross-section of community in decision-making. Identify the communities to be engaged and where in the project development process engagement has occurred or will occur. Elements of quality engagement include: outreach 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 the community engagement related to transportation projects; residents or users identifying potential positive and negative elements of the project; and surveys, 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:

Additional public engagement opportunities will be planned as the project is developed. MnDOT will engage with the general public as well as distinct groups of users regarding their use of the TH 169/TH 47 and TH 10 interchange. Affected communities and the public are expected to include federal, state, regional, county and city agencies; neighborhood groups; businesses and business associations; advocacy groups; property owners/tenants; and other tenants. MnDOT will work to identify strategies to engage groups that have been historically underrepresented during the transportation planning process. The intent of engaging with these groups is to achieve active involvement through the project development process.

Outreach and engagement strategies, along with engagement goals and measures will be documented in an engagement report. It is anticipated at a variety of engagement activities will be considered including, but not limited to, open house meetings, neighborhood group presentations, pop up events, and small group meetings.

Feedback received as a result of outreach and engagement events will be compiled and shared with the project team. This feedback will be key in identifying project needs and shaping solutions.

(Limit 1,400 characters; approximately 200 words)

2.(0 to 7 points) Describe the projects benefits to low-income populations, people of color, children, people with disabilities, and the elderly. Benefits could relate to safety; public health; access to destinations; travel time; gap closure; leveraging of other beneficial projects and investments; and/or community cohesion. Note that this is not an exhaustive list.

Response:

TH 169/TH 47 is one of four main north/south connections in the City of Anoka, connecting neighborhoods and resources that are divided by Hwy 10. The project is located in a census tract that is above the regional average for population in poverty or population of color. Underserved residents will benefit from improved access and reduced congestion and delay times. Access improvements facilitate easier or more direct access to employment opportunities and community resources. Current congestion degrades air quality in the project area.

Planned improvements will reduce vehicle travel times. The proposed interchange will allow traffic to flow, decreasing travel times. Reduced travel time will benefit cars, freight, and public transportation users through improved reliability of travel times and speeds. The planned improvements will increase safety by reducing the number of crashes.

Sidewalks provided on TH 169 and TH 47 will enhance the City's non-motorized transportation, improving the connection to downtown Anoka to the south of the interchange, as well as the Northstar Transit Station located at just to the east of the interchange, across the Rum River at Pleasant/Pierce St and 4th Ave. This station is also served by Anoka County?s Traveler Network Route 805 buses.

The project supports currently funded roadway improvements identified in the Highway 10 Access Planning Study, including the overall Hwy 10 Safety and Access Project that extends from the western City limit of Anoka to Main Street. This includes the intersection at Hwy 10 and Fairoak Ave, which received $7M during the 2016 round of the

Regional Solicitation program. Funding this Hwy 10 and Hwy 169/Ferry Street interchange project will further maximize the benefit of public investment along this critical regional corridor. Ideally, all improvements will be constructed in continuous phasing to use resources efficiently and to minimize disruptions to regional traffic, local businesses and residents.

(Limit 2,800 characters; approximately 400 words)

3.(-3 to 0 points) Describe any negative externalities created by the project along with measures that will be taken to mitigate them. Negative externalities can result in a reduction in points, but mitigation of externalities can offset reductions.
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.
Construction/implementation impacts such as dust; noise; reduced access for travelers and to businesses; disruption of utilities; and eliminated street crossings. These tend to be temporary.
Other

Response:

The project is not anticipated to result in negative externalities relative to pedestrian and/or bicycle access or air quality. The project will improve pedestrian and bicycle access considerably over existing conditions. The project will help to improve air quality by addressing congestion at the interchange of TH 169/TH 47 and TH 10, and thereby reduce the number of idling vehicles. Addressing the congestion will improve safety by minimizing or eliminating conditions that contribute to rear end crashes. However, these improvements are anticipated to relieve congestion and increase speeds.

This project will involve residential and business displacements to construct the new access road, proposed road and sidewalk alignment. The project is currently expected to affect five properties.

Noise impacts will be assessed as part of a future NEPA/MEPA process. Any impacts will be addressed and mitigated with appropriate measures, including installation of noise walls where warranted.

Volumes are assumed to be increased with the construction of this project as currently nearly a thousand trips are found to use alternative routes avoiding the interchange today during peak hours. Due to the operational improvements with the project this cut-through traffic would be added back to the interchange in the future.

(Limit 2,800 characters; approximately 400 words)

Upload Map

1531408825890_TH 169 Ferry St Interchange Socio Econ Combined.pdf

Measure B: Affordable Housing

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
Anoka	0.52	1.0	83.0	83.0

Total Project Length

Total Project Length (as entered in the "Project Information" form)	0.52

Affordable Housing Scoring

Total Project Length (Miles) or Population	0.52
Total Housing Score	83.0

Affordable Housing Scoring

Measure A: Year of Roadway Construction

Year of Original Roadway Construction or Most Recent Reconstruction	Segment Length	Calculation	Calculation 2
1964	0.52	1021.28	1964.0
	1	**1021**	**1964**

Total Project Length

Total Project Length (as entered in "Project Information" form)	0.52

Average Construction Year

Weighted Year	1964

Total Segment Length (Miles)

Total Segment Length 0.52

Measure B: Geometric, Structural, or Infrastructure Improvements

Improved roadway to better accommodate freight movements: Yes

Response:

Hwy 10 is a Tier 1 corridor, TH 169 is a Tier 2 corridor, and Ferry Street is a Tier 3 corridor. The TH 169/TH 47/Ferry Street and TH 10 SPUI will improve the roadway geometry by providing wider turning movements which will accommodate trucks better than the existing diamond interchange. Increased capacity and additional storage at exit ramps will also accommodate freight traffic by decreasing the likelihood that freight traffic will stack back onto TH 10 thus providing a more reliable route.

(Limit 700 characters; approximately 100 words)

Improved clear zones or sight lines:

Response:

(Limit 700 characters; approximately 100 words)

Improved roadway geometrics: Yes

Response:

The project will add double left turns in each direction on TH 169/TH 47.

A right turn lane on northbound TH 169/TH 47 will be added to access eastbound TH 10.

A left-turn lane will be added to southbound TH 169/TH 47 for access to the realigned Maple Lane.

Exit ramp storage for westbound TH 10 will be expanded to accommodate double left and right turns which will add storage. Storage will also be added at the eastbound TH 10 ramp onto TH 169/TH 47.

Relocating Maple Lane will remove a local road access out of the interchange area.

(Limit 700 characters; approximately 100 words)

Access management enhancements:

Response:

The project will close access to existing Maple Lane and an existing apartment building. A new local road will be constructed, which will provide access to properties on Maple Lane including the apartment building. This new local road will have access to TH 169 and create a more appropriate access spacing. Accesses will be closed at 4-5 properties which will be acquired for the project, including a business and two residences in the northwest quadrant and a residence on the corner of Maple Lane. Grant St will be converted from full access to a RIRO.

(Limit 700 characters; approximately 100 words)

Vertical/horizontal alignment improvements:

Yes

Response:

The project will remedy the existing substandard clearance on the TH 169/TH 47 bridge by providing proper clearance (16? 4?).

(Limit 700 characters; approximately 100 words)

Improved stormwater mitigation:

Yes

Response:

The projects stormwater management efforts will address all potential threats to the Rum River, floodplains, wetlands, and local drainage ways. Open spaces between the ramps and highway will be used for stormwater management, if needed. Stormwater runoff will be conveyed from the roadway to the stormwater management system via curb and gutter and storm sewer.

Given the tight project limits, innovative stormwater management will be used to construct linear bioretention features to infiltrate stormwater, reduce pollutants and provide flood control. Native seeding will increase runoff volume retention, maximize nutrient uptake and help stormwater drain like it did before urbanization.

(Limit 700 characters; approximately 100 words)

Signals/lighting upgrades:

Yes

Response:

The conversion to a single point urban interchange will allow for more efficient timing as instead of two coordinated signals the interchange will operate under one signal. Additionally, spacing will be increased between the interchange and Pleasant Street to the north and Gray Street to the south which will allow for more queuing storage. The Pleasant Street signal timing will be coordinated with the interchange. There is existing lighting at the intersections and ramps which will also be recommended with the future project.

(Limit 700 characters; approximately 100 words)

Other Improvements

Yes

Response:

Sidewalks across Hwy 10 will travel along both sides of Ferry Street/TH 169. As one of four key north/south connections in the City this interchange is an important part of the City of Anoka?s sidewalk and trail system. Proposed improvements will provide an ADA-compliant sidewalk connection.

(Limit 700 characters; approximately 100 words)

Measure A: Congestion Reduction/Air Quality

Total Peak Hour Delay Per Vehicle Without The Project (Seconds/Vehicle)	Total Peak Hour Delay Per Vehicle With The Project (Seconds/Vehicle)	Total Peak Hour Delay Per Vehicle Reduced by Project (Seconds/Vehicle)	Volume (Vehicles per hour)	Total Peak Hour Delay Reduced by the Project:	EXPLANATION of methodology used to calculate railroad crossing delay, if applicable.	Synchro or HCM Reports
64.0	24.0	40.0	3523	140920.0	N/A	1531441209765_Part_5_Emissions_Attachment.pdf

Vehicle Delay Reduced

Total Peak Hour Delay Reduced

140920.0

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):
11.61	8.1	3.51
12	**8**	**4**

Total

Total Emissions Reduced:	3.51
Upload Synchro Report	1531493766687_Part_5_Emissions_Attachment.pdf

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

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

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

Total Parallel Roadway

Emissions Reduced on Parallel Roadways	0
Upload Synchro Report	1531493766687_Part_5_Emissions_Attachment.pdf

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

New Roadway Portion:

Cruise speed in miles per hour with the project:	0
Vehicle miles traveled with the project:	0
Total delay in hours with the project:	0
Total stops in vehicles per hour with the project:	0
Fuel consumption in gallons:	0
Total (CO, NOX, and VOC) Peak Hour Emissions Reduced or Produced on New Roadway (Kilograms):	0

EXPLANATION of methodology and assumptions used:(Limit 1,400 characters; approximately 200 words)	
Total (CO, NOX, and VOC) Peak Hour Emissions Reduced by the Project (Kilograms):	0.0

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

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

Measure A: Roadway Projects that do not Include Railroad Grade-Separation Elements

Crash Modification Factor Used:	Since there are no applicable crash modification factors for the proposed design, it was assumed that proposed single point urban interchange (SPUI) would operate similar to other SPUI?s in the state. Crashes at I-494 and Penn Avenue, I-494 and Lyndale Avenue, and TH 10 at Hanson Boulevard were analyzed. The average crash rate among the three analyzed was found to be 1.00. It was assumed that a SPUI at TH 10 and TH 47 would operate at this average crash rate. In order for the interchange to operate with a crash rate of 1.00, crashes would need to be decreased by 62%. Therefore, the percentage change in crashes shown in the HSIP worksheet was -59%.

(Limit 700 Characters; approximately 100 words)

Rationale for Crash Modification Selected: N/A.

(Limit 1400 Characters; approximately 200 words)

Project Benefit ($) from B/C Ratio $12,675,733.00

Worksheet Attachment 1531493526890_Part 6. Crash_&_HSIP_Data.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

Response:

Currently, there are sidewalks on both the east and west sides of Ferry Street with marked crosswalks at intersections/ramps. As one of four key north-south connections in the City of Anoka, TH 169/TH 47 links residential areas to employment and transit opportunities on opposite sides of TH 10, which creates a significant barrier in bicycle, pedestrian, and transit travel. Sidewalks along Ferry Street connect residential areas to Anoka-Hennepin School District offices, located just north of the project area, and Anoka Transit Station, located northeast of the project area.

A RBTN Tier 1 corridor encompasses the project area. This corridor follows Hwy 10 and parallels the Mississippi River to the south of Hwy 10. Non-motorized improvements made as part of this project would tie into establishment of a future RBTN Tier 1 corridor, separate from this project.

(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 (30 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

1531422755718_Layout_with_Letters_LAYOUT 200_SPUI3_SPUI-7-12-18.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

2)Review of Section 106 Historic Resources (20 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

100%

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

Yes

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 (30 Percent of Points)

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

100%

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

50%

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

25%

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

0%

Anticipated date or date of acquisition

4)Railroad Involvement (20 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

Measure A: Cost Effectiveness

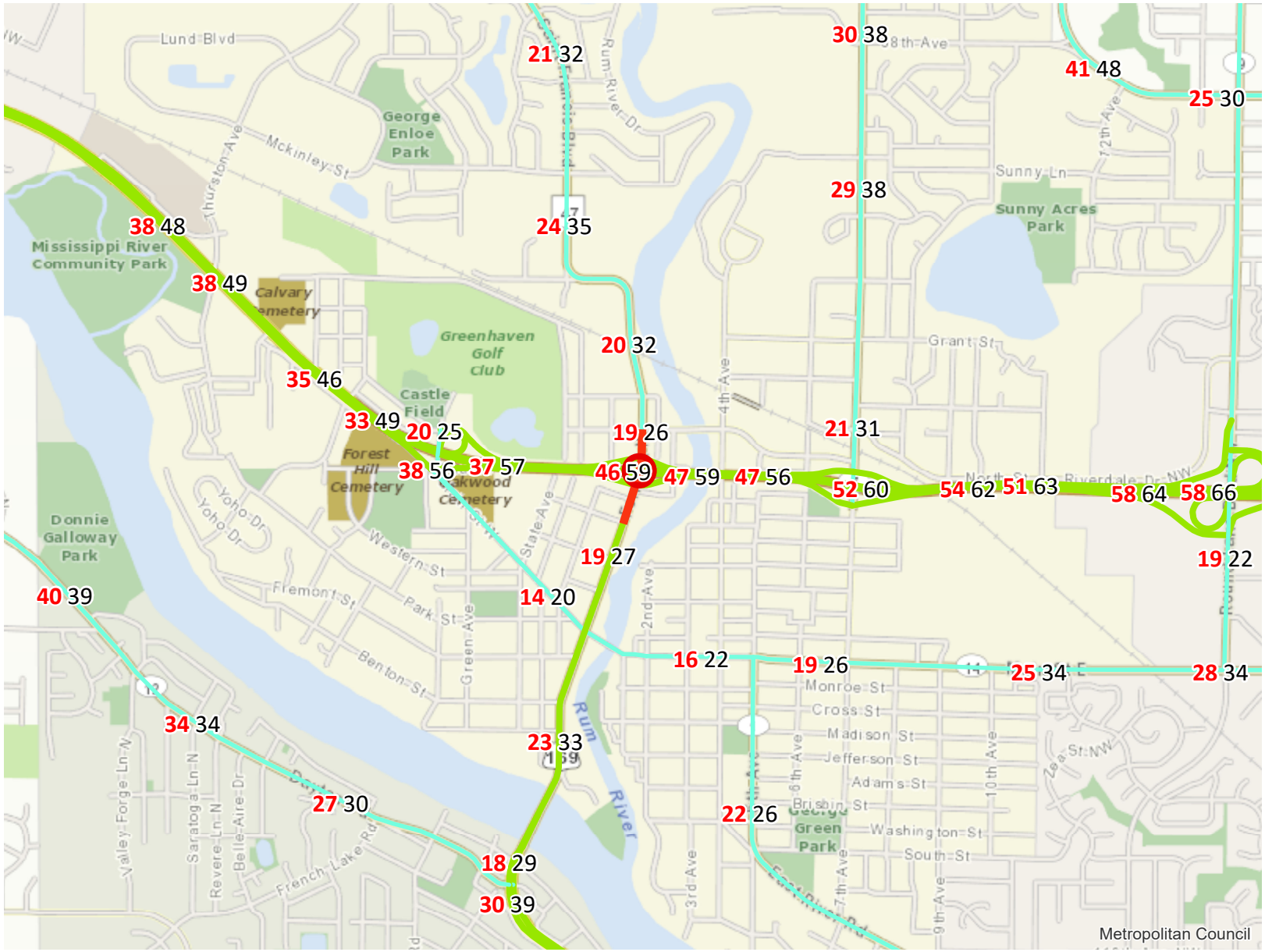
Total Project Cost (entered in Project Cost Form):	$27,130,969.00
Enter Amount of the Noise Walls:	$3,183,300.00
Total Project Cost subtract the amount of the noise walls:	$23,947,669.00
Points Awarded in Previous Criteria	
Cost Effectiveness	$0.00

Other Attachments

File Name	Description	File Size
116547_Current_Conditions_11x17L.pdf	Existing Conditions Map	5.2 MB
Combined_Letters_of_Support.pdf	Letters of Support from City of Anoka and Anoka County	482 KB
Met_Council_Generated_Maps_All.pdf	All Maps Generated from Metropolitan Council Mapping Tool	15.6 MB
Mike_Corbett_E-mail_RE_Interchange_Mod_Need.pdf	Correspondence regarding need for interchange modification request	63 KB
p16547_LAYOUT 200_SPUI3_SPUI-7-12-18.pdf	Project Concept Layout	812 KB
TH 169_47_10 Existing Conditions Photos.pdf	Existing Conditions Photos of Project Area	1.4 MB
TH169-MN47_&_TH_10_Interchange_One-Page-Description.pdf	One-page project summary	2.7 MB

Level of Congestion

Roadway Reconstruction/Modernization Project: TH 169/Ferry Street Interchange Seg 1 | Map ID: 1530880653881



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

0 0.25 0.5 1 1.5 2 Miles

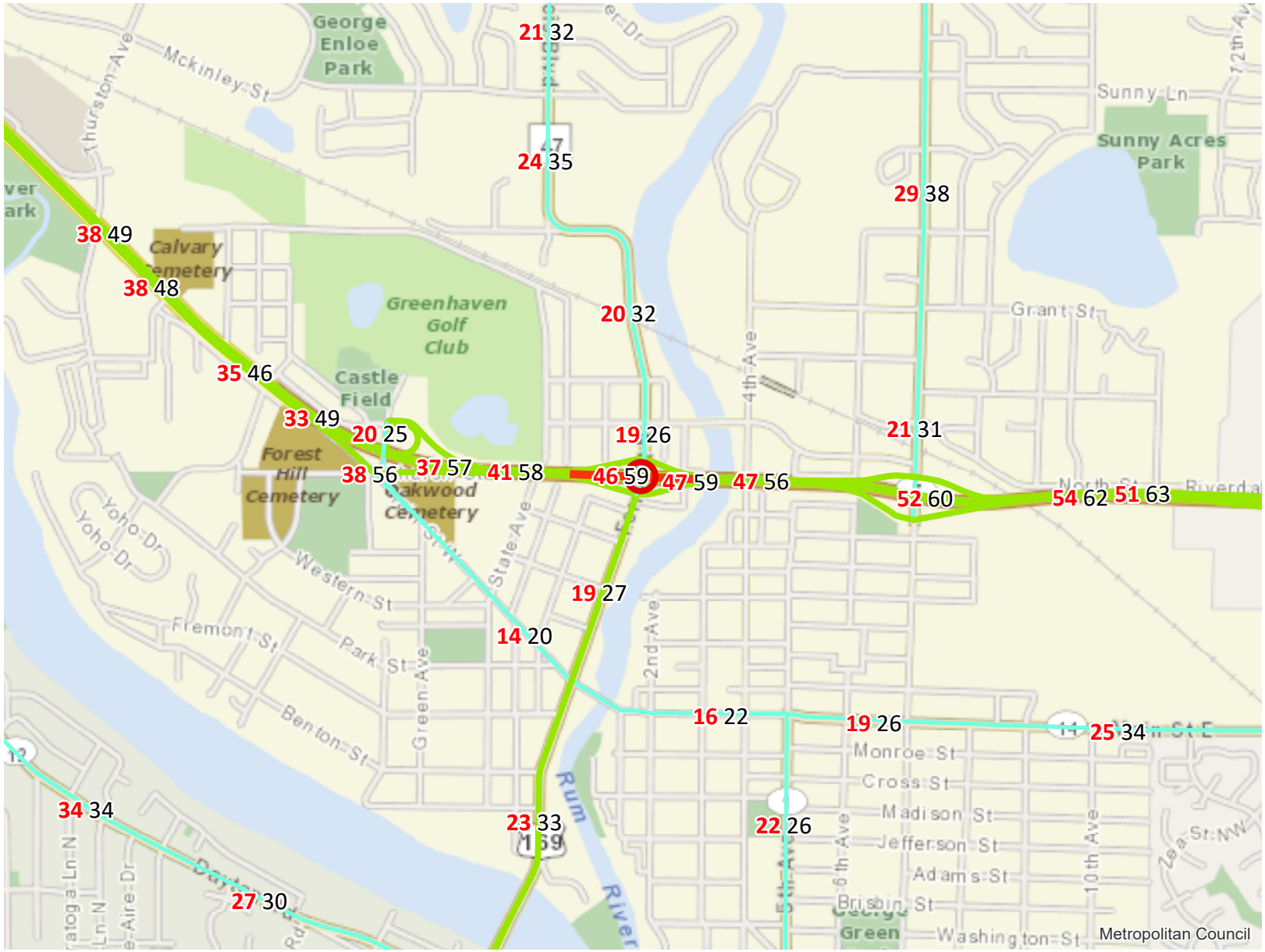
Created: 7/6/2018
LandscapeRSA1

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

METROPOLITAN COUNCIL

Level of Congestion

Roadway Reconstruction/Modernization Project: TH 169/Ferry Street Interchange | Map ID: 1531159155527



