Application

13861 - 2020 Roadway Modernization

14396 - TH 47 Corridor Improvements

Regional Solicitation - Roadways Including Multimodal Elements

Status:	Submitted
Submitted Date:	05/15/2020 3:24 PM

Primary Contact

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

Organization Information

Name:	ANOKA, CITY OF

Jurisdictional Agency (if different):	
Organization Type:	City
Organization Website:	www.ci.anoka.mn.us
Address:	2015 1ST AVE N

*	ANOKA	Minnesota	55303
	City	State/Province	Postal Code/Zip

County:	Anoka
Phone:*	763-576-2700 Ext.
Fax:	
PeopleSoft Vendor Number	0000020920A2

Project Information

Project Name	TH 41 Corridor Improvements Project
Primary County where the Project is Located	Anoka
Cities or Townships where the Project is Located:	City of Anoka
Jurisdictional Agency (If Different than the Applicant):	MnDOT

Trunk Highway 47 (St. Francis Blvd) is an A-minor arterial road located in the City of Anoka. It is a heavily traveled (19,000+ ADT) two-lane road, and the segment between the Anoka County Fairgrounds and Bunker Lake Blvd (CSAH 116) experiences a crash rate three times higher than the statewide average. This segment of road includes no turn lanes and 10 public and 31 private access points. The lack of turn lanes coupled with high traffic volumes causes congestion, crashes and unsafe driver behavior (weaving around turning vehicles). At McKinley St, traffic backups behind left-turning vehicles during peak hours are common. Wait times to enter TH 47 from side streets are up to two minutes long. The neighborhood to the east of TH 47 is geographically limited by the Rum River, and TH 47 is the only outlet to move north or south.

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

This project focuses on improving intersection operations and safety, providing a new trail for bicyclists and pedestrians, and providing accommodations for left turning movements to adjacent neighborhoods. The project consists of a new signalized intersection at McKinley St which would provide a reliable access point for residents to turn onto or cross TH 47. Proposed access restrictions at several side streets would encourage use of the new traffic signal. The project includes a center turn lane for TH 47 to provide a safe means for left turns, alleviating prevalent rear-end crashes and vehicle queuing. A new trail for pedestrians and bicyclists alongside TH 47, a new sidewalk on the west side of TH 47 between E Mineral Pond Blvd and Bunker Lake Blvd, and marked crossings at the McKinley St and E Mineral Pond Blvd/Coolidge St NW intersections provide new non-motorized access. This project would convert the existing rural roadway to an urban section and storm sewer will be constructed to provide

adequate drainage conditions. Best management practices for stormwater will be used, as the nearby Rum River and Mississippi River are both listed as impaired.

The project would match into an Anoka County intersection improvement project at Bunker Lake Blvd and TH 47 planned for 2021 construction. That project will include intersection safety improvements, signal optimization, and reconstruction of the existing multi-use trail from Coolidge St to Bunker Lake Blvd. This trail connection would provide local residents with bicycle and pedestrian access to parks along both sides of the Rum River, the Rum River Regional Trail, Anoka Nature Preserve, Anoka County High School, and Rum River Public Library.

(Limit 2,800 characters; approximately 400 words)

TRANSPORTATION IMPROVEMENT PROGRAM (TIP) DESCRIPTION - will be used in TIP if the project is selected for funding. See MnDOT's TIP description guidance.

TH 47, CITY OF ANOKA, FROM 0.1 MI S OF XKIMO ST TO JCT TH 47/CSAH 116, 0.8 MI. SIGNAL, RECONSTRUCT, ADD CTR TURN LN, BIKE PATH, SIDEWALK, ADA, SEWER

Project Length (Miles)

0.8

to the nearest one-tenth of a mile

Project Funding

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

No

If yes, please identify the source(s)

Federal Amount

$4,152,000.00

Match Amount

$1,038,000.00

Minimum of 20% of project total

Project Total

$5,190,000.00

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

Match Percentage

20.0%

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

Source of Match Funds

City of Anoka

A minimum of 20% of the total project cost must come from non-federal sources; additional match funds over the 20% minimum can come from other federal sources

Preferred Program Year

Select one: 2025

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

Additional Program Years:

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

Project Information-Roadways

County, City, or Lead Agency City of Anoka

Functional Class of Road A-Minor Connector

Road System TH

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

Road/Route No. 47

i.e., 53 for CSAH 53

Name of Road St. Francis Blvd

Example; 1st ST., MAIN AVE

Zip Code where Majority of Work is Being Performed 55303

(Approximate) Begin Construction Date 04/01/2024

(Approximate) End Construction Date 11/29/2024

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

From:
(Intersection or Address) Xkimo St

To:
(Intersection or Address) CSAH 116

DO NOT INCLUDE LEGAL DESCRIPTION

Or At

Miles of Sidewalk (nearest 0.1 miles) 0.1

Miles of Trail (nearest 0.1 miles) 0.5

Miles of Trail on the Regional Bicycle Transportation Network (nearest 0.1 miles) 0

Primary Types of Work GRADE, AGG BASE, BIT BASE, BIT SURF, CURB/GUTTER, SIDEWALK, SIGNAL, LIGHTING, BIKE PATH, PED RAMPS, STORM SEWER

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.:

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 (2018), the 2040 Regional Parks Policy Plan (2018), and the 2040 Water Resources Policy Plan (2015).

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

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

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

Goal A: Transportation System Stewardship.

Objective B: Strategically operate the regional transportation system efficiently and cost-effectively.
Strategy A1. (Pp. 2.2-2.4)

Goal B: Safety & Security.
Objective A: Reduce fatal and serious injury crashes and improve safety.
Strategies B1, B2, B3, B4, B6. (Pp. 2.5-2.8).

Goal C: Access to Destinations.

Objective A: Increase multimodal travel options.

Objective B: Increase travel reliability and predictability.

Objective D: Increase number/share of trips using transit, carpools, bicycling and walking. Objective E: Improve availability/quality of multimodal options for all ages and abilities. Strategies C1, C2, C3, C8, C9, C10, C15, C16, C17. (Pp. 2.9-2.24)

Goal D: Competitive Economy.

Objective B: Invest in multimodal transportation system.

Objective C: Support economic competitiveness through efficient freight movement.

Strategies D1, D3, D5. (Pp. 2.26-2.29).

Goal E: Healthy & Equitable Communities.

Objective A: Reduce transportation-related emissions.

Objective C: Increase availability of transit/bicycling/walking.

Objective D: Community cohesion for people of all ages and abilities.

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

Goal F: Leveraging Transportation Investments to Guide Land Use.

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

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

Limit 2,800 characters, approximately 400 words

3.The project or the transportation problem/need that the project addresses must be in a local planning or programming document. Reference the name of the appropriate comprehensive plan, regional/statewide plan, capital improvement program, corridor study document [studies on trunk highway must be approved by the Minnesota Department of Transportation and the Metropolitan Council], or other official plan or program of the applicant agency [includes Safe Routes to School Plans] that the project is included in and/or a transportation problem/need that the project addresses.

Anoka 2040 Comprehensive Plan

Figure T-2: Existing Traffic Volumes shows that TH 47 is at/over capacity (operating at level of service E and F). (P. 197)

Identifies a problem and issue location for TH 47 between Garfield Avenue and the intersection with Bunker Lake Blvd (CSAH 116). This encompasses the project area. (P. 204)

References a 2017-2018 study of TH 47 examining safety, mobility, and access concerns along the project corridor. This identified access issues, pedestrian and non-motorized traffic access, and the overall configuration of TH 47 and local street intersections. (P. 206)

List the applicable documents and pages:

The plan indicates that recommendations for this segment of TH 47 are anticipated to be implemented by 2040. (P. 208)

The plan?s transportation safety analysis references the TH 47 project segment, again indicating that the city will advance improvements on TH 47 to from the BNSF rail line to the northern city border. (P. 218)

Limit 2,800 characters, approximately 400 words

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

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

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

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

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

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

7.The requested funding amount must be more than or equal to the minimum award and less than or equal to the maximum award. The cost of preparing a project for funding authorization can be substantial. For that reason, minimum federal amounts apply. Other federal funds may be combined with the requested funds for projects exceeding the maximum award, but the source(s) must be identified in the application. Funding amounts by application category are listed below.
Strategic Capacity (Roadway Expansion): *$1,000,000 to $10,000,000*
Roadway Reconstruction/Modernization: *$1,000,000 to $7,000,000*
Traffic Management Technologies (Roadway System Management): *$250,000 to $3,500,000*
Spot Mobility and Safety: *$1,000,000 to $3,500,000*
Bridges Rehabilitation/Replacement: *$1,000,000 to $7,000,000*