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

0 0.175 0.35 0.7 1.05 1.4 Miles

Created: 7/9/2018
LandscapeRSA1

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METROPOLITAN COUNCIL

Regional Economy

Roadway Reconstruction/Modernization Project: TH 169/Ferry Street Interchange Seg 1 | Map ID: 1530880653881

Results

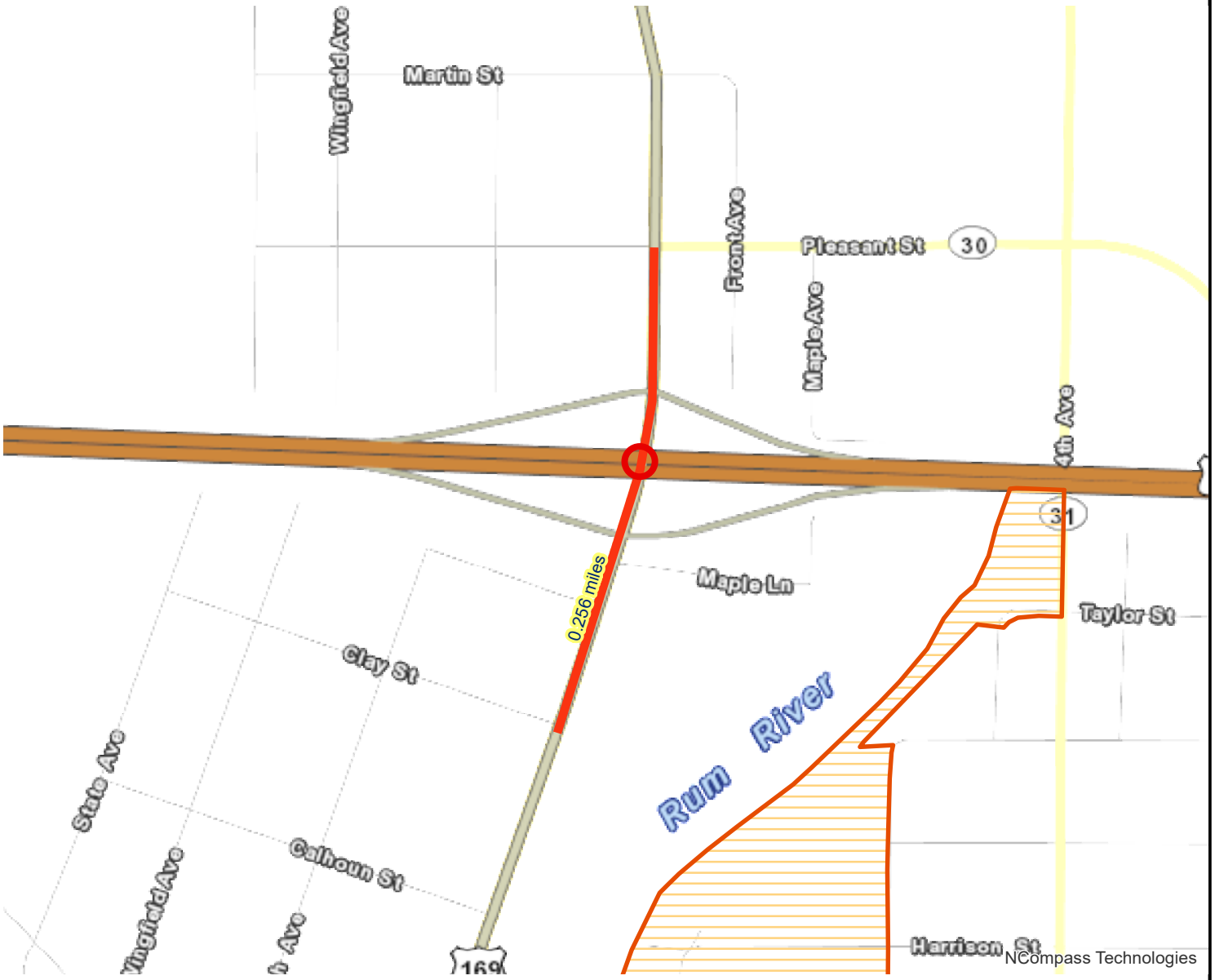
WITHIN ONE MI of project:
Postsecondary Students: 0

Totals by City:

Anoka
Population: 15433
Employment: 12393
Mfg and Dist Employment: 3665

Champlin
Population: 1889
Employment: 106
Mfg and Dist Employment: 1

Coon Rapids
Population: 4067
Employment: 318
Mfg and Dist Employment: 11



Project Points
Project
Manfacturing/Distribution Centers
Job Concentration Centers

0 0.05 0.1 0.2 0.3 0.4 Miles

Created: 7/6/2018
LandscapeRSA5

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METROPOLITAN COUNCIL

Regional Economy

Roadway Reconstruction/Modernization Project: TH 169/Ferry Street Interchange | Map ID: 1531159155527

Results

WITHIN ONE MI of project:
Postsecondary Students: 0

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Population: 15433
Employment: 12393
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Population: 1889
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Population: 4067
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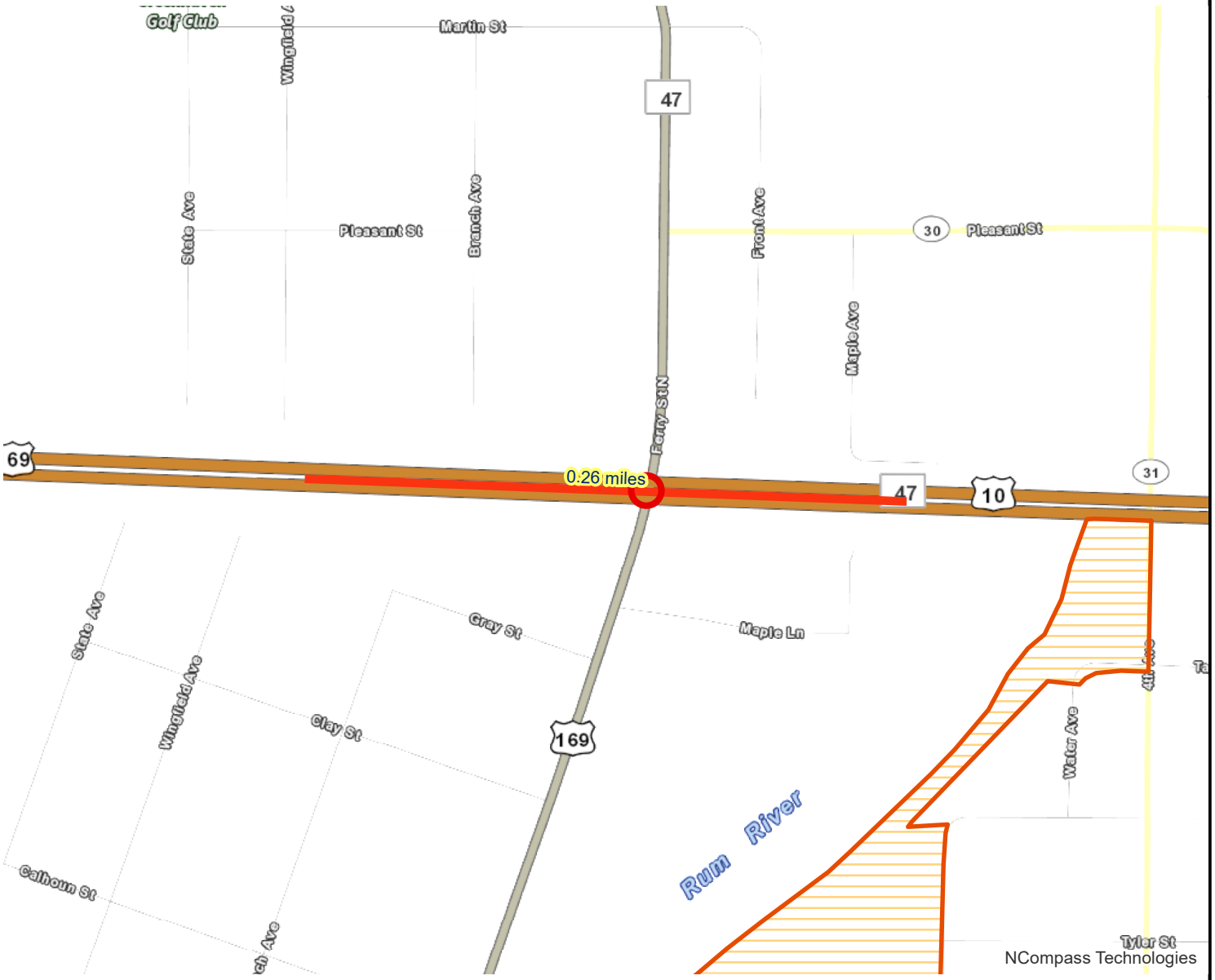


Project Points
Project
Manfacturing/Distribution Centers
Job Concentration Centers

0 0.0425 0.085 0.17 0.255 0.34 Miles

Created: 7/9/2018
LandscapeRSA5

METROPOLITAN COUNCIL

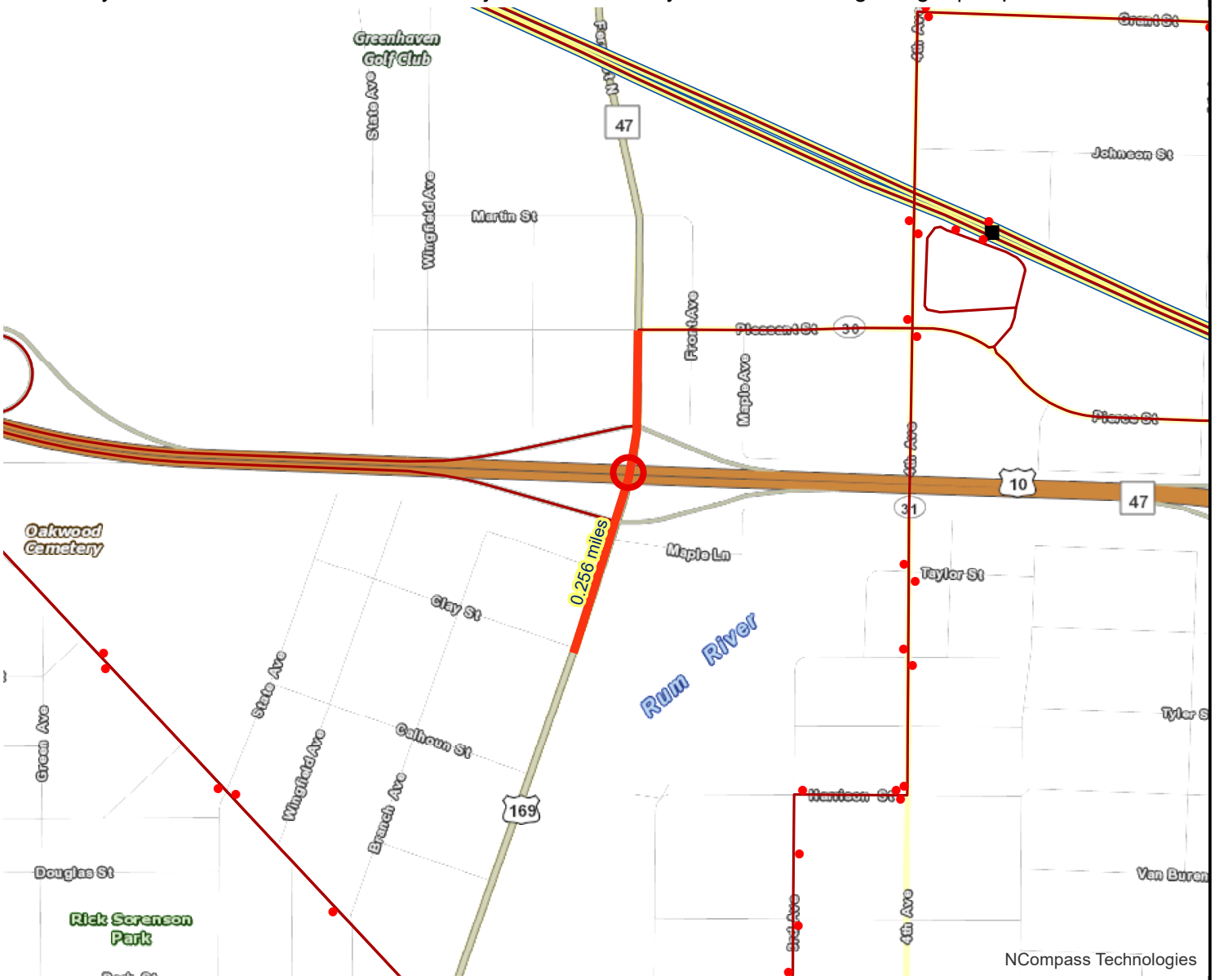
Transit Connections

Roadway Reconstruction/Modernization Project: TH 169/Ferry Street Interchange Seg 1 | Map ID: 1530880653881

Results

Transit with a Direct Connection to project: 887

**indicates Planned Alignments*



Project Points • Active Stop **Transitway Stations** — Transit Routes **Transitway**

Project ■ Northstar Line Northstar Line

0 0.075 0.15 0.3 0.45 0.6 Miles

Created: 7/6/2018
LandscapeRSA3

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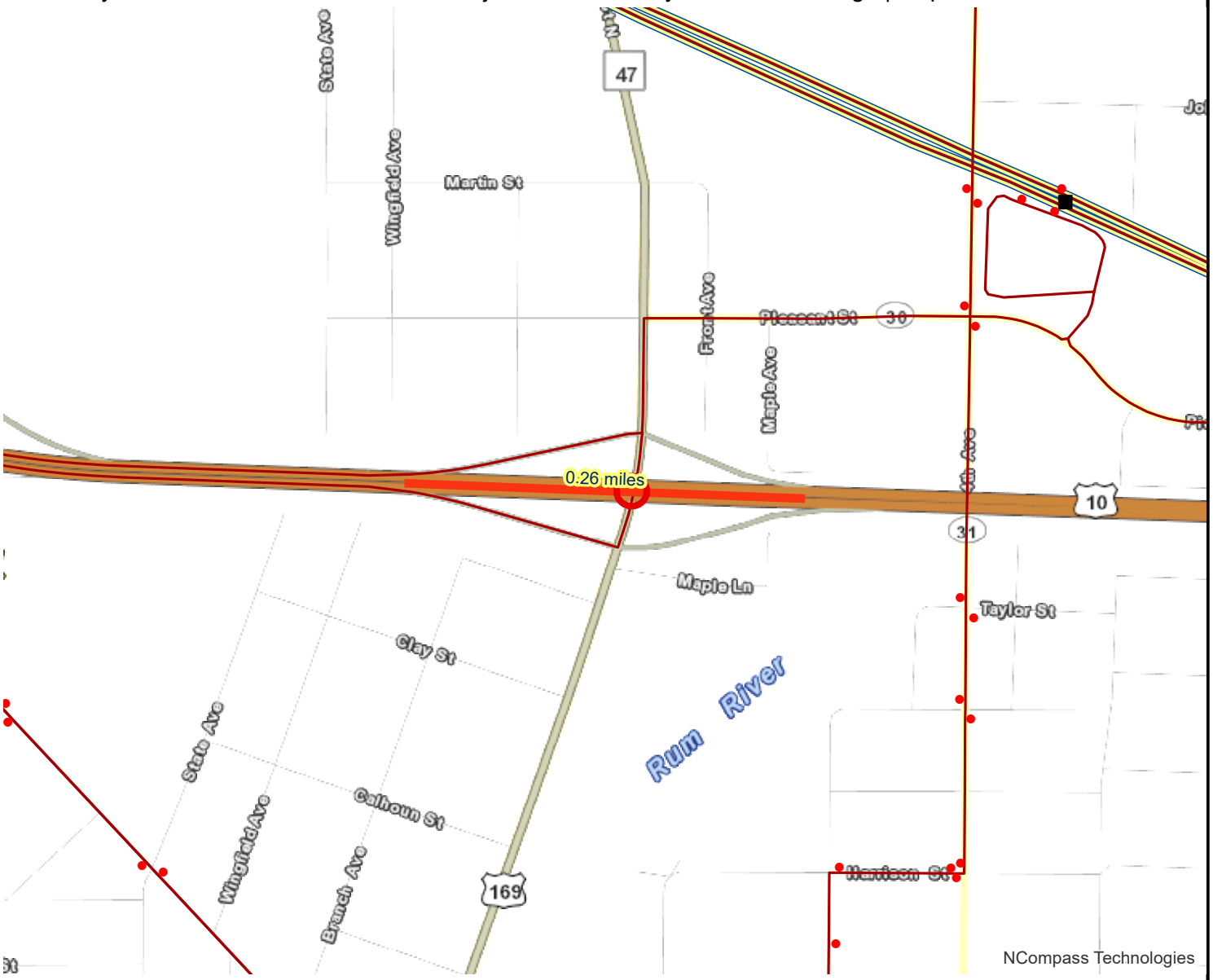
METROPOLITAN COUNCIL

Transit Connections

Roadway Reconstruction/Modernization Project: TH 169/Ferry Street Interchange | Map ID: 1531159155527



Results

Transit with a Direct Connection to project:
805 887

**indicates Planned Alignments*

Project Points
Active Stop
Transitway Stations
Transit Routes
Transitway
Project
Northstar Line
Northstar Line

0 0.05 0.1 0.2 0.3 0.4 Miles

Created: 7/9/2018
LandscapeRSA3

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

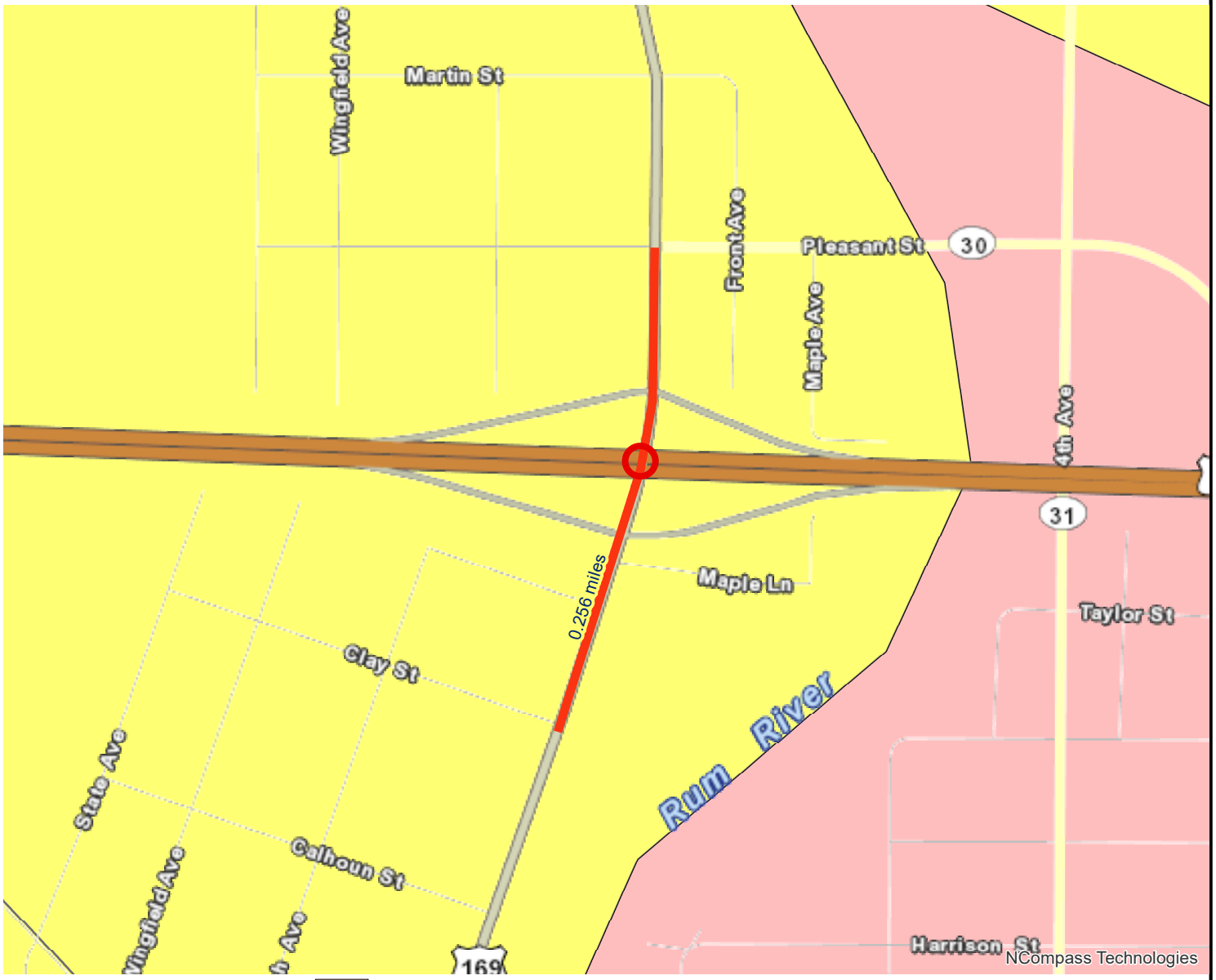
METROPOLITAN COUNCIL

Socio-Economic Conditions

Roadway Reconstruction/Modernization Project: TH 169/Ferry Street Interchange Seg 1 | Map ID: 1530880653881

Results

Project census tracts are above the regional average for population in poverty or population of color:
(0 to 18 Points)



Project Points
Project
Area of Concentrated Povertry > 50% residents of color
Area of Concentrated Poverty
Above reg'l avg conc of race/poverty

0 0.05 0.1 0.2 0.3 0.4 Miles

Created: 7/6/2018
LandscapeRSA2

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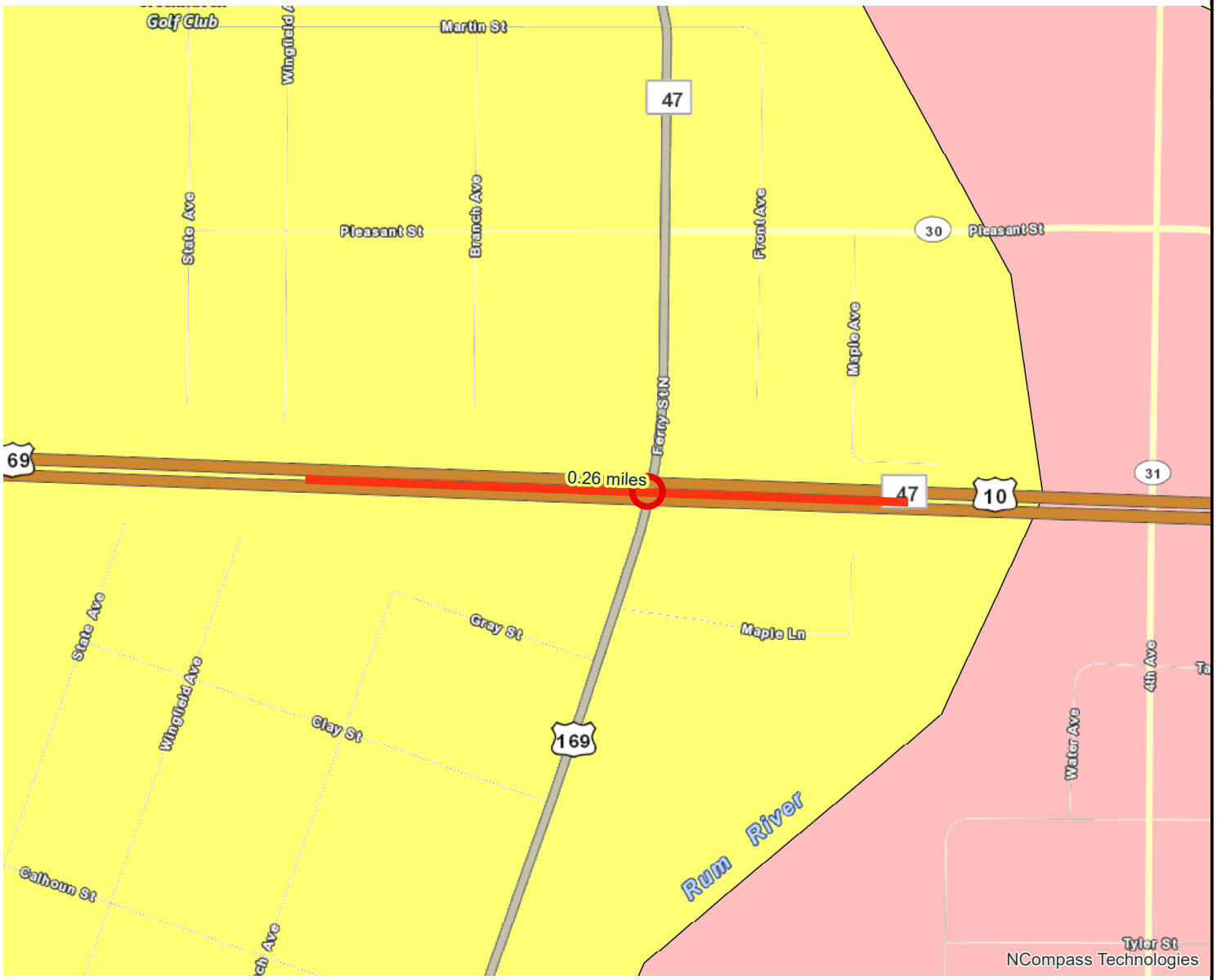
METROPOLITAN COUNCIL

Socio-Economic Conditions

Roadway Reconstruction/Modernization Project: TH 169/Ferry Street Interchange | Map ID: 1531159155527

Results

Project census tracts are above the regional average for population in poverty or population of color:
(0 to 18 Points)



Project Points

Project

Area of Concentrated Povertry > 50% residents of color

Area of Concentrated Poverty

Above reg'l avg conc of race/poverty

0 0.0425 0.085 0.17 0.255 0.34 Miles

Created: 7/9/2018
LandscapeRSA2

For complete disclaimer of accuracy, please visit
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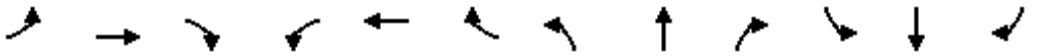
METROPOLITAN COUNCIL

Lanes, Volumes, Timings
3: TH 169/TH 47 & TH 10 S Ramp

07/10/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	1	65	1	0	2	0	815	737	344	986	0
Future Volume (vph)	69	1	65	1	0	2	0	815	737	344	986	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		300	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.987	0.850		0.910			0.929				
Flt Protected		0.957			0.984					0.950		
Satd. Flow (prot)	0	1671	1504	0	1668	0	0	3288	0	1770	1863	0
Flt Permitted		0.957								0.046		
Satd. Flow (perm)	0	1671	1504	0	1695	0	0	3288	0	86	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2	113		116			217				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		812			488			3240			384	
Travel Time (s)		18.5			11.1			73.6			8.7	
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)	75	1	71	1	0	2	0	886	801	374	1072	0
Shared Lane Traffic (%)			10%									
Lane Group Flow (vph)	0	83	64	0	3	0	0	1687	0	374	1072	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)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Number of Detectors	1	2	2	1	1			1		1	3	
Detector Template	Left		Right	Left	Thru			Thru		Left		
Leading Detector (ft)	20	126	126	20	25			126		78	156	
Trailing Detector (ft)	0	5	5	0	5			120		-5	-5	
Detector 1 Position(ft)	0	5	5	0	5			120		-5	-5	
Detector 1 Size(ft)	20	20	20	20	20			6		83	41	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
Detector 2 Position(ft)		120	120								72	
Detector 2 Size(ft)		6	6								6	
Detector 2 Type		Cl+Ex	Cl+Ex								Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0	0.0								0.0	
Detector 3 Position(ft)											150	
Detector 3 Size(ft)											6	
Detector 3 Type											Cl+Ex	
Detector 3 Channel												

Existing

Lanes, Volumes, Timings
3: TH 169/TH 47 & TH 10 S Ramp

07/10/2018

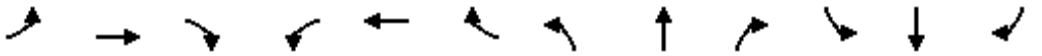
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 3 Extend (s)											0.0	
Turn Type	Split	NA	Perm	Perm	NA			NA		pm+pt	NA	
Protected Phases	4	4			3			2		1	6	
Permitted Phases			4	3						6		
Detector Phase	4	4	4	3	3			2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0			5.0		5.0	5.0	
Minimum Split (s)	11.0	11.0	11.0	23.5	23.5			26.5		10.0	26.5	
Total Split (s)	14.0	14.0	14.0	23.5	23.5			81.5		31.0	112.5	
Total Split (%)	9.3%	9.3%	9.3%	15.7%	15.7%			54.3%		20.7%	75.0%	
Maximum Green (s)	8.0	8.0	8.0	18.0	18.0			75.0		26.0	106.0	
Yellow Time (s)	4.0	4.0	4.0	3.5	3.5			3.5		3.0	3.5	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0			3.0		2.0	3.0	
Lost Time Adjust (s)		0.0	0.0		0.0			0.0		0.0	0.0	
Total Lost Time (s)		6.0	6.0		5.5			6.5		5.0	6.5	
Lead/Lag	Lag	Lag	Lag	Lead	Lead			Lead		Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0		3.0	3.0	
Recall Mode	None	None	None	None	None			C-Min		None	C-Min	
Walk Time (s)				7.0	7.0			7.0			7.0	
Flash Dont Walk (s)				11.0	11.0			13.0			13.0	
Pedestrian Calls (#/hr)				0	0			0			0	
Act Effct Green (s)		14.1	14.1		5.4			84.1		122.7	121.2	
Actuated g/C Ratio		0.09	0.09		0.04			0.56		0.82	0.81	
v/c Ratio		0.53	0.26		0.02			0.87		0.87	0.71	
Control Delay		74.7	2.8		0.3			30.4		81.0	19.6	
Queue Delay		0.0	0.0		0.0			0.7		57.2	0.0	
Total Delay		74.7	2.8		0.3			31.1		138.2	19.6	
LOS		E	A		A			C		F	B	
Approach Delay		43.4			0.3			31.1			50.3	
Approach LOS		D			A			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of 1st Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 40.1		Intersection LOS: D	
Intersection Capacity Utilization 90.4%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 3: TH 169/TH 47 & TH 10 S Ramp

Lanes, Volumes, Timings
6: TH 47 & TH 10 N Ramp

07/10/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	507	7	336	139	747	0	0	823	104
Future Volume (vph)	0	0	0	507	7	336	139	747	0	0	823	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	350		350	0		0	0		0
Storage Lanes	0		0	1		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	0.95	0.95	0.95	1.00	1.00	0.95	0.95
Frt					0.963	0.850					0.983	
Flt Protected				0.950	0.965			0.992				
Satd. Flow (prot)	0	0	0	1681	1575	1504	0	3511	0	0	3479	0
Flt Permitted				0.950	0.965			0.587				
Satd. Flow (perm)	0	0	0	1681	1575	1504	0	2078	0	0	3479	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					11	214					15	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		300			659			384			908	
Travel Time (s)		6.8			15.0			8.7			20.6	
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)	0	0	0	551	8	365	151	812	0	0	895	113
Shared Lane Traffic (%)				42%		21%						
Lane Group Flow (vph)	0	0	0	320	316	288	0	963	0	0	1008	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
Number of Detectors				2	2	2	1	2			2	
Detector Template							Left					
Leading Detector (ft)				126	126	126	20	126			126	
Trailing Detector (ft)				5	5	5	0	-5			5	
Detector 1 Position(ft)				5	5	5	0	-5			5	
Detector 1 Size(ft)				20	20	20	20	46			20	
Detector 1 Type				Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0	0.0	0.0	0.0			0.0	
Detector 1 Queue (s)				0.0	0.0	0.0	0.0	0.0			0.0	
Detector 1 Delay (s)				0.0	0.0	0.0	0.0	0.0			0.0	
Detector 2 Position(ft)				120	120	120		120			120	
Detector 2 Size(ft)				6	6	6		6			6	
Detector 2 Type				Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)				0.0	0.0	0.0		0.0			0.0	
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					
Detector Phase				8	8	8	5	2			6	

Existing

Lanes, Volumes, Timings
6: TH 47 & TH 10 N Ramp

07/10/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)				5.0	5.0	5.0	5.0	5.0			5.0	
Minimum Split (s)				22.5	22.5	22.5	9.5	24.5			22.5	
Total Split (s)				49.0	49.0	49.0	9.5	101.0			91.5	
Total Split (%)				32.7%	32.7%	32.7%	6.3%	67.3%			61.0%	
Maximum Green (s)				44.5	44.5	44.5	5.0	96.5			87.0	
Yellow Time (s)				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	
Lost Time Adjust (s)				0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)				4.5	4.5	4.5		4.5			4.5	
Lead/Lag							Lag				Lead	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	
Recall Mode				None	None	None	None	C-Max			C-Max	
Walk Time (s)				7.0	7.0	7.0		7.0			7.0	
Flash Dont Walk (s)				11.0	11.0	11.0		13.0			11.0	
Pedestrian Calls (#/hr)				0	0	0		0			0	
Act Effct Green (s)				36.9	36.9	36.9		104.1			104.1	
Actuated g/C Ratio				0.25	0.25	0.25		0.69			0.69	
v/c Ratio				0.77	0.80	0.54		0.67			0.42	
Control Delay				65.0	65.9	16.0		7.1			11.1	
Queue Delay				6.5	8.4	0.0		1.8			0.1	
Total Delay				71.5	74.3	16.0		8.8			11.2	
LOS				E	E	B		A			B	
Approach Delay					55.2			8.8			11.2	
Approach LOS					E			A			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of 1st Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 24.4		Intersection LOS: C	
Intersection Capacity Utilization 79.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 6: TH 47 & TH 10 N Ramp

Measures of Effectiveness

3: TH 169/TH 47 & TH 10 S Ramp

Direction	All
Future Volume (vph)	3020
Total Delay / Veh (s/v)	40
CO Emissions (kg)	5.71
NOx Emissions (kg)	1.11
VOC Emissions (kg)	1.32

6: TH 47 & TH 10 N Ramp

Direction	All
Future Volume (vph)	2663
Total Delay / Veh (s/v)	24
CO Emissions (kg)	2.44
NOx Emissions (kg)	0.47
VOC Emissions (kg)	0.56

Build

Lanes, Volumes, Timings
9: TH 169/TH 47 & TH 10 EB Ramp/TH 10 WB Ramp

07/09/2018

Lane Group	EBL	EBR2	WBL	WBR2	NBL	NBT	NBR2	SBL	SBT	SBR2
Lane Configurations										
Traffic Volume (vph)	69	65	507	336	139	743	737	344	479	104
Future Volume (vph)	69	65	507	336	139	743	737	344	479	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0		300			300		
Storage Lanes	1		2		2			2		
Taper Length (ft)	25		25		50			50		
Lane Util. Factor	1.00	1.00	0.97	0.88	0.97	0.95	1.00	0.97	0.95	0.95
Frt		0.850		0.850			0.850		0.973	
Flt Protected	0.950		0.950		0.950			0.950		
Satd. Flow (prot)	1770	1583	3433	2787	3433	3539	1583	3433	3444	0
Flt Permitted	0.950		0.950		0.950			0.950		
Satd. Flow (perm)	1770	1583	3433	2787	3433	3539	1583	3433	3444	0
Right Turn on Red		Yes		Yes			Yes			Yes
Satd. Flow (RTOR)		236		365			765		236	
Link Speed (mph)						30			30	
Link Distance (ft)						3248			929	
Travel Time (s)						73.8			21.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	75	71	551	365	151	808	801	374	521	113
Shared Lane Traffic (%)										
Lane Group Flow (vph)	75	71	551	365	151	808	801	374	634	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)						24			24	
Link Offset(ft)						0			0	
Crosswalk Width(ft)						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
Turning Speed (mph)	25	15	25	15	25		15	25		15
Number of Detectors	1	1	1	1	1	1	1	1	1	
Detector Template		Right								
Leading Detector (ft)	50	20	50	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	50	20	50	50	50	50	50	50	50	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
Turn Type	Prot	Prot	Prot	Prot	Prot	NA	Perm	Prot	NA	
Protected Phases	4	5	8	1	5	2		1	6	
Permitted Phases							2			
Detector Phase	4	5	8	1	5	2	2	1	6	
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	22.0	12.0	22.0	12.0	12.0	24.0	24.0	12.0	24.0	
Total Split (s)	22.0	14.0	22.0	14.0	14.0	24.0	24.0	14.0	24.0	

Lanes, Volumes, Timings
9: TH 169/TH 47 & TH 10 EB Ramp/TH 10 WB Ramp

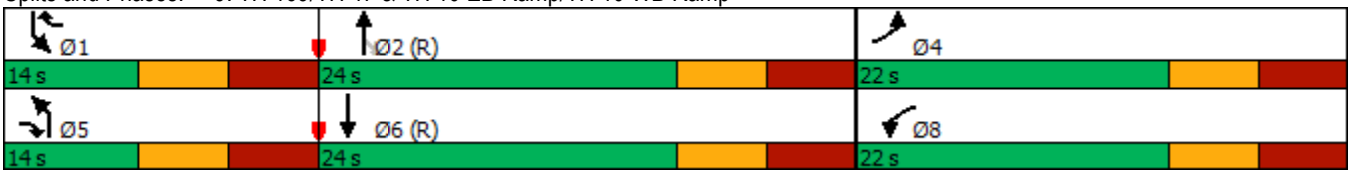
07/09/2018

Lane Group	EBL	EBR2	WBL	WBR2	NBL	NBT	NBR2	SBL	SBT	SBR2
Total Split (%)	36.7%	23.3%	36.7%	23.3%	23.3%	40.0%	40.0%	23.3%	40.0%	
Maximum Green (s)	14.0	6.0	14.0	6.0	6.0	16.0	16.0	6.0	16.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	
Lead/Lag		Lead		Lead	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?		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	
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max	
Walk Time (s)						5.0	5.0		5.0	
Flash Dont Walk (s)						11.0	11.0		11.0	
Pedestrian Calls (#/hr)						0	0		0	
Act Effct Green (s)	13.2	6.2	13.2	6.8	6.2	16.0	16.0	6.8	19.4	
Actuated g/C Ratio	0.22	0.10	0.22	0.11	0.10	0.27	0.27	0.11	0.32	
v/c Ratio	0.19	0.19	0.73	0.57	0.43	0.86	0.81	0.96	0.50	
Control Delay	20.1	1.1	28.1	7.5	29.4	32.3	11.0	68.5	12.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	20.1	1.1	28.1	7.5	29.4	32.3	11.0	68.5	12.8	
LOS	C	A	C	A	C	C	B	E	B	
Approach Delay						22.3			33.5	
Approach LOS						C			C	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 24.2 Intersection LOS: C
Intersection Capacity Utilization Err% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 9: TH 169/TH 47 & TH 10 EB Ramp/TH 10 WB Ramp



Measures of Effectiveness

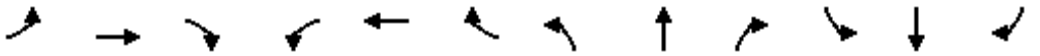
07/09/2018

9: TH 169/TH 47 & TH 10 EB Ramp/TH 10 WB Ramp

Direction	All
Future Volume (vph)	3523
Total Delay / Veh (s/v)	24
CO Emissions (kg)	5.68
NOx Emissions (kg)	1.10
VOC Emissions (kg)	1.32