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

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

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

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

The applicant is a public agency that employs 50 or more people and has a completed ADA transition plan that covers the public right of way/transportation.	Yes
Date plan completed:	12/02/2019
Link to plan:	https://www.anokaminnesota.com/DocumentCenter/View/1189/ADA-Transition-Plan-PDF

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

Date self-evaluation completed:

Link to plan:

Upload plan or self-evaluation if there is no link

Upload as PDF

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

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

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

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

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

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

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

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

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

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

Roadways Including Multimodal Elements

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

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

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

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

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

Bridge Rehabilitation/Replacement and Strategic Capacity projects only:

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

4.The bridge must carry vehicular traffic. Bridges can carry traffic from multiple modes. However, bridges that are exclusively for bicycle or pedestrian traffic must apply under one of the Bicycle and Pedestrian Facilities application categories. Rail-only bridges are ineligible for funding.

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

Bridge Rehabilitation/Replacement projects only:

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

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

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

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

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

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

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

Requirements - Roadways Including Multimodal Elements

Specific Roadway Elements

CONSTRUCTION PROJECT ELEMENTS/COST ESTIMATES	Cost

Mobilization (approx. 5% of total cost)	$250,000.00
Removals (approx. 5% of total cost)	$260,000.00
Roadway (grading, borrow, etc.)	$285,000.00
Roadway (aggregates and paving)	$1,285,000.00
Subgrade Correction (muck)	$0.00
Storm Sewer	$800,000.00
Ponds	$500,000.00
Concrete Items (curb & gutter, sidewalks, median barriers)	$335,000.00
Traffic Control	$250,000.00
Striping	$35,000.00
Signing	$35,000.00
Lighting	$50,000.00
Turf - Erosion & Landscaping	$170,000.00
Bridge	$0.00
Retaining Walls	$0.00
Noise Wall (not calculated in cost effectiveness measure)	$0.00
Traffic Signals	$250,000.00
Wetland Mitigation	$0.00
Other Natural and Cultural Resource Protection	$0.00
RR Crossing	$0.00
Roadway Contingencies	$400,000.00
Other Roadway Elements	$100,000.00
Totals	**$5,005,000.00**

Specific Bicycle and Pedestrian Elements

CONSTRUCTION PROJECT ELEMENTS/COST ESTIMATES	**Cost**
Path/Trail Construction	$55,000.00
Sidewalk Construction	$35,000.00
On-Street Bicycle Facility Construction	$0.00
Right-of-Way	$0.00
Pedestrian Curb Ramps (ADA)	$35,000.00
Crossing Aids (e.g., Audible Pedestrian Signals, HAWK)	$0.00
Pedestrian-scale Lighting	$0.00
Streetscaping	$0.00

Wayfinding	$0.00
Bicycle and Pedestrian Contingencies	$60,000.00
Other Bicycle and Pedestrian Elements	$0.00
Totals	**$185,000.00**

Specific Transit and TDM Elements

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

Transit Operating Costs

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

Totals

Total Cost	$5,190,000.00
Construction Cost Total	$5,190,000.00
Transit Operating Cost Total	$0.00

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

Existing Employment within 1 Mile:	11130
Existing Manufacturing/Distribution-Related Employment within 1 Mile:	1842

Existing Post-Secondary Students within 1 Mile:	0
Upload Map	1589559336260_TH47_RegionalEconomy.pdf

Please upload attachment in PDF form.

Measure C: Current Heavy Commercial Traffic

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

Along Tier 1:	
Miles:	0

(to the nearest 0.1 miles)

Along Tier 2:	
Miles:	0

(to the nearest 0.1 miles)

Along Tier 3:	Yes
Miles:	0.8

(to the nearest 0.1 miles)

The project provides a direct and immediate connection (i.e., intersects) with either a Tier 1, Tier 2, or Tier 3 corridor:	
None of the tiers:	

Measure A: Current Daily Person Throughput

Location	TH 47 on south side of Anoka County Fairgrounds
Current AADT Volume	18500
Existing Transit Routes on the Project	N/A

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

Upload Transit Connections Map	1589559667950_TH47_TransitConnections.pdf

Please upload attachment in PDF form.