Lanes, Volumes, Timings
3: TH 169/TH 47 & TH 10 S Ramp

07/10/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	1	65	1	0	2	0	815	737	344	986	0
Future Volume (vph)	69	1	65	1	0	2	0	815	737	344	986	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		300	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.987	0.850		0.910			0.929				
Flt Protected		0.957			0.984					0.950		
Satd. Flow (prot)	0	1671	1504	0	1668	0	0	3288	0	1770	1863	0
Flt Permitted		0.957								0.046		
Satd. Flow (perm)	0	1671	1504	0	1695	0	0	3288	0	86	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2	113		116			217				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		812			488			3240			384	
Travel Time (s)		18.5			11.1			73.6			8.7	
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)	75	1	71	1	0	2	0	886	801	374	1072	0
Shared Lane Traffic (%)			10%									
Lane Group Flow (vph)	0	83	64	0	3	0	0	1687	0	374	1072	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)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Number of Detectors	1	2	2	1	1			1		1	3	
Detector Template	Left		Right	Left	Thru			Thru		Left		
Leading Detector (ft)	20	126	126	20	25			126		78	156	
Trailing Detector (ft)	0	5	5	0	5			120		-5	-5	
Detector 1 Position(ft)	0	5	5	0	5			120		-5	-5	
Detector 1 Size(ft)	20	20	20	20	20			6		83	41	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
Detector 2 Position(ft)		120	120								72	
Detector 2 Size(ft)		6	6								6	
Detector 2 Type		Cl+Ex	Cl+Ex								Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0	0.0								0.0	
Detector 3 Position(ft)											150	
Detector 3 Size(ft)											6	
Detector 3 Type											Cl+Ex	
Detector 3 Channel												

Existing

Lanes, Volumes, Timings
3: TH 169/TH 47 & TH 10 S Ramp

07/10/2018

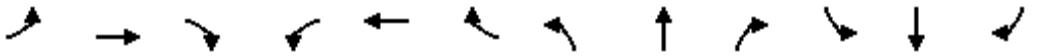
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 3 Extend (s)											0.0	
Turn Type	Split	NA	Perm	Perm	NA			NA		pm+pt	NA	
Protected Phases	4	4			3			2		1	6	
Permitted Phases			4	3						6		
Detector Phase	4	4	4	3	3			2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0			5.0		5.0	5.0	
Minimum Split (s)	11.0	11.0	11.0	23.5	23.5			26.5		10.0	26.5	
Total Split (s)	14.0	14.0	14.0	23.5	23.5			81.5		31.0	112.5	
Total Split (%)	9.3%	9.3%	9.3%	15.7%	15.7%			54.3%		20.7%	75.0%	
Maximum Green (s)	8.0	8.0	8.0	18.0	18.0			75.0		26.0	106.0	
Yellow Time (s)	4.0	4.0	4.0	3.5	3.5			3.5		3.0	3.5	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0			3.0		2.0	3.0	
Lost Time Adjust (s)		0.0	0.0		0.0			0.0		0.0	0.0	
Total Lost Time (s)		6.0	6.0		5.5			6.5		5.0	6.5	
Lead/Lag	Lag	Lag	Lag	Lead	Lead			Lead		Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0		3.0	3.0	
Recall Mode	None	None	None	None	None			C-Min		None	C-Min	
Walk Time (s)				7.0	7.0			7.0			7.0	
Flash Dont Walk (s)				11.0	11.0			13.0			13.0	
Pedestrian Calls (#/hr)				0	0			0			0	
Act Effct Green (s)		14.1	14.1		5.4			84.1		122.7	121.2	
Actuated g/C Ratio		0.09	0.09		0.04			0.56		0.82	0.81	
v/c Ratio		0.53	0.26		0.02			0.87		0.87	0.71	
Control Delay		74.7	2.8		0.3			30.4		81.0	19.6	
Queue Delay		0.0	0.0		0.0			0.7		57.2	0.0	
Total Delay		74.7	2.8		0.3			31.1		138.2	19.6	
LOS		E	A		A			C		F	B	
Approach Delay		43.4			0.3			31.1			50.3	
Approach LOS		D			A			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of 1st Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 40.1		Intersection LOS: D	
Intersection Capacity Utilization 90.4%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 3: TH 169/TH 47 & TH 10 S Ramp

Lanes, Volumes, Timings
6: TH 47 & TH 10 N Ramp

07/10/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	507	7	336	139	747	0	0	823	104
Future Volume (vph)	0	0	0	507	7	336	139	747	0	0	823	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	350		350	0		0	0		0
Storage Lanes	0		0	1		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	0.95	0.95	0.95	1.00	1.00	0.95	0.95
Frt					0.963	0.850					0.983	
Flt Protected				0.950	0.965			0.992				
Satd. Flow (prot)	0	0	0	1681	1575	1504	0	3511	0	0	3479	0
Flt Permitted				0.950	0.965			0.587				
Satd. Flow (perm)	0	0	0	1681	1575	1504	0	2078	0	0	3479	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					11	214					15	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		300			659			384			908	
Travel Time (s)		6.8			15.0			8.7			20.6	
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)	0	0	0	551	8	365	151	812	0	0	895	113
Shared Lane Traffic (%)				42%		21%						
Lane Group Flow (vph)	0	0	0	320	316	288	0	963	0	0	1008	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
Number of Detectors				2	2	2	1	2			2	
Detector Template							Left					
Leading Detector (ft)				126	126	126	20	126			126	
Trailing Detector (ft)				5	5	5	0	-5			5	
Detector 1 Position(ft)				5	5	5	0	-5			5	
Detector 1 Size(ft)				20	20	20	20	46			20	
Detector 1 Type				Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0	0.0	0.0	0.0			0.0	
Detector 1 Queue (s)				0.0	0.0	0.0	0.0	0.0			0.0	
Detector 1 Delay (s)				0.0	0.0	0.0	0.0	0.0			0.0	
Detector 2 Position(ft)				120	120	120		120			120	
Detector 2 Size(ft)				6	6	6		6			6	
Detector 2 Type				Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)				0.0	0.0	0.0		0.0			0.0	
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					
Detector Phase				8	8	8	5	2			6	

Existing

Lanes, Volumes, Timings
6: TH 47 & TH 10 N Ramp

07/10/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)				5.0	5.0	5.0	5.0	5.0			5.0	
Minimum Split (s)				22.5	22.5	22.5	9.5	24.5			22.5	
Total Split (s)				49.0	49.0	49.0	9.5	101.0			91.5	
Total Split (%)				32.7%	32.7%	32.7%	6.3%	67.3%			61.0%	
Maximum Green (s)				44.5	44.5	44.5	5.0	96.5			87.0	
Yellow Time (s)				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	
Lost Time Adjust (s)				0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)				4.5	4.5	4.5		4.5			4.5	
Lead/Lag							Lag				Lead	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	
Recall Mode				None	None	None	None	C-Max			C-Max	
Walk Time (s)				7.0	7.0	7.0		7.0			7.0	
Flash Dont Walk (s)				11.0	11.0	11.0		13.0			11.0	
Pedestrian Calls (#/hr)				0	0	0		0			0	
Act Effct Green (s)				36.9	36.9	36.9		104.1			104.1	
Actuated g/C Ratio				0.25	0.25	0.25		0.69			0.69	
v/c Ratio				0.77	0.80	0.54		0.67			0.42	
Control Delay				65.0	65.9	16.0		7.1			11.1	
Queue Delay				6.5	8.4	0.0		1.8			0.1	
Total Delay				71.5	74.3	16.0		8.8			11.2	
LOS				E	E	B		A			B	
Approach Delay					55.2			8.8			11.2	
Approach LOS					E			A			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of 1st Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 24.4		Intersection LOS: C	
Intersection Capacity Utilization 79.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 6: TH 47 & TH 10 N Ramp

Measures of Effectiveness

3: TH 169/TH 47 & TH 10 S Ramp

Direction	All
Future Volume (vph)	3020
Total Delay / Veh (s/v)	40
CO Emissions (kg)	5.71
NOx Emissions (kg)	1.11
VOC Emissions (kg)	1.32

6: TH 47 & TH 10 N Ramp

Direction	All
Future Volume (vph)	2663
Total Delay / Veh (s/v)	24
CO Emissions (kg)	2.44
NOx Emissions (kg)	0.47
VOC Emissions (kg)	0.56

Build

Lanes, Volumes, Timings
9: TH 169/TH 47 & TH 10 EB Ramp/TH 10 WB Ramp

07/09/2018

Lane Group	EBL	EBR2	WBL	WBR2	NBL	NBT	NBR2	SBL	SBT	SBR2
Lane Configurations										
Traffic Volume (vph)	69	65	507	336	139	743	737	344	479	104
Future Volume (vph)	69	65	507	336	139	743	737	344	479	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0		300			300		
Storage Lanes	1		2		2			2		
Taper Length (ft)	25		25		50			50		
Lane Util. Factor	1.00	1.00	0.97	0.88	0.97	0.95	1.00	0.97	0.95	0.95
Frt		0.850		0.850			0.850		0.973	
Flt Protected	0.950		0.950		0.950			0.950		
Satd. Flow (prot)	1770	1583	3433	2787	3433	3539	1583	3433	3444	0
Flt Permitted	0.950		0.950		0.950			0.950		
Satd. Flow (perm)	1770	1583	3433	2787	3433	3539	1583	3433	3444	0
Right Turn on Red		Yes		Yes			Yes			Yes
Satd. Flow (RTOR)		236		365			765		236	
Link Speed (mph)						30			30	
Link Distance (ft)						3248			929	
Travel Time (s)						73.8			21.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	75	71	551	365	151	808	801	374	521	113
Shared Lane Traffic (%)										
Lane Group Flow (vph)	75	71	551	365	151	808	801	374	634	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)						24			24	
Link Offset(ft)						0			0	
Crosswalk Width(ft)						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
Turning Speed (mph)	25	15	25	15	25		15	25		15
Number of Detectors	1	1	1	1	1	1	1	1	1	
Detector Template		Right								
Leading Detector (ft)	50	20	50	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	50	20	50	50	50	50	50	50	50	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
Turn Type	Prot	Prot	Prot	Prot	Prot	NA	Perm	Prot	NA	
Protected Phases	4	5	8	1	5	2		1	6	
Permitted Phases							2			
Detector Phase	4	5	8	1	5	2	2	1	6	
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	22.0	12.0	22.0	12.0	12.0	24.0	24.0	12.0	24.0	
Total Split (s)	22.0	14.0	22.0	14.0	14.0	24.0	24.0	14.0	24.0	

Lanes, Volumes, Timings
9: TH 169/TH 47 & TH 10 EB Ramp/TH 10 WB Ramp

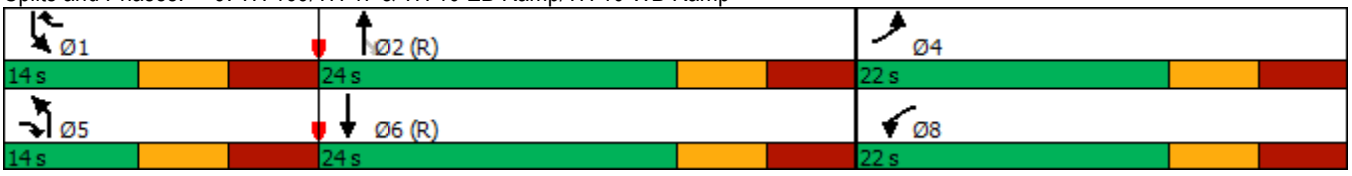
07/09/2018

Lane Group	EBL	EBR2	WBL	WBR2	NBL	NBT	NBR2	SBL	SBT	SBR2
Total Split (%)	36.7%	23.3%	36.7%	23.3%	23.3%	40.0%	40.0%	23.3%	40.0%	
Maximum Green (s)	14.0	6.0	14.0	6.0	6.0	16.0	16.0	6.0	16.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	
Lead/Lag		Lead		Lead	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?		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	
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max	
Walk Time (s)						5.0	5.0		5.0	
Flash Dont Walk (s)						11.0	11.0		11.0	
Pedestrian Calls (#/hr)						0	0		0	
Act Effct Green (s)	13.2	6.2	13.2	6.8	6.2	16.0	16.0	6.8	19.4	
Actuated g/C Ratio	0.22	0.10	0.22	0.11	0.10	0.27	0.27	0.11	0.32	
v/c Ratio	0.19	0.19	0.73	0.57	0.43	0.86	0.81	0.96	0.50	
Control Delay	20.1	1.1	28.1	7.5	29.4	32.3	11.0	68.5	12.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	20.1	1.1	28.1	7.5	29.4	32.3	11.0	68.5	12.8	
LOS	C	A	C	A	C	C	B	E	B	
Approach Delay						22.3			33.5	
Approach LOS						C			C	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 24.2 Intersection LOS: C
Intersection Capacity Utilization Err% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 9: TH 169/TH 47 & TH 10 EB Ramp/TH 10 WB Ramp



Measures of Effectiveness

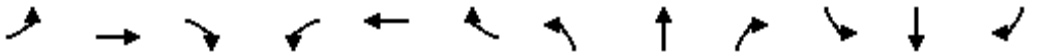
07/09/2018

9: TH 169/TH 47 & TH 10 EB Ramp/TH 10 WB Ramp

Direction	All
Future Volume (vph)	3523
Total Delay / Veh (s/v)	24
CO Emissions (kg)	5.68
NOx Emissions (kg)	1.10
VOC Emissions (kg)	1.32

Lanes, Volumes, Timings
3: TH 169/TH 47 & TH 10 S Ramp

07/10/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	1	65	1	0	2	0	815	737	344	986	0
Future Volume (vph)	69	1	65	1	0	2	0	815	737	344	986	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		300	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.987	0.850		0.910			0.929				
Flt Protected		0.957			0.984					0.950		
Satd. Flow (prot)	0	1671	1504	0	1668	0	0	3288	0	1770	1863	0
Flt Permitted		0.957								0.046		
Satd. Flow (perm)	0	1671	1504	0	1695	0	0	3288	0	86	1863	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2	113		116			217				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		812			488			3240			384	
Travel Time (s)		18.5			11.1			73.6			8.7	
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)	75	1	71	1	0	2	0	886	801	374	1072	0
Shared Lane Traffic (%)			10%									
Lane Group Flow (vph)	0	83	64	0	3	0	0	1687	0	374	1072	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)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Number of Detectors	1	2	2	1	1			1		1	3	
Detector Template	Left		Right	Left	Thru			Thru		Left		
Leading Detector (ft)	20	126	126	20	25			126		78	156	
Trailing Detector (ft)	0	5	5	0	5			120		-5	-5	
Detector 1 Position(ft)	0	5	5	0	5			120		-5	-5	
Detector 1 Size(ft)	20	20	20	20	20			6		83	41	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
Detector 2 Position(ft)		120	120								72	
Detector 2 Size(ft)		6	6								6	
Detector 2 Type		Cl+Ex	Cl+Ex								Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0	0.0								0.0	
Detector 3 Position(ft)											150	
Detector 3 Size(ft)											6	
Detector 3 Type											Cl+Ex	
Detector 3 Channel												

Existing

Lanes, Volumes, Timings
3: TH 169/TH 47 & TH 10 S Ramp

07/10/2018

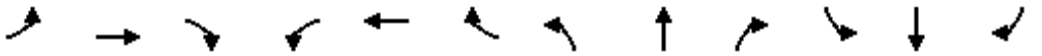
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 3 Extend (s)											0.0	
Turn Type	Split	NA	Perm	Perm	NA			NA		pm+pt	NA	
Protected Phases	4	4			3			2		1	6	
Permitted Phases			4	3						6		
Detector Phase	4	4	4	3	3			2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0			5.0		5.0	5.0	
Minimum Split (s)	11.0	11.0	11.0	23.5	23.5			26.5		10.0	26.5	
Total Split (s)	14.0	14.0	14.0	23.5	23.5			81.5		31.0	112.5	
Total Split (%)	9.3%	9.3%	9.3%	15.7%	15.7%			54.3%		20.7%	75.0%	
Maximum Green (s)	8.0	8.0	8.0	18.0	18.0			75.0		26.0	106.0	
Yellow Time (s)	4.0	4.0	4.0	3.5	3.5			3.5		3.0	3.5	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0			3.0		2.0	3.0	
Lost Time Adjust (s)		0.0	0.0		0.0			0.0		0.0	0.0	
Total Lost Time (s)		6.0	6.0		5.5			6.5		5.0	6.5	
Lead/Lag	Lag	Lag	Lag	Lead	Lead			Lead		Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0		3.0	3.0	
Recall Mode	None	None	None	None	None			C-Min		None	C-Min	
Walk Time (s)				7.0	7.0			7.0			7.0	
Flash Dont Walk (s)				11.0	11.0			13.0			13.0	
Pedestrian Calls (#/hr)				0	0			0			0	
Act Effct Green (s)		14.1	14.1		5.4			84.1		122.7	121.2	
Actuated g/C Ratio		0.09	0.09		0.04			0.56		0.82	0.81	
v/c Ratio		0.53	0.26		0.02			0.87		0.87	0.71	
Control Delay		74.7	2.8		0.3			30.4		81.0	19.6	
Queue Delay		0.0	0.0		0.0			0.7		57.2	0.0	
Total Delay		74.7	2.8		0.3			31.1		138.2	19.6	
LOS		E	A		A			C		F	B	
Approach Delay		43.4			0.3			31.1			50.3	
Approach LOS		D			A			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of 1st Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 40.1		Intersection LOS: D	
Intersection Capacity Utilization 90.4%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 3: TH 169/TH 47 & TH 10 S Ramp

Lanes, Volumes, Timings
6: TH 47 & TH 10 N Ramp

07/10/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	507	7	336	139	747	0	0	823	104
Future Volume (vph)	0	0	0	507	7	336	139	747	0	0	823	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	350		350	0		0	0		0
Storage Lanes	0		0	1		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	0.95	0.95	0.95	1.00	1.00	0.95	0.95
Frt					0.963	0.850					0.983	
Flt Protected				0.950	0.965			0.992				
Satd. Flow (prot)	0	0	0	1681	1575	1504	0	3511	0	0	3479	0
Flt Permitted				0.950	0.965			0.587				
Satd. Flow (perm)	0	0	0	1681	1575	1504	0	2078	0	0	3479	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					11	214					15	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		300			659			384			908	
Travel Time (s)		6.8			15.0			8.7			20.6	
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)	0	0	0	551	8	365	151	812	0	0	895	113
Shared Lane Traffic (%)				42%		21%						
Lane Group Flow (vph)	0	0	0	320	316	288	0	963	0	0	1008	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
Number of Detectors				2	2	2	1	2			2	
Detector Template							Left					
Leading Detector (ft)				126	126	126	20	126			126	
Trailing Detector (ft)				5	5	5	0	-5			5	
Detector 1 Position(ft)				5	5	5	0	-5			5	
Detector 1 Size(ft)				20	20	20	20	46			20	
Detector 1 Type				Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0	0.0	0.0	0.0			0.0	
Detector 1 Queue (s)				0.0	0.0	0.0	0.0	0.0			0.0	
Detector 1 Delay (s)				0.0	0.0	0.0	0.0	0.0			0.0	
Detector 2 Position(ft)				120	120	120		120			120	
Detector 2 Size(ft)				6	6	6		6			6	
Detector 2 Type				Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)				0.0	0.0	0.0		0.0			0.0	
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					
Detector Phase				8	8	8	5	2			6	

Existing

Lanes, Volumes, Timings
6: TH 47 & TH 10 N Ramp

07/10/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)				5.0	5.0	5.0	5.0	5.0			5.0	
Minimum Split (s)				22.5	22.5	22.5	9.5	24.5			22.5	
Total Split (s)				49.0	49.0	49.0	9.5	101.0			91.5	
Total Split (%)				32.7%	32.7%	32.7%	6.3%	67.3%			61.0%	
Maximum Green (s)				44.5	44.5	44.5	5.0	96.5			87.0	
Yellow Time (s)				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	
Lost Time Adjust (s)				0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)				4.5	4.5	4.5		4.5			4.5	
Lead/Lag							Lag				Lead	
Lead-Lag Optimize?							Yes				Yes	
Vehicle Extension (s)				3.0	3.0	3.0	3.0	3.0			3.0	
Recall Mode				None	None	None	None	C-Max			C-Max	
Walk Time (s)				7.0	7.0	7.0		7.0			7.0	
Flash Dont Walk (s)				11.0	11.0	11.0		13.0			11.0	
Pedestrian Calls (#/hr)				0	0	0		0			0	
Act Effct Green (s)				36.9	36.9	36.9		104.1			104.1	
Actuated g/C Ratio				0.25	0.25	0.25		0.69			0.69	
v/c Ratio				0.77	0.80	0.54		0.67			0.42	
Control Delay				65.0	65.9	16.0		7.1			11.1	
Queue Delay				6.5	8.4	0.0		1.8			0.1	
Total Delay				71.5	74.3	16.0		8.8			11.2	
LOS				E	E	B		A			B	
Approach Delay					55.2			8.8			11.2	
Approach LOS					E			A			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of 1st Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 24.4		Intersection LOS: C	
Intersection Capacity Utilization 79.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 6: TH 47 & TH 10 N Ramp

Measures of Effectiveness

3: TH 169/TH 47 & TH 10 S Ramp

Direction	All
Future Volume (vph)	3020
Total Delay / Veh (s/v)	40
CO Emissions (kg)	5.71
NOx Emissions (kg)	1.11
VOC Emissions (kg)	1.32

6: TH 47 & TH 10 N Ramp

Direction	All
Future Volume (vph)	2663
Total Delay / Veh (s/v)	24
CO Emissions (kg)	2.44
NOx Emissions (kg)	0.47
VOC Emissions (kg)	0.56

Build

Lanes, Volumes, Timings
9: TH 169/TH 47 & TH 10 EB Ramp/TH 10 WB Ramp

07/09/2018

Lane Group	EBL	EBR2	WBL	WBR2	NBL	NBT	NBR2	SBL	SBT	SBR2
Lane Configurations										
Traffic Volume (vph)	69	65	507	336	139	743	737	344	479	104
Future Volume (vph)	69	65	507	336	139	743	737	344	479	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0		300			300		
Storage Lanes	1		2		2			2		
Taper Length (ft)	25		25		50			50		
Lane Util. Factor	1.00	1.00	0.97	0.88	0.97	0.95	1.00	0.97	0.95	0.95
Frt		0.850		0.850			0.850		0.973	
Flt Protected	0.950		0.950		0.950			0.950		
Satd. Flow (prot)	1770	1583	3433	2787	3433	3539	1583	3433	3444	0
Flt Permitted	0.950		0.950		0.950			0.950		
Satd. Flow (perm)	1770	1583	3433	2787	3433	3539	1583	3433	3444	0
Right Turn on Red		Yes		Yes			Yes			Yes
Satd. Flow (RTOR)		236		365			765		236	
Link Speed (mph)						30			30	
Link Distance (ft)						3248			929	
Travel Time (s)						73.8			21.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	75	71	551	365	151	808	801	374	521	113
Shared Lane Traffic (%)										
Lane Group Flow (vph)	75	71	551	365	151	808	801	374	634	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)						24			24	
Link Offset(ft)						0			0	
Crosswalk Width(ft)						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
Turning Speed (mph)	25	15	25	15	25		15	25		15
Number of Detectors	1	1	1	1	1	1	1	1	1	
Detector Template		Right								
Leading Detector (ft)	50	20	50	50	50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	50	20	50	50	50	50	50	50	50	
Detector 1 Type	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	
Detector 1 Queue (s)	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	
Turn Type	Prot	Prot	Prot	Prot	Prot	NA	Perm	Prot	NA	
Protected Phases	4	5	8	1	5	2		1	6	
Permitted Phases							2			
Detector Phase	4	5	8	1	5	2	2	1	6	
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	22.0	12.0	22.0	12.0	12.0	24.0	24.0	12.0	24.0	
Total Split (s)	22.0	14.0	22.0	14.0	14.0	24.0	24.0	14.0	24.0	

Lanes, Volumes, Timings
9: TH 169/TH 47 & TH 10 EB Ramp/TH 10 WB Ramp

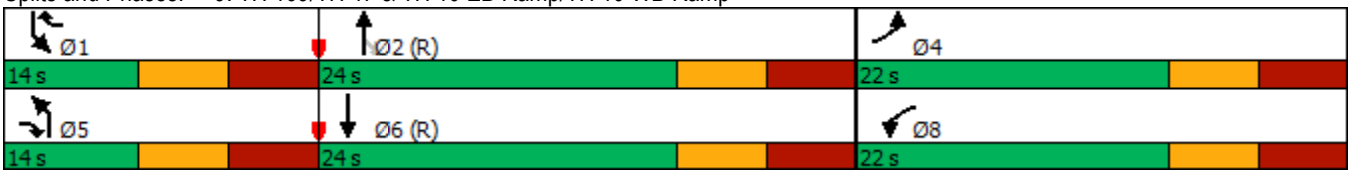
07/09/2018

Lane Group	EBL	EBR2	WBL	WBR2	NBL	NBT	NBR2	SBL	SBT	SBR2
Total Split (%)	36.7%	23.3%	36.7%	23.3%	23.3%	40.0%	40.0%	23.3%	40.0%	
Maximum Green (s)	14.0	6.0	14.0	6.0	6.0	16.0	16.0	6.0	16.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	
Lead/Lag		Lead		Lead	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?		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	
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max	
Walk Time (s)						5.0	5.0		5.0	
Flash Dont Walk (s)						11.0	11.0		11.0	
Pedestrian Calls (#/hr)						0	0		0	
Act Effct Green (s)	13.2	6.2	13.2	6.8	6.2	16.0	16.0	6.8	19.4	
Actuated g/C Ratio	0.22	0.10	0.22	0.11	0.10	0.27	0.27	0.11	0.32	
v/c Ratio	0.19	0.19	0.73	0.57	0.43	0.86	0.81	0.96	0.50	
Control Delay	20.1	1.1	28.1	7.5	29.4	32.3	11.0	68.5	12.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	20.1	1.1	28.1	7.5	29.4	32.3	11.0	68.5	12.8	
LOS	C	A	C	A	C	C	B	E	B	
Approach Delay						22.3			33.5	
Approach LOS						C			C	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 24.2 Intersection LOS: C
Intersection Capacity Utilization Err% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 9: TH 169/TH 47 & TH 10 EB Ramp/TH 10 WB Ramp



Measures of Effectiveness

07/09/2018

9: TH 169/TH 47 & TH 10 EB Ramp/TH 10 WB Ramp

Direction	All
Future Volume (vph)	3523
Total Delay / Veh (s/v)	24
CO Emissions (kg)	5.68
NOx Emissions (kg)	1.10
VOC Emissions (kg)	1.32

KEY:

XXX	TH 10 at TH 47 Interchange Crashes
XXX	Other Crashes

MNTH 47 From MNTH 10 to Nowthen Blvd Anoka County (2013 - 2015)

Crash data is managed by the Mn/DOT Office of Traffic, Safety, and Operations.

													PERSON1			PERSON2			PERSON3		
SYS	REF_POINT	MONTH	DAY	YEAR	TIME	SEV	NUM_VEH	SL	TYPE	DIAG	LOC1	TCD	VTYPE	DIR	ACT	VTYPE	DIR	ACT	VTYPE	DIR	ACT
03	**020+00.671**	**2**	**4**	**2015**	**0957**	**N**	**2**	**60**	**1**	**1**	**1**	**1**	**2**	**7**	**11**	**1**	**7**	**1**	**1**	**7**	
03	**020+00.671**	**3**	**3**	**2015**	**0832**	**N**	**2**	**60**	**1**	**1**	**1**	**98**	**3**	**7**	**1**	**1**	**7**	**10**			
03	020+00.671	3	8	2015	1255	A	2	30	1	3	1	1	3	5	1	11	7	54			
03	020+00.671	10	14	2014	0800	N	2	30	1	5	1	1	1	3	6	1	1	1			
03	020+00.671	10	24	2014	1345	N	2	30	1	2	1	1	3	5	1	2	5	14			
03	020+00.672	1	27	2015	1152	N	2	30	1	1	1	1	3	1	6	1	1	1			
03	020+00.672	4	6	2013	1716	N	2	30	1	2	1	1	1	5	14	3	5	1	3	5	
03	**020+00.672**	**12**	**18**	**2014**	**0750**	**N**	**3**	**60**	**1**	**1**	**1**	**98**	**1**	**7**	**11**	**2**	**7**	**10**	**1**	**7**	
03	020+00.676	5	26	2015	1854	N	2	30	1	2	1	98	4	1	1	2	0	0			
03	**020+00.701**	**3**	**24**	**2015**	**1630**	**N**	**2**	**65**	**1**	**1**	**1**	**98**	**1**	**3**	**11**	**1**	**3**	**1**			
03	020+00.703	5	23	2014	1535	N	3	30	1	3	1	1	3	1	1	2	5	6	99	5	
03	020+00.703	8	18	2015	1501	N	2	30	1	2	1	1	1	5	1	3	5	14			
03	020+00.720	1	6	2015	0906	N	2	30	1	1	1	1	3	5	1	4	5	1			

TH 10 from Thurston Avenue to Round Lake Blvd (2013 - 2015) - created on 06-21-2016 by rile1che

Crash data is managed by the Mn/DOT Office of Traffic, Safety, and Operations.

											PERSON1			PERSON2			PERSON3		
SYS	REF_POINT	MONTH	DAY	YEAR	TIME	SEV	SL	TYPE	DIAG	TCD	VTYPE	DIR	ACT	VTYPE	DIR	ACT	VTYPE	DIR	ACT
02	225+00.326	9	23	2014	1615	N	60	1	1	98	1	7	10	1	7	1			
02	225+00.307	6	13	2014	1645	N	60	1	1	98	3	7	1	2	7	11			
02	225+00.232	4	23	2013	0515	N	60	32	4	98	1	7	1						
02	225+00.232	4	19	2013	0441	C	35	1	5	1	1	7	57	35	5	1			
02	225+00.232	8	21	2014	0815	N	30	1	5	1	1	7	6	4	1	1			
02	225+00.232	3	25	2015	1107	N	60	12	90	98	4	7	1	2	7	0			
02	225+00.213	10	15	2014	0805	N	60	1	2	98	4	7	14	1	7	1			
02	225+00.192	3	3	2015	1113	N	60	32	5	98	4	7	1						
02	225+00.175	8	24	2013	1829	N	45	1	1	98	1	7	11	1	7	1	2	7	
02	225+00.114	8	16	2013	1415	N	55	1	1	99	1	7	1	4	7	1			
02	225+00.087	12	24	2015	0822	N	60	34	8	98	1	7	1						
02	225+00.058	5	29	2015	1936	N	60	32	2	98	1	7	14						
02	225+00.057	4	22	2013	1705	N	60	1	1	98	3	7	1	1	7	1			
02	225+00.042	10	28	2015	0731	N	60	1	1	98	3	7	1	3	7	11	1	7	
02	225+00.025	11	15	2013	1810	N	60	1	1	98	1	7	10	1	7	10	2	7	
02	225+00.025	6	19	2014	0042	C	55	8	8	98	1	7	1						
02	225+00.018	1	9	2014	0800	C	55	1	1	98	3	7	1	1	7	14			
02	225+00.015	9	15	2014	0651	N	60	1	1	98	1	7	1	1	7	10			
02	225+00.011	1	16	2015	1532	N	60	1	8	98	1	7	1	3	7	0			
02	224+00.976	4	6	2015	1704	N	60	1	1	98	4	7	1	3	7	1			
02	224+00.970	9	19	2013	1045	N	60	34	90	98	1	7	1						
02	**224+00.943**	**10**	**10**	**2014**	**1812**	**N**	**30**	**1**	**1**	**1**	**4**	**7**	**1**	**1**	**7**	**1**			
02	224+00.925	3	24	2015	1518	N	50	1	1	1	3	1	5	2	1	1			
02	224+00.815	4	10	2015	2109	N	30	1	1	1	1	1	1	2	1	1	1	1	
02	224+00.812	8	15	2014	2155	N	30	1	1	1	1	4	11	1	4	10			
02	224+00.807	12	14	2015	0732	N	35	1	1	1	1	4	3	3	4	1			
02	224+00.807	7	15	2013	1706	N	35	1	2	1	2	8	5	2	8	14			
02	224+00.807	7	27	2014	1817	N	35	1	2	98	1	3	1	1	3	15			
02	224+00.807	7	12	2015	0858	N	30	1	5	1	3	5	1	1	4	5			
02	224+00.807	9	7	2013	2002	N	30	1	99	1	3	5	1	1	6	6			
02	224+00.692	5	19	2014	1558	N	30	1	2	1	2	1	1	3	1	14			
02	224+00.674	3	5	2014	1655	N	30	2	1	1	1	5	11	31	5	10			

USTH 169 from MNTH 10 to Main Street Anoka County (2013-2015)

Crash data is managed by the Mn/DOT Office of Traffic, Safety, and Operations.

												PERSON1			PERSON2			PERSON3		
SYS	REF_POINT	MONTH	DAY	YEAR	TIME	SEV	NUM_VEH	SL	TYPE	DIAG	TCD	VTYPE	DIR	ACT	VTYPE	DIR	ACT	VTYPE	DIR	ACT
02	146+00.461	8	6	2014	1244	N	3	30	1	1	1	1	1	11	3	1	11	2	1	
02	146+00.462	1	30	2014	1437	N	2	30	1	1	98	2	1	11	2	1	1			
02	146+00.480	10	5	2015	1619	N	3	30	1	1	98	3	1	11	3	1	11	2	1	
02	146+00.483	2	1	2013	1558	N	2	30	1	5	98	3	4	9	1	5	5			
02	146+00.533	11	5	2013	0730	N	2	35	1	1	1	1	5	1	2	5	1			
02	146+00.544	3	6	2013	1542	N	3	30	1	1	98	3	1	1	2	1	1	1	1	
02	146+00.544	5	31	2014	1254	N	2	30	1	1	1	1	5	9	1	5	1	1	5	
02	146+00.545	9	4	2015	0929	N	2	35	1	5	1	1	3	6	2	5	1	2	5	
02	146+00.549	1	10	2013	1715	N	2	30	1	1	98	4	1	10	1	1	10			
02	146+00.633	10	5	2014	2316	C	2	30	2	1	98	1	5	18	2	5	1			
02	146+00.633	12	12	2014	1707	N	2	30	1	1	98	3	1	1	1	1	1			
02	146+00.635	7	24	2014	0830	N	2	30	1	1	98	1	1	1	8	1	1	8	1	
02	146+00.653	6	19	2013	1422	C	5	35	1	1	98	1	1	11	1	1	11	1	1	
02	146+00.653	6	27	2013	1603	N	2	30	1	1	1	1	1	10	1	1	10			
02	146+00.700	5	10	2014	1059	N	2	30	1	5	98	1	7	37	2	1	1			
02	146+00.700	12	30	2014	1756	N	2	30	1	1	98	1	1	11	1	1	1			
02	146+00.717	1	10	2014	1749	C	4	30	1	1	98	2	1	1	4	1	11	1	1	
02	146+00.717	7	27	2014	1328	N	2	30	1	1	1	1	1	10	3	1	1			
02	146+00.717	9	18	2015	1222	C	2	30	1	3	98	3	5	1	1	6	6	3	5	
02	146+00.725	6	19	2014	2057	N	2	30	1	1	98	1	1	1	1	1	1			
02	146+00.726	2	4	2013	1540	N	2	30	1	1	98	1	1	1	1	1	1			
02	146+00.734	12	16	2014	1634	N	2	30	1	1	98	2	1	10	1	1	1			
02	146+00.736	1	4	2013	1252	N	2	30	1	1	98	4	1	14	1	1	11			
02	146+00.736	2	14	2014	1540	N	3	30	1	1	1	2	1	11	4	1	1	4	1	
02	146+00.736	2	19	2014	2054	A	2	30	1	5	98	1	5	1	1	2	6	1	2	
02	146+00.736	2	20	2014	0700	B	4	30	1	1	1	3	1	11	3	1	11	3	1	
02	146+00.736	5	20	2014	0551	N	2	30	1	5	4	4	1	1	1	3	6	4	1	
02	146+00.736	7	16	2013	0951	N	2	30	1	5	4	1	3	6	3	5	1			
02	146+00.745	5	13	2013	1244	C	3	35	1	1	98	4	1	11	4	1	1	3	1	
02	146+00.774	1	30	2014	1211	N	2	30	1	90	98	1	6	17	2	1	1			
02	146+00.777	3	27	2013	2128	N	2	30	1	1	98	3	1	1	3	1	1			
02	146+00.800	5	30	2015	1512	N	2	30	1	1	4	1	5	1	1	5	1			
02	146+00.804	1	27	2013	1451	N	2	30	1	1	1	2	1	1	1	1	1			
02	146+00.806	1	5	2013	1003	N	2	35	1	1	1	2	1	1	3	1	11			
02	146+00.806	3	5	2013	0317	N	2	30	1	2	1	1	1	1	2	1	5			
02	146+00.806	5	28	2013	1422	N	2	30	1	1	1	3	1	11	1	1	0			
02	146+00.806	9	20	2015	1812	N	2	30	1	1	1	2	1	1	1	1	11			
02	**146+00.855**	**1**	**27**	**2014**	**0555**	**C**	**1**	**30**	**51**	**7**	**98**	**2**	**5**	**1**						
02	146+00.874	1	3	2013	1402	C	2	35	1	1	1	1	1	1	3	1	1			
02	146+00.874	1	30	2014	1018	N	2	30	1	3	1	2	5	1	1	8	6	2	5	

USTH 169 from MNTH 10 to Main Street Anoka County (2013-2015)

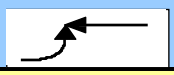
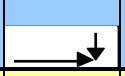
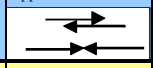
Crash data is managed by the Mn/DOT Office of Traffic, Safety, and Operations.

												PERSON1			PERSON2			PERSON3		
SYS	REF_POINT	MONTH	DAY	YEAR	TIME	SEV	NUM_VEH	SL	TYPE	DIAG	TCD	VTYPE	DIR	ACT	VTYPE	DIR	ACT	VTYPE	DIR	ACT
02	146+00.874	3	25	2014	1725	N	2	30	1	2	1	1	5	99	1	5	10			
02	146+00.874	3	28	2013	0855	N	2	35	1	5	1	3	5	1	4	1	6	3	5	
02	146+00.874	5	22	2014	1600	N	1	30	1	1	1	1	1	6						
02	146+00.874	5	24	2013	0955	C	2	30	1	1	1	1	5	1	1	5	11			
02	146+00.874	6	9	2015	1259	N	3	35	1	1	1	2	1	1	1	1	10	1	1	
02	146+00.874	6	15	2013	1639	N	3	30	1	1	1	3	5	11	1	5	10	2	5	
02	146+00.874	6	24	2013	0757	N	2	30	1	1	1	1	5	11	1	5	1			
02	146+00.874	6	24	2013	1205	N	2	30	1	1	1	1	5	11	1	5	1			
02	146+00.874	6	27	2014	1030	C	2	35	1	1	1	1	1	14	1	1	14			
02	146+00.874	7	27	2014	1321	N	2	30	1	1	98	2	1	1	1	1	11	1	1	
02	146+00.874	7	29	2015	1614	N	2	30	1	5	1	31	7	6	1	5	1			
02	146+00.874	8	8	2013	1521	N	2	30	1	5	1	1	7	6	2	5	1			
02	146+00.874	8	23	2013	0718	B	2	35	1	3	1	3	5	6	1	1	1			
02	146+00.874	8	27	2014	0746	N	2	30	1	1	1	4	7	11	1	7	1			
02	146+00.874	9	6	2015	1029	N	2	30	1	1	1	3	2	5	1	2	1	3	2	
02	146+00.874	9	15	2014	0625	N	2	30	1	3	1	3	5	1	1	1	6			
02	146+00.874	9	21	2015	1240	C	2	30	1	3	1	1	7	6	11	5	1	1	7	
02	146+00.874	9	23	2013	0818	N	2	30	1	2	1	35	6	6	2	6	11			
02	146+00.874	9	23	2015	1027	N	2	30	1	3	1	1	4	6	1	1	1			
02	146+00.874	9	30	2015	1630	C	2	30	1	5	1	1	7	6	1	5	1	1	7	
02	146+00.874	10	1	2013	1814	N	2	30	1	6	1	1	8	5	1	8	5	1	8	
02	146+00.874	10	15	2014	0544	N	2	30	1	2	1	4	5	6	1	5	1			
02	146+00.874	10	31	2013	1811	N	2	30	1	2	1	1	1	1	2	1	14			
02	146+00.874	11	3	2014	0820	N	2	30	1	1	1	3	1	11	4	1	1			
02	146+00.874	11	16	2013	1912	N	2	30	1	3	1	1	5	1	4	8	6			
02	**146+00.874**	**11**	**20**	**2013**	**0650**	**N**	**2**	**60**	**1**	**2**	**1**	**2**	**8**	**5**	**35**	**8**	**5**			
02	146+00.874	11	20	2014	0646	C	5	60	1	90	98	3	7	13	1	7	1	1	7	
02	146+00.874	12	7	2013	1200	N	2	30	1	5	1	3	2	6	1	5	1			
02	**146+00.874**	**12**	**7**	**2013**	**0910**	**N**	**2**	**30**	**1**	**1**	**1**	**1**	**5**	**1**	**4**	**5**	**14**			
02	146+00.874	12	19	2014	1912	N	2	30	1	1	1	3	5	5	1	5	10			

HSIP worksheet

Control Section	T.H. / Roadway	Location	Beginning Ref. Pt.	Ending Ref. Pt.	State, County, City or Township	Study Period Begins	Study Period Ends
	T.H. 10	T.H. 10 at T.H 47-T.H. 169			Anoka County	1/1/2013	12/31/2015