Response: Current Daily Person Throughput

Average Annual Daily Transit Ridership	0
Current Daily Person Throughput	24050.0

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	Anoka County Model
Forecast (2040) ADT volume	21300

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

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

The census tracts surrounding the project all have above average concentrations of poverty, so neighborhood outreach can be understood to work directly with an equity population. The City of Anoka advanced the TH 47 Corridor Project in 2017, following earlier neighborhood engagement from MnDOT's study of grade separation over the BNSF rail tracks just south of the project area. Residents related their individual perspectives on TH 47 about how they wanted to get in and out of the neighborhood and tracing the routes they use and the access and safety issues along the highway. This project is about community connectivity and safety so that this neighborhood can have safe and reliable access and multimodal travel options.

Response:

An open house was held in February 2020 with over 60 attendees. A project-specific website was established and maintained (https://clients.bolton-menk.com/anokahwy47/), including information on project location, keyissues, relationship to nearby projects, draft project layout, and an animation of the future corridor. There are plans for further engagement with affected property owners and corridor users.

Concurrently, Anoka County held a public information meeting on November 5, 2019 for the Bunker Lake Boulevard (CSAH 116) and TH 47 intersection improvements project. This Anoka County project would tie into the TH 47 corridor project at Coolidge St NW and would include signal and lane improvements at the intersection, as well as reconstructed multi-use trails.

In 2016, MnDOT published the Railroad Separation at Highway 47 Feasibility Study, recommending

grade separation for TH 47 over the BNSF railway tracks south of the Anoka County Fairgrounds. A public open house was held in June 2016, attracting approximately 124 people, many of whom shared concerns about this section of TH 47 ? ultimately leading to the TH 47 Corridor Improvements Project.

(Limit 2,800 characters; approximately 400 words)

*2.**Sub-measure**: Equity Population Benefits and Impacts: A successful project is one that has been designed to provide direct benefits to low-income populations, people of color, persons with disabilities, youth and the elderly. All projects must mitigate potential negative benefits as required under federal law. Projects that are designed to provide benefits go beyond the mitigation requirement to proactively provide transportation benefits and solve transportation issues experienced by Equity populations.*
a.Describe the projects benefits to low-income populations, people of color, children, people with disabilities, and the elderly. Benefits could relate to pedestrian and bicycle safety improvements; public health benefits; direct access improvements for residents or improved access to destinations such as jobs, school, health care or other; travel time improvements; gap closures; new transportation services or modal options, leveraging of other beneficial projects and investments; and/or community connection and cohesion improvements. Note that this is not an exhaustive list.

This project includes a new, ADA-compliant multi-use trail along TH 47 from Coolidge St NW to the Anoka County Fairgrounds. It would link to a programmed (2021) intersection improvement at TH 47 and Bunker Lake Blvd (CSAH 116) that would reconstruct a shared use path from Bunker Lake Blvd south to Coolidge St NW. This, in turn, links to existing paths within Rivers? Bend Park in Ramsey, MN, and would connect to the CSAH 116 bridge over the Rum River to join the Anoka Rum River Regional Trail and to provide a direct, non-motorized linkage to the Anoka Nature Reserve, Anoka High School and Rum River Public Library. The project also includes a new sidewalk segment on the westerns side of TH 47 between E Mineral Pond Blvd and CSAH 116.

Response:

The neighborhoods adjacent to TH 47 in Anoka have not up to this point had sidewalks or a trail facility to access Bunker Lake Blvd and the park and trail resources adjacent to the Rum River. In addition to the beneficial connections from the CSAH 116 linkage and crossing of the Rum River, this project would allow a connection to Rum River South County Park and paths through the Anoka County Fairgrounds site. The multi-use trail along TH 47 will link to an existing sidewalk and bikeway at McKinley St (new traffic signal), allowing neighborhoods east of TH 47 non-motorized access to George Enloe Park and the Anoka Enterprise Park ? a major business/industrial park and employment center.

The establishment of a new trail, sidewalk and new linkages will improve bicycle and pedestrian safety (by no longer having individuals walk or bicycle on the roadway and narrow shoulders), public health (both through active recreation opportunities and access to parks and other public services), direct

access to a large, regional high school; and provision of modal alternatives to access parks, a school and a public library.

(Limit 2,800 characters; approximately 400 words)

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

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

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

Increased noise.

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

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

Increased speed and/or cut-through traffic.

Removed or diminished safe bicycle access.

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

Displacement of residents and businesses.

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

Other

This project will result in a new multi-use trail along the east side of TH 47, a new sidewalk south from CSAH 116, a three-lane configuration intended to decrease vehicle delay, decrease crashes and more safely accommodate left turns for local residents, the closure of two neighborhood streets (McCann Ave and Dunham Dr) at TH 47, and the addition of a raised concrete median to prevent all left turns at E. Mineral Pond Blvd/Coolidge St NW and TH 47 due to proximity to CSAH 116.