Description of Proposed Work

Accident Diagram Codes			1 Rear End 	2 Sideswipe Same Direction 	3 Left Turn Main Line 	5 Right Angle 	4,7 Ran off Road 	8, 9 Head On/ Sideswipe - Opposite Direction 	Pedestrian	6, 90, 99 Other	Total
Study Period: Number of Crashes	Fatal	**F**									
	Personal Injury (PI)	**A**			1						**1**
		B	1		1						**2**
		C	7		1	2		1			**11**
	Property Damage	**PD**	53	15	5	8	2	2		4	**89**
% Change in Crashes *Use Desktop Reference for Crash Reduction Factors	Fatal	**F**									
	PI	**A**			-62%						
		B	-62%		-62%						
		C	-62%		-62%	-62%		-62%			
	Property Damage	**PD**	-62%	-62%	-62%	-62%	-62%	-62%		-62%	
Change in Crashes = No. of crashes **X** % change in crashes	Fatal	**F**									
	PI	**A**			**-0.62**						**-0.62**
		B	**-0.62**		**-0.62**						**-1.24**
		C	**-4.34**		**-0.62**	**-1.24**		**-0.62**			**-6.82**
	Property Damage	**PD**	**-32.86**	**-9.30**	**-3.10**	**-4.96**	**-1.24**	**-1.24**		**-2.48**	**-55.18**

Year (Safety Improvement Construction) **2025**

Project Cost (exclude Right of Way) **$ 27,130,969**

Right of Way Costs (optional)

Traffic Growth Factor **3.0%**

Capital Recovery

1. Discount Rate **4.5%**

2. Project Service Life (n) **30**

Type of Crash	Study Period: Change in Crashes	Annual Change in Crashes	Cost per Crash	Annual Benefit
F			**$ 1,140,000**	
A	**-0.62**	**-0.21**	**$ 570,000**	**$ 117,908**
B	**-1.24**	**-0.41**	**$ 170,000**	**$ 70,331**
C	**-6.82**	**-2.28**	**$ 83,000**	**$ 188,859**
PD	**-55.18**	**-18.41**	**$ 7,600**	**$ 139,917**
Total				**$ 517,015**

B/C= 0.47

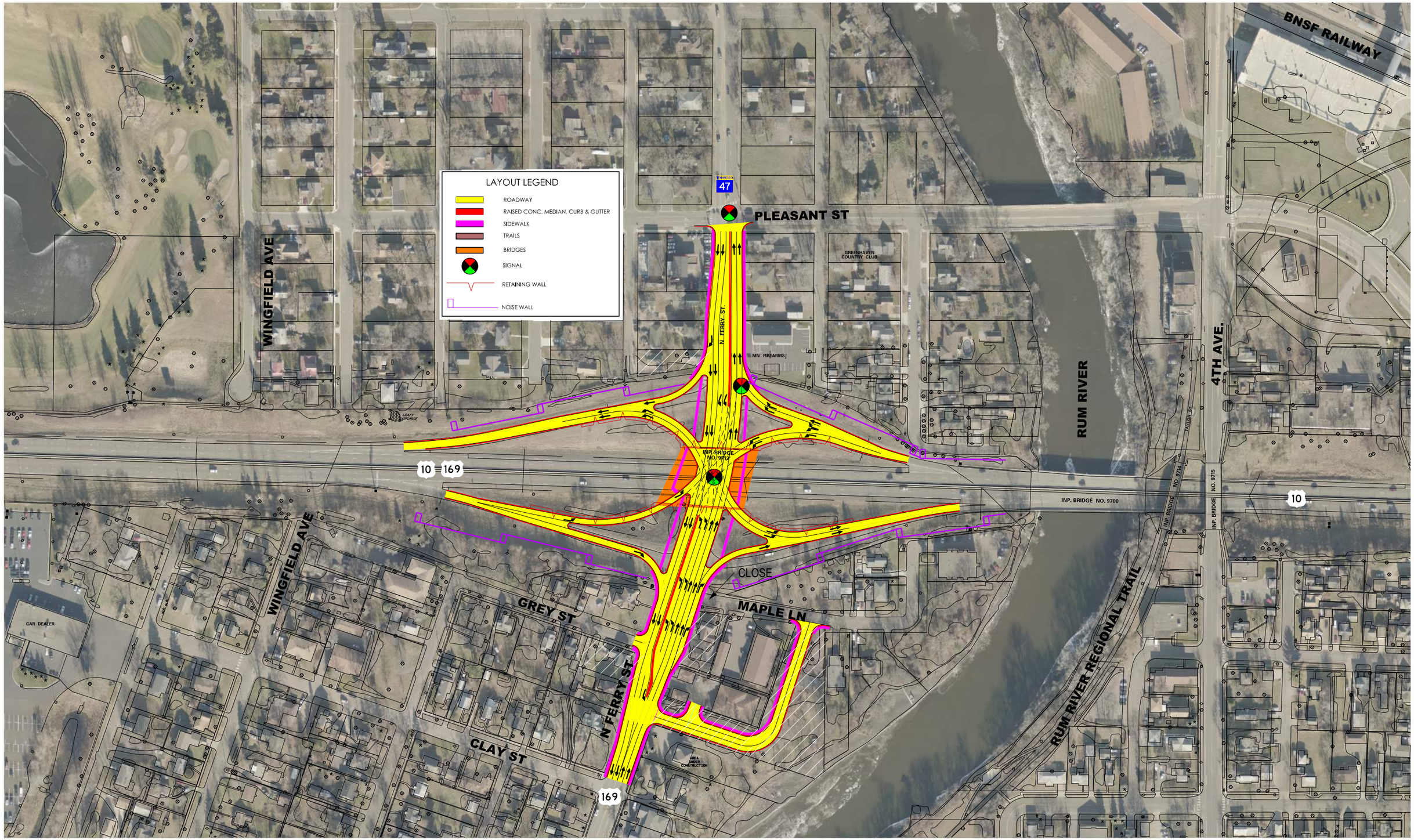
Using present worth values,

B= $ 12,675,733

C= $ 27,130,969

See "Calculations" sheet for amortization.

Office of Traffic, Safety and Technology **August 2015**



BOLTON & MENK

DEPARTMENT OF TRANSPORTATION

0 100 200
SCALE FEET

TH169/TH 47 AND TH10 INTERCHANGE PROJECT

DRAFT

JULY 2018
CITY OF ANOKA

H:\MDOT\T44\116547\CADD\WS\figures\p16547_LAYOUT_200_SPUT3_only.dgn

ANOKA
REAL. CLASSIC.

Public Services – Engineering

July 3, 2018

Dan Mattison, P.E.
Senior Project Manager
MnDOT Metro Division
1500 W. County Road B-2
Roseville, MN 55113

RE: Support for Highway 169 and MN Highway 47 Interchange Improvements

Dear Mr. Mattison:

The City of Anoka supports the Minnesota Department of Transportation's (MnDOT) interchange improvement project at Highway 169 and MN Highway 47/Ferry Street in the City of Anoka. The city understands that MnDOT is applying to the Regional Solicitation program for federal transportation funding for these improvements, focusing on safety, access, and mobility. The City of Anoka recognizes that the impacts of project improvements are regionally significant in addition to benefitting traffic flows and access management within the city.

The Highway 169/MN Highway 47 interchange is a critical link for freight movement in the region. Highway 169 is a Tier 2 Freight Corridor; and MN Highway 47 is a Tier 3 Freight Corridor, as identified by the Metropolitan Council's 2017 Freight Study. Additionally, the Highway 169/MN Highway 47 interchange is one of four key north-south connections in the City of Anoka's transportation network. As a result this intersection experiences higher levels of traffic and frequent delays, negatively impacting both regional and local travel, businesses, and residents.

The city believes the proposed improvements will greatly improve safety, mobility, and reliability at the interchange for both city and regional travel. The project improvements will support economic development and vitality of businesses and industries in the region. The improvements will also support the projected population and traffic growth expected both within the City of Anoka and the region.

Sincerely,

Greg Lee

Greg Lee
City Manager, City of Anoka

Anoka County
TRANSPORTATION DIVISION
Highway

Douglas W. Fischer, PE
County Engineer

July 10, 2018

Mr. Dan Mattison, P.E.
Senior Project Manager
MnDOT Metro Division
1500 W. County Road B-2
Roseville, MN 55113

RE: Support for Highway 169/MN Highway 47 Interchange Improvements

Dear Mr. Mattison:

Anoka County supports the advancement of the US Highway 169 improvements at the MN Highway 47/Ferry Street interchange in the City of Anoka. The County understands that MnDOT is applying for federal funding through the 2018 Metropolitan Council's Regional Solicitation program to improve safety, mobility, and reduce traffic congestion at this key interchange.

The County recognizes that the impacts of these interchange improvements are regionally significant. The US Highway 169/MN Highway 47 interchange is a critical link for freight movement in the region. US Highway 169 is a Tier 2 Freight Corridor and MN Highway 47 is a Tier 3 Freight Corridor, as identified by the Metropolitan Council's 2017 Freight Study. As such, this interchange sees high levels of traffic and frequent delays.

Anoka County believes the proposed US Highway 169/MN Highway 47 interchange improvements will reduce traffic congestion at this interchange and will greatly improve the safety and reliability of MN Highway 47 corridor for the region. This project will also support the population and traffic growth expected in the region while bolstering economic development.

Sincerely,

FOR Douglas W. Fischer, P.E.
Transportation Division Manager / County Engineer

DEPARTMENT OF TRANSPORTATION

MnDOT

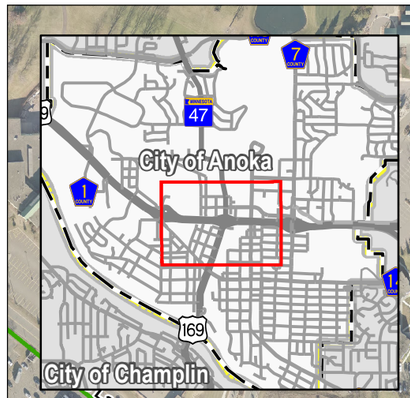
TH 169 - MN 47 - TH 10 Interchange Project

Current Conditions

July 2018

BOLTON & MENK

Real People. Real Solutions.



Ferry St N

Martin St

Johnson St

BNSF Railway

3900

Anoka Station (NorthStar)

Pleasant St

Front Ave

Maple Ave

19200

Short ramps mean queues often extend to Hwy 10

Pierce St

City of Anoka

4th Ave

North St

Service Rd

Main St

Church St

52000

52000

66000

10

169

Short ramps mean queues often extend to Hwy 10

Gray St

Maple La

Inadequate intersection access spacing

Rum River Regional Trial

Taylor St

Mill Ave

Water St

Clay St

Wingfield Ave

Branch Ave

State Ave

Polk St

5th Ave

3rd Ave

Tyler St

Calhoun St

Harrison St

6th St

25500

2nd Ave

Webster St

Legend

- Pedestrian Crashes (2006-2015)
- Bike Crashes (2006-2015)
- Incapacitating Injury
- Fatal Injury
- City Trails
- Rum River Regional Trail
- Railroad

Average Annual Daily Traffic (AADT)

2015 Data

0 500 Feet

Source: Anoka County, MnDOT

Map Document: C:\Users\yatao\Desktop\116547 current conditions 11x17MB.mxd | Date Saved: 7/12/2018 3:48:23 PM

ANOKA
REAL. CLASSIC.

Public Services – Engineering

July 3, 2018

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Anoka County
TRANSPORTATION DIVISION
Highway

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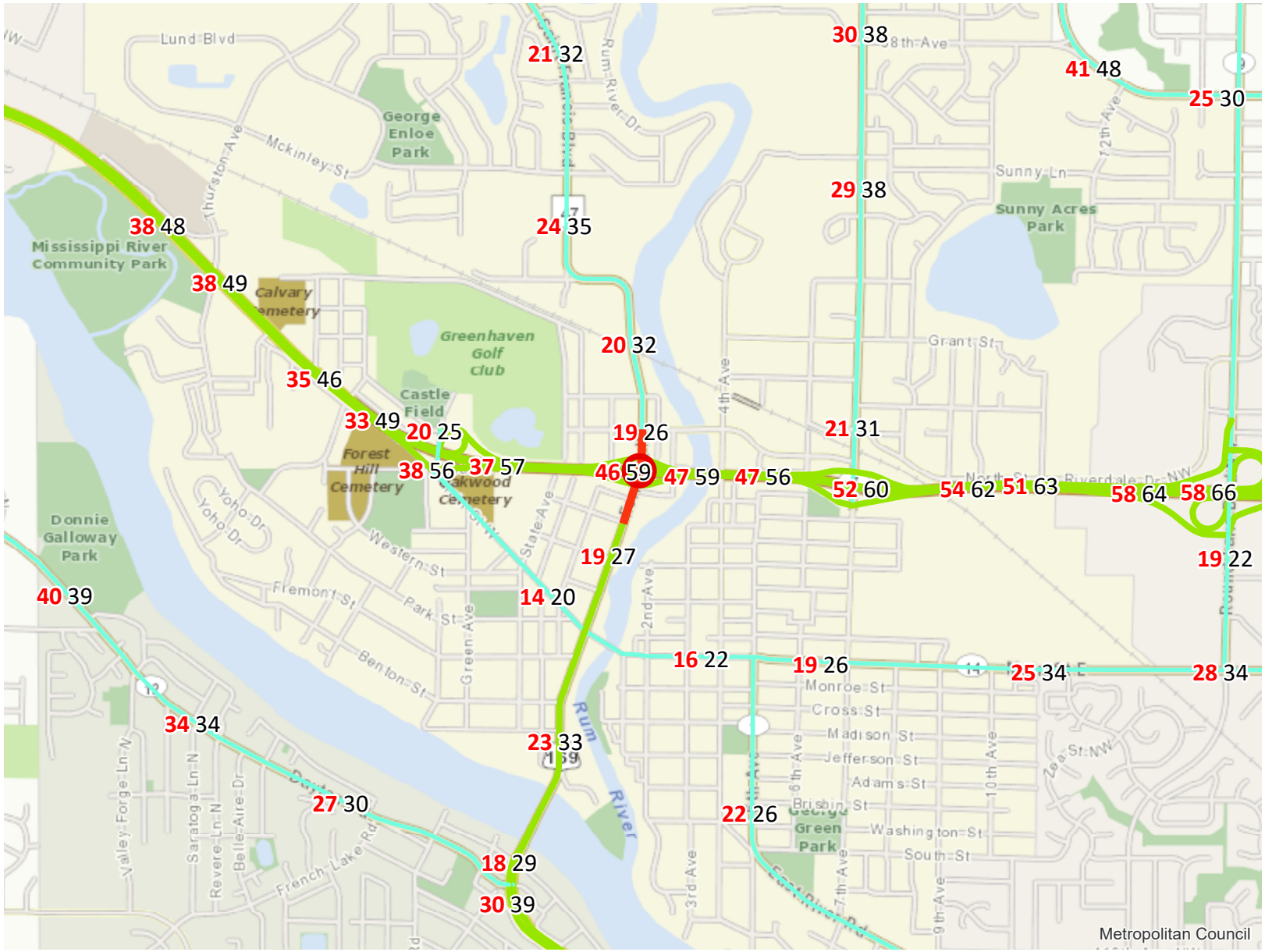
FOR Douglas W. Fischer, P.E.
Transportation Division Manager / County Engineer

Level of Congestion

Roadway Reconstruction/Modernization Project: TH 169/Ferry Street Interchange Seg 1 | Map ID: 1530880653881



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

0 0.25 0.5 1 1.5 2 Miles

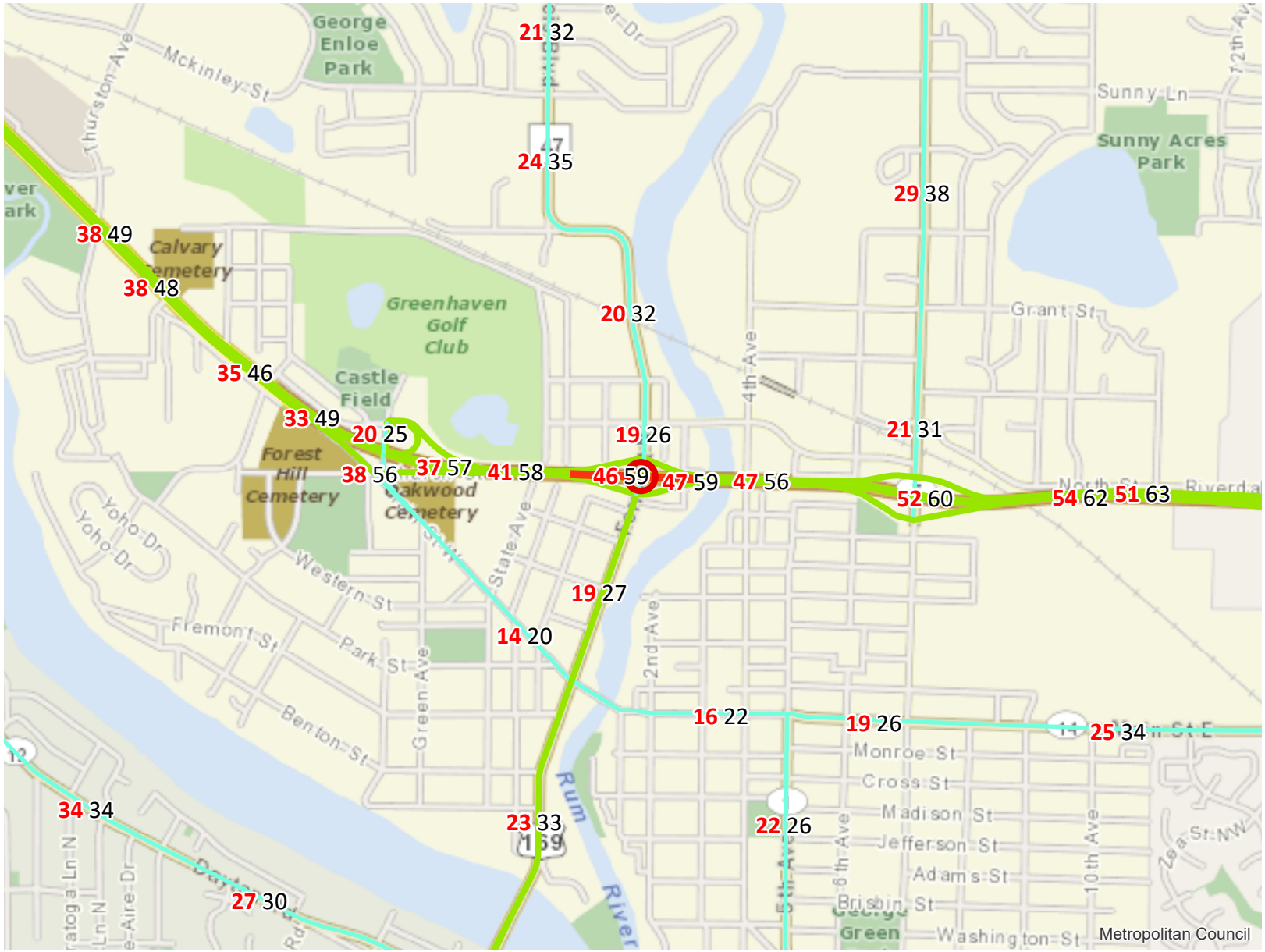
Created: 7/6/2018
LandscapeRSA1

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

METROPOLITAN COUNCIL

Level of Congestion

Roadway Reconstruction/Modernization Project: TH 169/Ferry Street Interchange | Map ID: 1531159155527



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

0 0.175 0.35 0.7 1.05 1.4 Miles

Created: 7/9/2018
LandscapeRSA1

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

METROPOLITAN COUNCIL

Regional Economy

Roadway Reconstruction/Modernization Project: TH 169/Ferry Street Interchange Seg 1 | Map ID: 1530880653881

Results

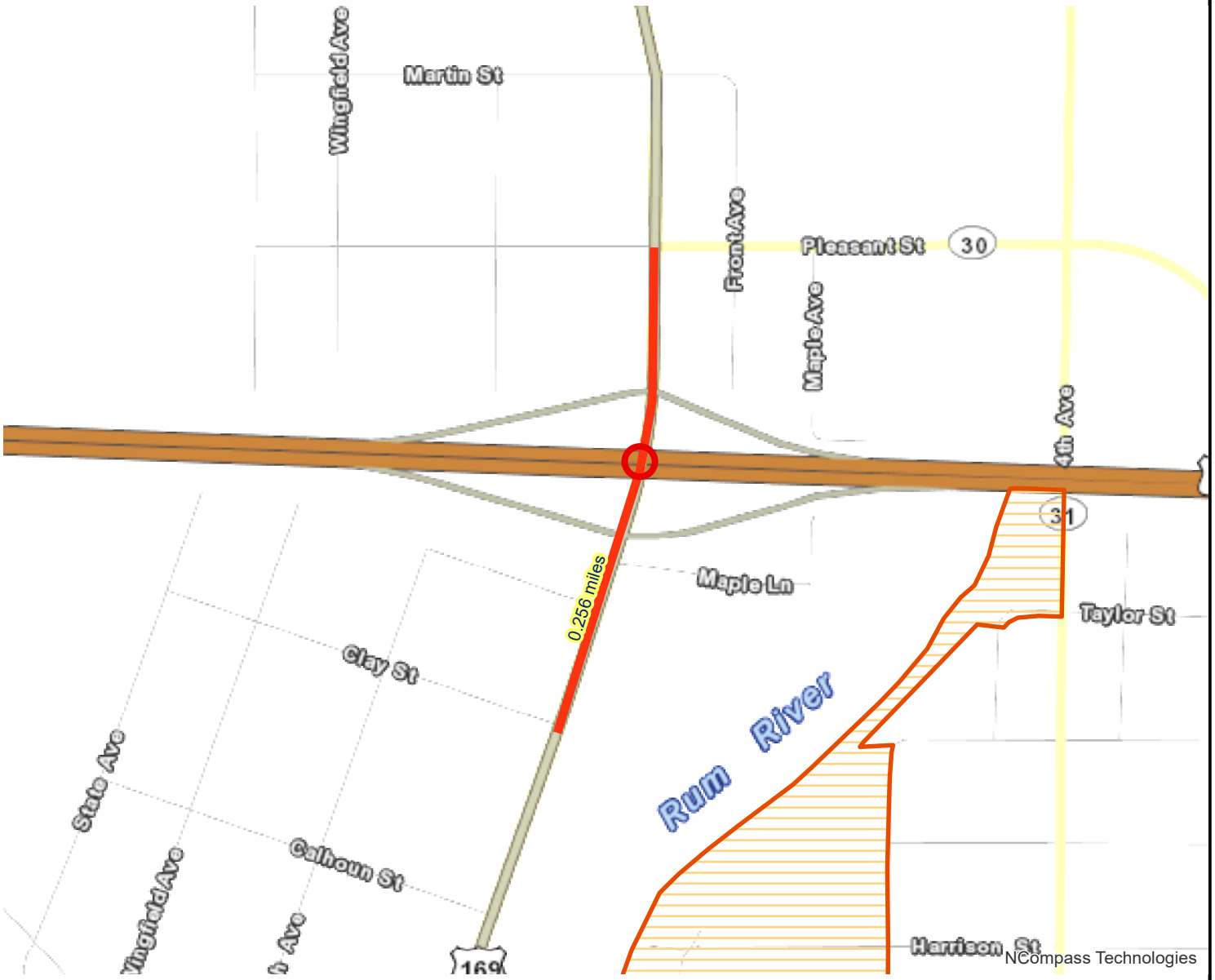
WITHIN ONE MI of project:
Postsecondary Students: 0

Totals by City:

Anoka
Population: 15433
Employment: 12393
Mfg and Dist Employment: 3665

Champlin
Population: 1889
Employment: 106
Mfg and Dist Employment: 1

Coon Rapids
Population: 4067
Employment: 318
Mfg and Dist Employment: 11



Project Points
Project
Manfacturing/Distribution Centers
Job Concentration Centers

0 0.05 0.1 0.2 0.3 0.4 Miles

Created: 7/6/2018
LandscapeRSA5

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

METROPOLITAN COUNCIL

Regional Economy

Roadway Reconstruction/Modernization Project: TH 169/Ferry Street Interchange | Map ID: 1531159155527

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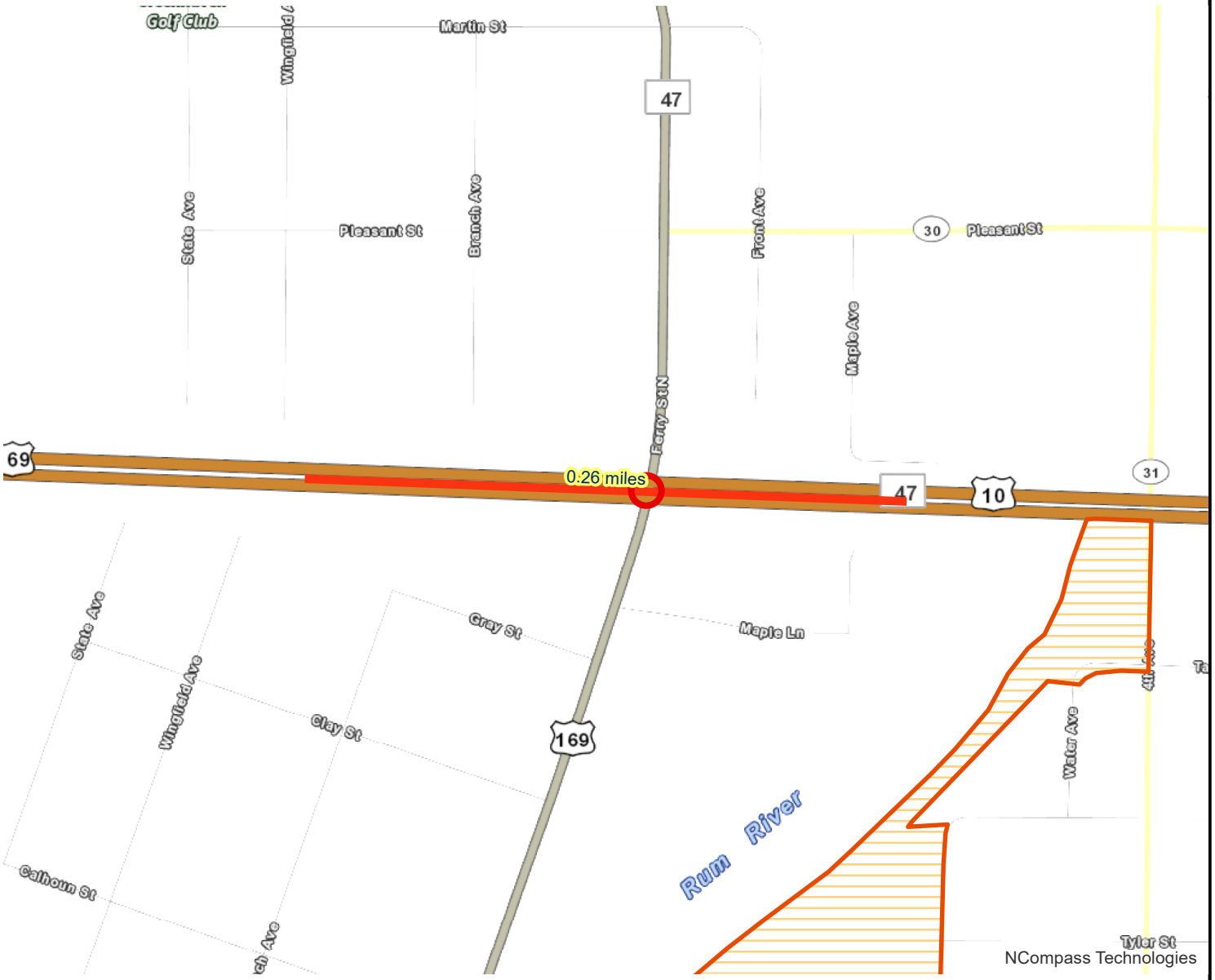


Project Points
Project
Manfacturing/Distribution Centers
Job Concentration Centers

0 0.0425 0.085 0.17 0.255 0.34 Miles

Created: 7/9/2018
LandscapeRSA5

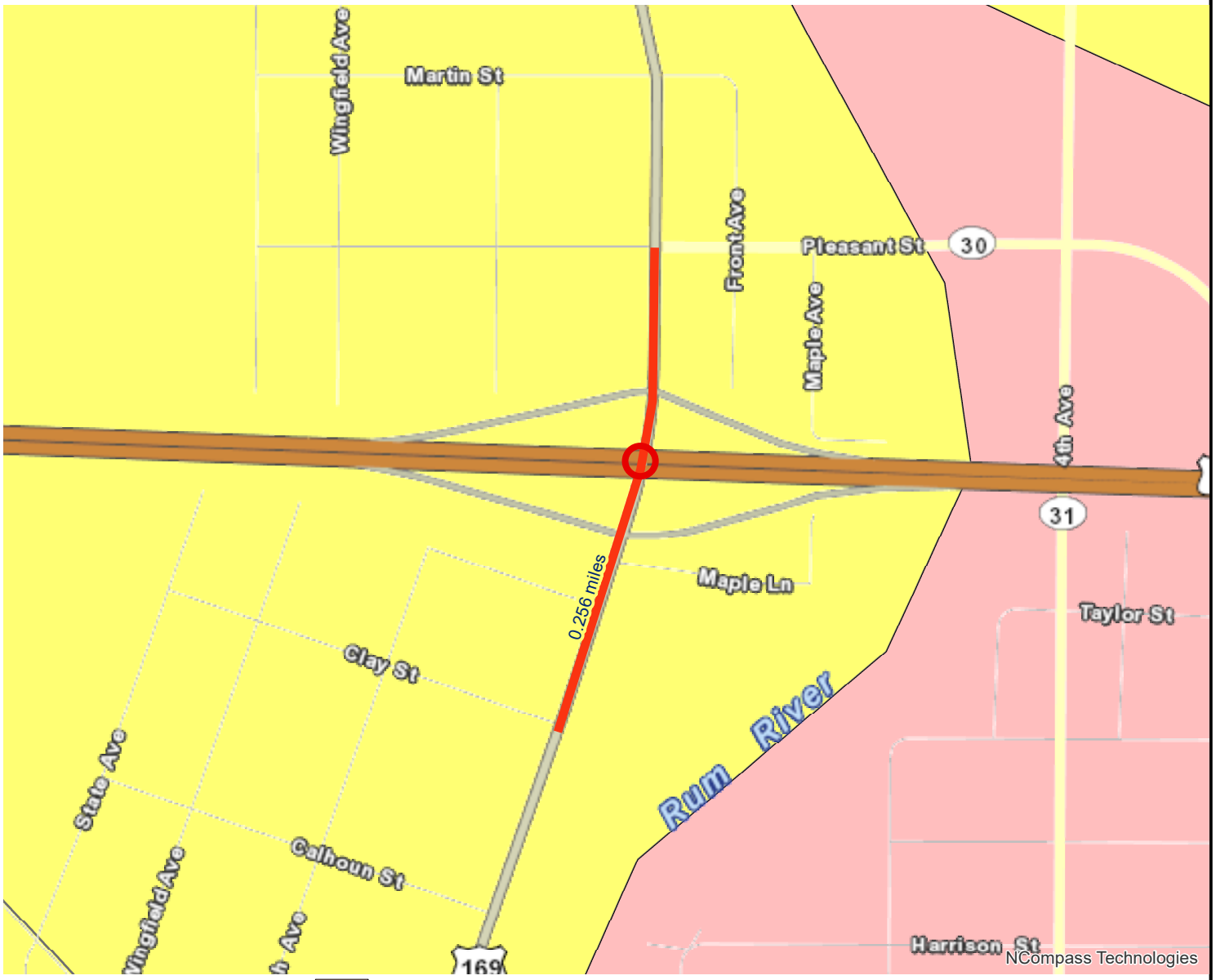
METROPOLITAN COUNCIL

Socio-Economic Conditions

Roadway Reconstruction/Modernization Project: TH 169/Ferry Street Interchange Seg 1 | Map ID: 1530880653881

Results

Project census tracts are above the regional average for population in poverty or population of color:
(0 to 18 Points)



Project Points
Project
Area of Concentrated Povertry > 50% residents of color
Area of Concentrated Poverty
Above reg'l avg conc of race/poverty

0 0.05 0.1 0.2 0.3 0.4 Miles

Created: 7/6/2018
LandscapeRSA2

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

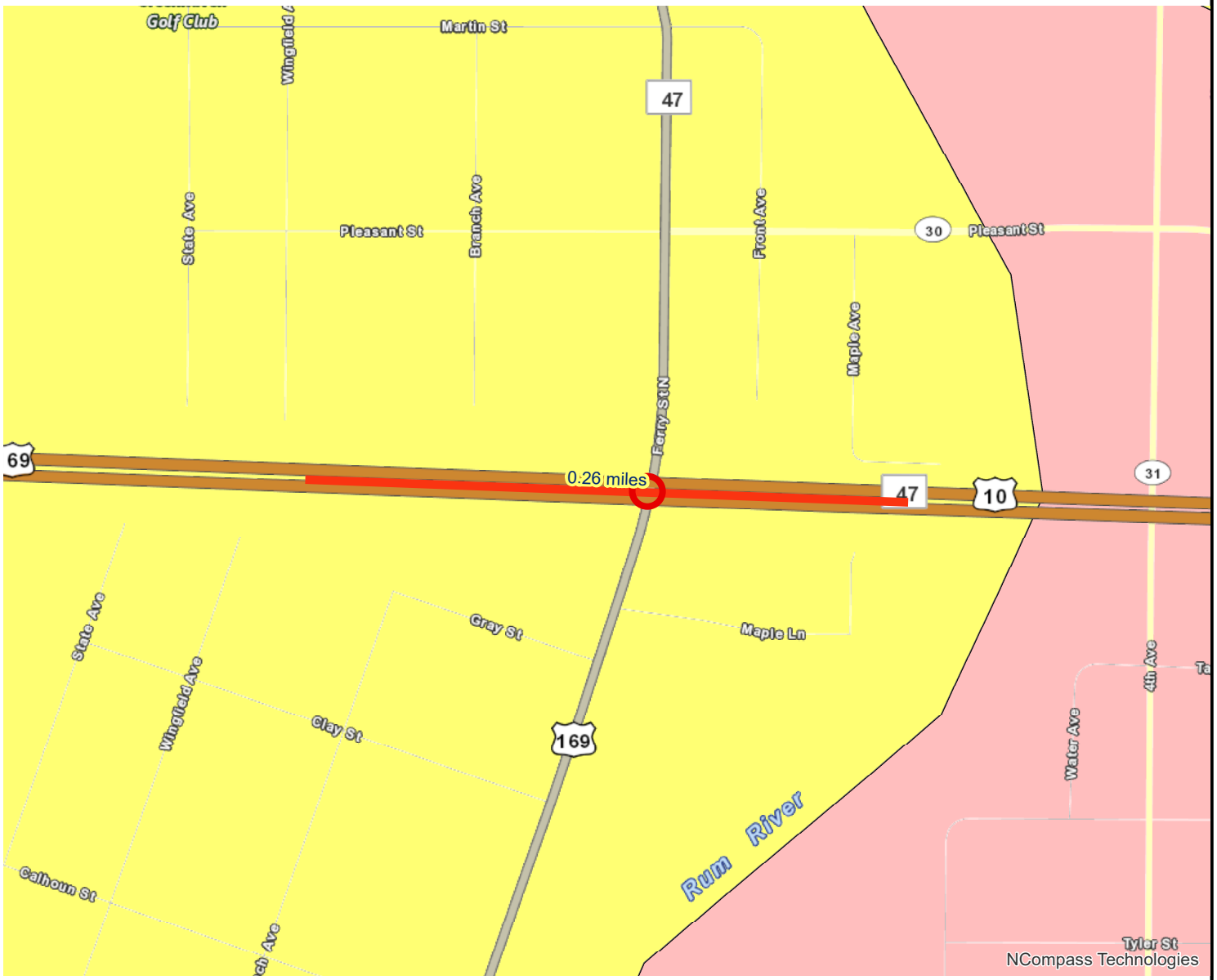
METROPOLITAN COUNCIL

Socio-Economic Conditions

Roadway Reconstruction/Modernization Project: TH 169/Ferry Street Interchange | Map ID: 1531159155527

Results

Project census tracts are above the regional average for population in poverty or population of color:
(0 to 18 Points)



Project Points

Project

Area of Concentrated Povertry > 50% residents of color

Area of Concentrated Poverty

Above reg'l avg conc of race/poverty

0 0.0425 0.085 0.17 0.255 0.34 Miles

Created: 7/9/2018
LandscapeRSA2

For complete disclaimer of accuracy, please visit
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METROPOLITAN COUNCIL

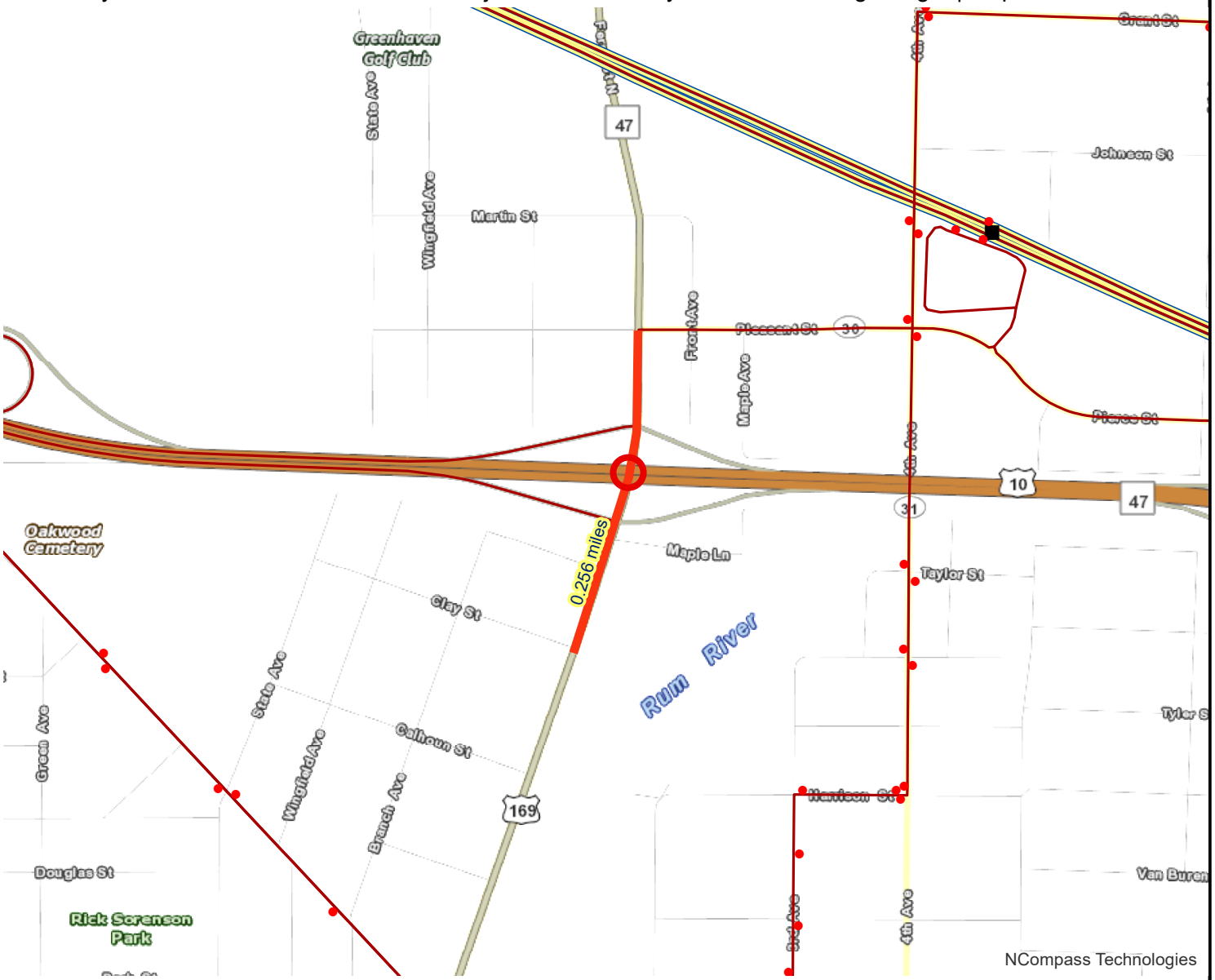
Transit Connections

Roadway Reconstruction/Modernization Project: TH 169/Ferry Street Interchange Seg 1 | Map ID: 1530880653881

Results

Transit with a Direct Connection to project: 887

**indicates Planned Alignments*



Project Points • Active Stop **Transitway Stations** — Transit Routes **Transitway**

Project ■ Northstar Line Northstar Line

0 0.075 0.15 0.3 0.45 0.6 Miles

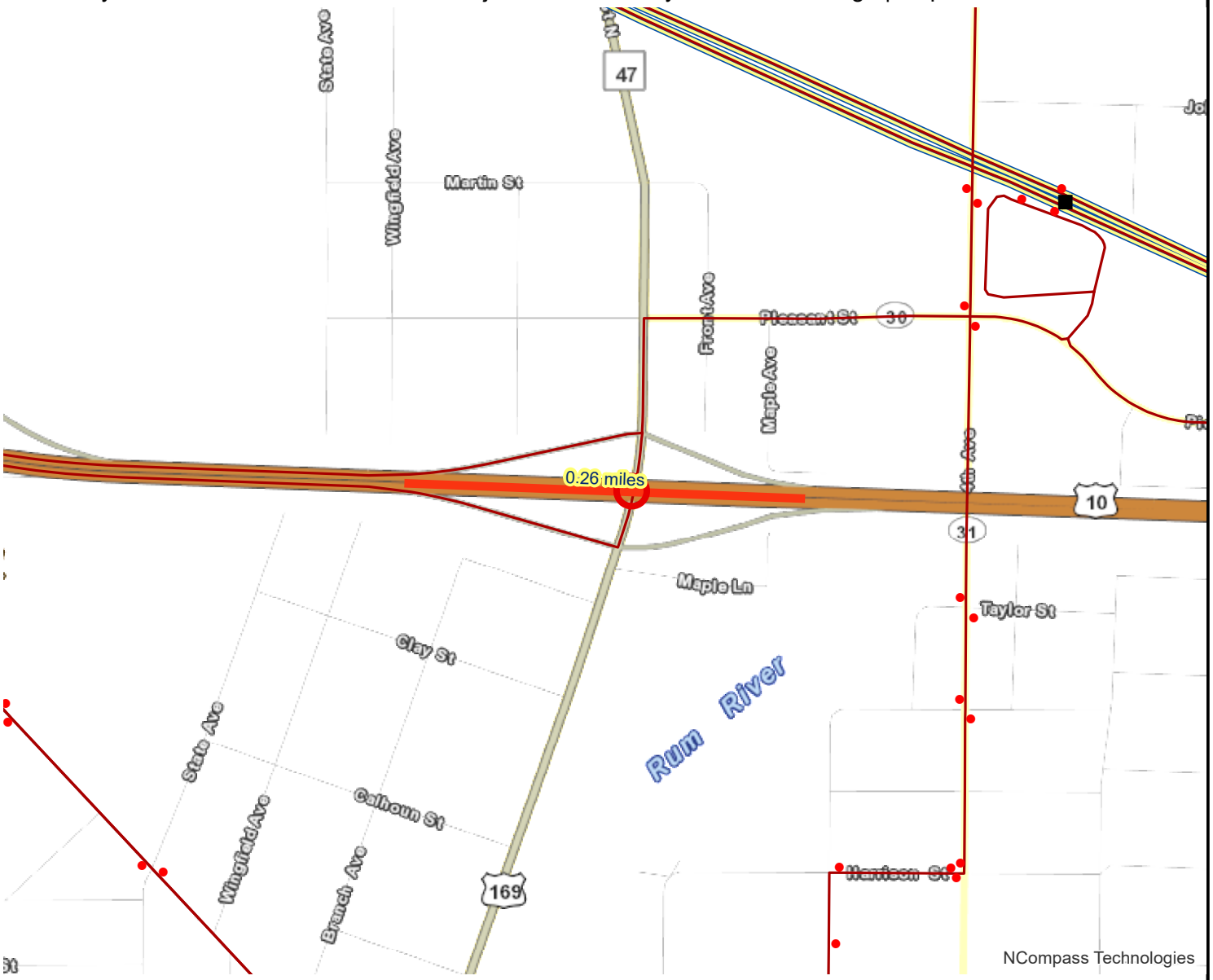
Created: 7/6/2018
LandscapeRSA3

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

METROPOLITAN COUNCIL

Transit Connections

Roadway Reconstruction/Modernization Project: TH 169/Ferry Street Interchange | Map ID: 1531159155527



Results

Transit with a Direct Connection to project:
805 887

**indicates Planned Alignments*

Project Points
Active Stop
Transitway Stations
Transit Routes
Transitway
Project
Northstar Line
Northstar Line

0 0.05 0.1 0.2 0.3 0.4 Miles

Created: 7/9/2018
LandscapeRSA3

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

METROPOLITAN COUNCIL

From:	Corbett, Michael J (DOT)
To:	Mary Gute
Cc:	Mattison, Daniel (DOT); Eric Johnson; Ross Tillman; "Peterson, Steven" (Steven.Peterson@metc.state.mn.us); Fischer, Tony
Subject:	RE: TH 169/MN 47 and TH 10 Interchange Modification, Need to submit interchange request?
Date:	Monday, July 09, 2018 4:39:49 PM

Hello Mary,

We had a chance to review the request and we determined that the Interchange Review Process does not apply to this situation.

According to the Metropolitan Council's 2040 Transportation Policy Plan – Appendix F: Transportation Highway Interchange Request Criteria and Review Procedure, this interchange would fall under the Type A criteria (page F.2). The Type A criteria states:

"New or modified interchanges on existing freeways. These are distinguished by requesting new access to the system where none had previously been provided, or modifying interchanges to provide new movements or wider ramps."

The proposal would change the current diamond interchange to a single point urban interchange. This does not provide any new access, and it does not provide new movements or wider ramps. Therefore, we have determined that the Interchange Review Process does not apply to this situation.

If further design revisions create new access or new movements, the proposal would need to go through the process.

If you have any further questions, please let me know.

Thanks,

Michael Corbett, PE
State Program Administrator Coordinator
MnDOT Metro Division – Planning
1500 W County Road B-2
Roseville, MN 55113
651-234-7793
Michael.J.Corbett@state.mn.us

From: Mary Gute [mailto:marygu@bolton-menk.com]
Sent: Monday, July 9, 2018 4:05 PM

To: Corbett, Michael J (DOT) <michael.j.corbett@state.mn.us>
Cc: Mattison, Daniel (DOT) <dan.mattison@state.mn.us>; Eric Johnson <ericjo@bolton-menk.com>; Ross Tillman <rossti@bolton-menk.com>
Subject: TH 169/MN 47 and TH 10 Interchange Modification, Need to submit interchange request?

Michael, I'm working on a Regional Solicitation application for a MnDOT proposed project to modify the existing interchange at TH 169/MN 47 and TH 10. This is currently a diamond interchange; MnDOT is proposing a single point urban intersection design. A draft concept layout is attached. (Note, the concept is still under development and will chance before submittal for the Regional Solicitation program). Will MnDOT need to go through the highway interchange request process for this interchange modification? Thank you for your feedback.

Mary

Mary Gute, AICP
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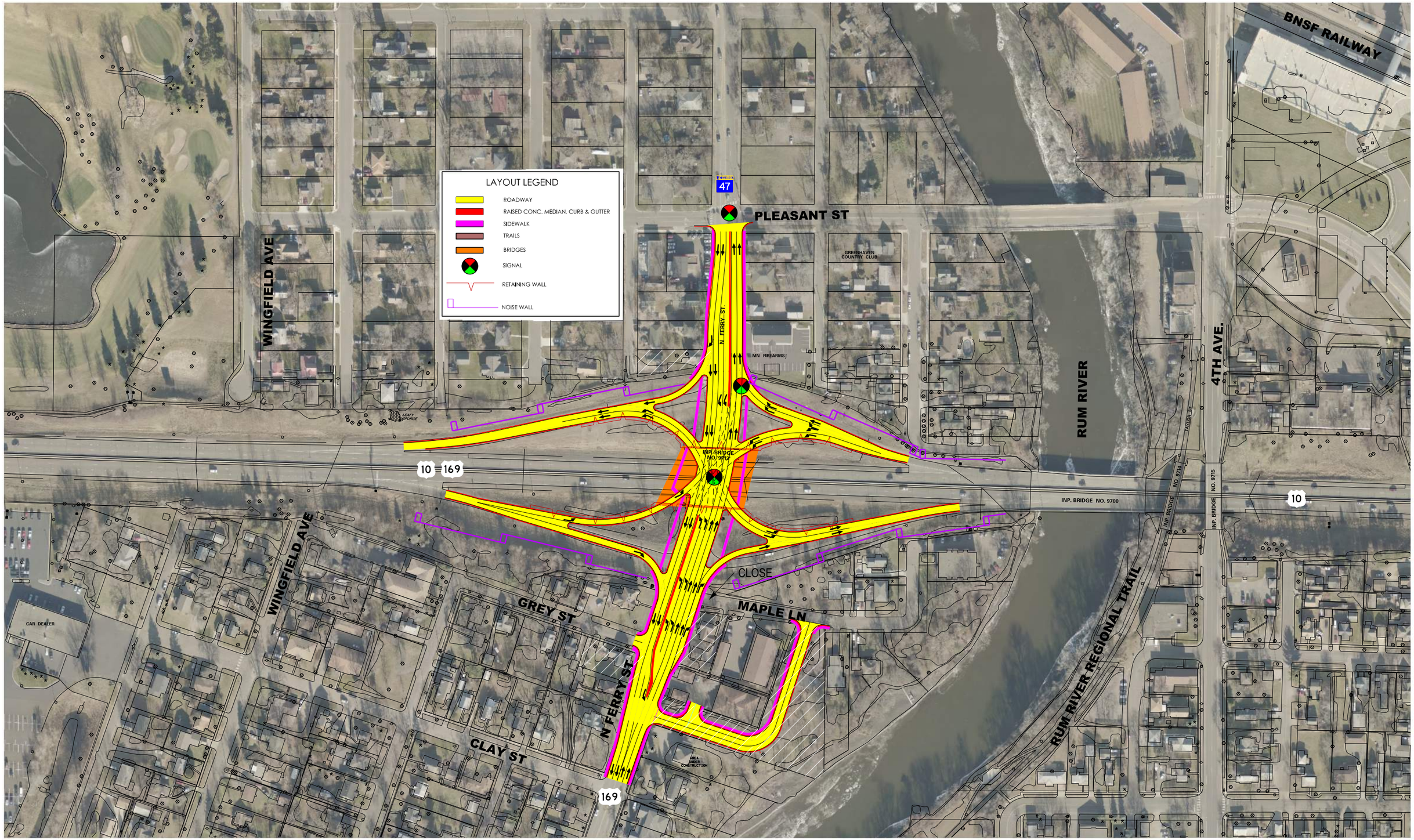

BOLTON & MENK

DEPARTMENT OF TRANSPORTATION

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SCALE FEET

TH169/TH 47 AND TH10 INTERCHANGE PROJECT

DRAFT

JULY 2018
CITY OF ANOKA

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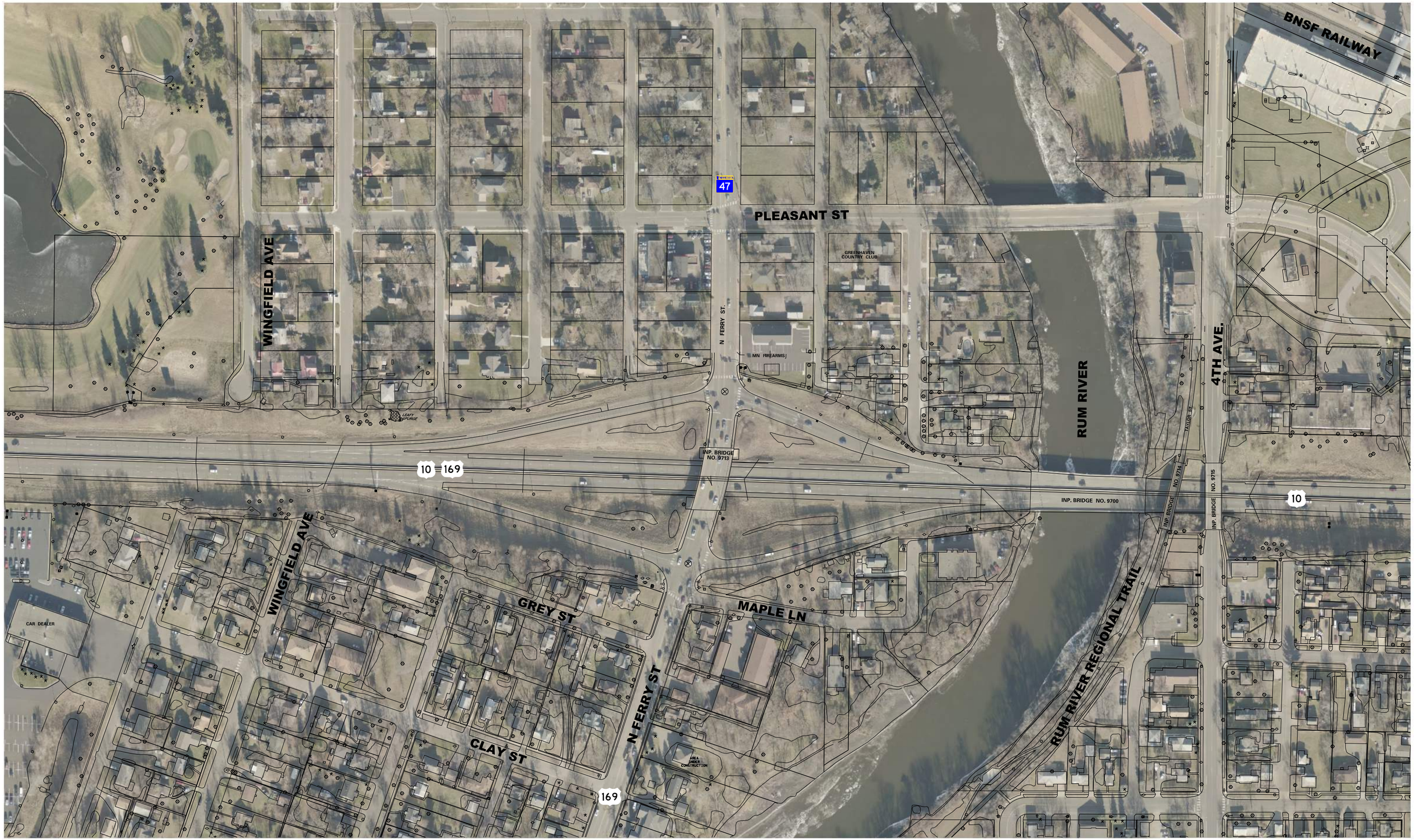

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DEPARTMENT OF TRANSPORTATION

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TH169/TH 47 AND TH10 INTERCHANGE PROJECT

DRAFT

JULY 2018
CITY OF ANOKA

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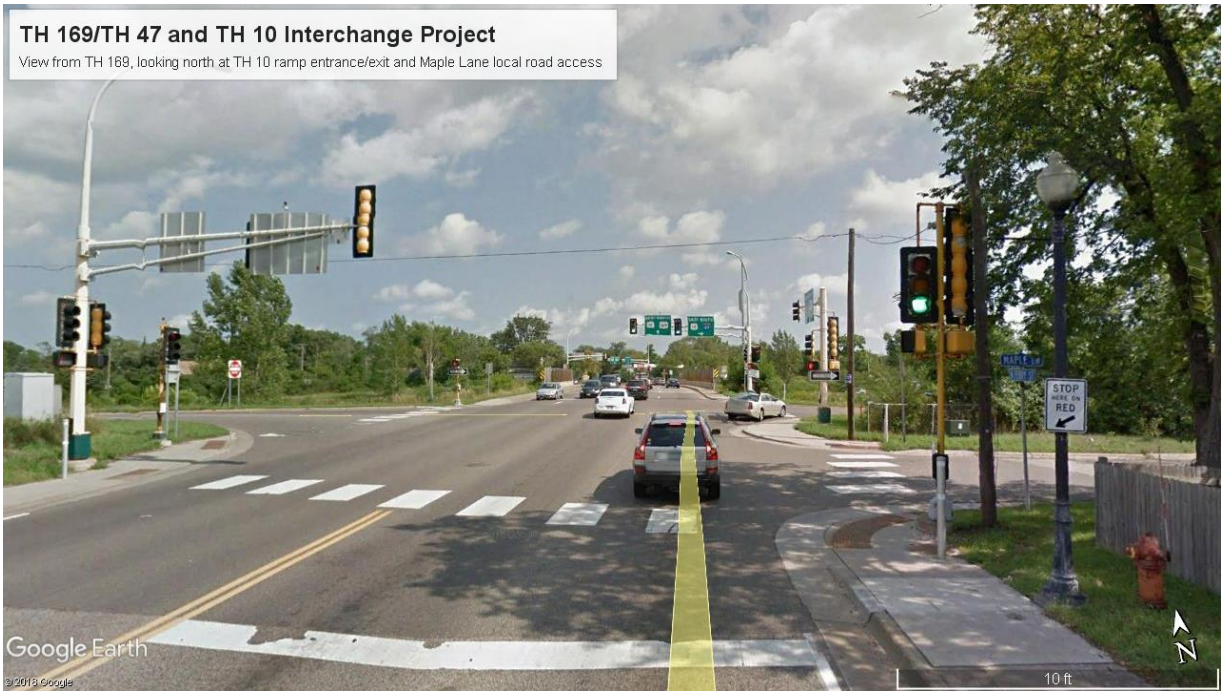
TH 169/TH 47 and TH 10 Interchange Project
View from TH 10 westbound off ramp
EXIT
Google Earth
© 2018 Google
9.47 ft


TH 169/TH 47 and TH 10 Interchange Project
View from TH 47, looking south at TH 10 ramp entrance/exit
Google Earth
© 2018 Google
N
7.06 ft


TH 169/TH 47 and TH 10 Interchange Project
View from TH 169/TH 47 bridge, looking north
Google Earth
© 2018 Google
7.25 ft
N


TH 169/TH 47 and TH 10 Interchange Project
Traffic traveling north on TH 169 waiting at light. Long right lane queue bound for TH 10 East
NORTH
47
SOUTH
169
EAST
10
47
SOUTH
169
Google Earth
© 2018 Google
9.91 ft
N


TH 169/TH 47 and TH 10 Interchange Project
View from TH 169, looking north at TH 10 ramp entrance/exit and Maple Lane local road access
STOP
RED
Google Earth
© 2013 Google
10 ft
N

DEPARTMENT OF TRANSPORTATION

TH 169/TH 47 and TH 10 Interchange Modification Project

Applicant, Location, & Route:

MnDOT applying for funds to modify the interchange at TH 169/TH 47 & TH 10 in the City of Anoka

Application Category:

Roadways including Multimodal Elements – **Roadway Reconstruction/Modernization & Spot Mobility**

Funding Information:

STP Requested Award Amt: $7,000,000
Local Match: $20,100,000
Project Total: $27,100,000

Project Benefits:

- Integrates and extends existing and planned infrastructure
- Improves intersection capacity
- Supports regional commerce through efficient freight movement
- Reduces conflict points and crash potential
- Improves connections to regional destinations
- Promotes non-motorized transportation to areas that provide jobs and services

Project Background

Exit ramps at the TH 169/TH 47/Ferry St and TH 10 interchange are too short to accommodate the maximum queue lengths experienced during morning and afternoon peak hours. Queues frequently extend onto the TH 10 mainline, blocking the lane for through traffic. Left turning traffic at the EB ramp of TH 47 and TH 10 operates at LOS F during the morning peak hour. This interchange underserves traffic demands during peak travel hours which pushes nearly 1,000 vehicles per peak periods onto other routes.

Between 2013 and 2015, there were 68 crashes at the EB TH 10 ramp and TH 47 intersection. Over half of these were rear-end crashes and the majority involved NB vehicles. The crash index at this location is 1.61. Compared to similar intersections statewide, this intersection operates outside the normal range. The crash rate is 2.4 times higher than the statewide average for similar intersections.

Trunk Highways 169 and 10 are both Principal Arterials and TH 47 is an A-Minor Connector. All roads are identified as tiered freight corridors in the Metropolitan Council's Regional Truck Freight Highway Corridor Study (2017). TH 10 is a Tier One corridor, TH 169 is Tier Two, and TH 47 is Tier Three.

WB TH 10 traffic exiting onto NB TH 47 backing up onto TH 10 during PM peak.

Project Description & Benefits

The proposed interchange project will replace the existing diamond interchange with a single point urban interchange (SPUI). This new interchange will enhance traffic operations, increase capacity, and improve roadway safety. The project will improve overall access to this part of Anoka, including the downtown, located less than ½ mile south of the interchange and the City's Northstar Transit Station. The project will also update existing non-motorized transportation facilities by upgrading the existing sidewalk along TH 169/TH 47.

This project is the result of MnDOT's TH 169/TH 47/Ferry St and TH 10 Interchange Improvements Study, the results of which will be published in summer 2018.