The closure of neighborhood streets and left turn movements at E Mineral Pond Blvd/Coolidge St NW would decrease some vehicular access possibilities for all local residents, and are not specific to any particular populations.

Response:

Access at the two closed neighborhood streets would be mitigated through the installation of a traffic signal at McKinley St (which would be the only signalized intersection along the project corridor). Neighborhood residents on both sides of TH 47 who currently have unreliable access to TH 47 will be able to use the McKinley St signal and will now have a realiable access point to the highway and community. Access to the new trail along TH 47 will be provided from both McCann Ave and Durham Dr. The new trail will provide an additional transportation option that is not available today.

Preventing left turns at E. Mineral Pond Blvd/Coolidge St NW would be mitigated by the installation of a traffic signal at McKinley St, and by the provision of a new crosswalk with a pedestrian median refuge to allow access to and from the new shared use path along TH 47.

The roadway will generally be widened to accommodate a center turn lane. This has safety benefits for the corridor ? most notably reduction in rear end crashes ? but the wider road cross section also means a longer crossing distance for pedestrians. This would be mitigated with new pedestrian traffic signal infrastructure and properly timed pedestrian phasing at McKinley St and a marked pedestrian crossing with a median refuge at Coolidge St NW.

(Limit 2,800 characters; approximately 400 words)

Select one:

*3.**Sub-measure: Bonus Points** Those projects that score at least 80% of the maximum total points available through sub-measures 1 and 2 will be awarded bonus points based on the geographic location of the project. These points will be assigned as follows, based on the highest-scoring geography the project contacts:*
a.25 points to projects within an Area of Concentrated Poverty with 50% or more people of color
b.20 points to projects within an Area of Concentrated Poverty
c.15 points to projects within census tracts with the percent of population in poverty or population of color above the regional average percent
d.10 points for all other areas

Project is located in an Area of Concentrated Poverty where 50% or more of residents are people of color (ACP50):	
Project located in Area of Concentrated Poverty:	
Projects census tracts are above the regional average for population in poverty or population of color:	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)

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

Upload Map	1589561997420_TH47_SocioEconomic.pdf

Measure B: Part 1: Housing Performance Score

City	Segment Length (For stand-alone projects, enter population from Regional Economy map) within each City/Township	Segment Length/Total Project Length	Score	Housing Score Multiplied by Segment percent
Anoka	0.8	1.0	79.0	79.0

Total Project Length

Total Project Length	0.8

Project length entered on the Project Information - General form.

Housing Performance Score

Total Project Length (Miles) or Population	0.8
Total Housing Score	79.0

Affordable Housing Scoring

Part 2: Affordable Housing Access

Reference Access to Affordable Housing Guidance located under Regional Solicitation Resources for information on how to respond to this measure and create the map.
If text box is not showing, click Edit or "Add" in top right of page.

Anoka, MN Affordable Housing Units Citywide

Properties: 11

Total Units: 661

30% AMI: 226

50% AMI: 81

60% AMI: 279

80% AMI: 0

Total Affordable Units: 586

Response:

There are no existing affordable housing units within ½ mile of the proposed project. The City of Anoka Comprehensive Plan notes that Anoka's housing stock is affordable - more affordable than Anoka County and the 7-county metropolitan area. The Comp Plan demonstrates that, as of 2015, 6,968 housing units in Anoka were affordable at 80% Area Median Income (AMI) or below. This is almost 93% of available housing in Anoka as of 2015.

The Met Council's 2015 System Statement requires that the City of Anoka plan for an additional 113 affordable housing units over the next 20 years (58 at 30% AMI, 55 at 51 to 80% AMI). Anoka's land use designation for High Density Residential and the available acreage in that land use category would fulfill the Met Council's affordable housing allocation requirements.

There is a prevalence of housing on the lower end of the homesteaded market value spectrum along

TH 47 in the Project Area. The American Community Survey estimated median home value in Anoka in 2015 was $164,700, and many properties along TH 47 ranged from $100,001 to $175,000 based on 2017 MetroGIS data. Houses tend to be small in terms of finished square feet (mostly 751 to 1,100 square feet) which lends itself to affordability.

This project will improve access for vehicles, pedestrians and bicyclists. Pedestrians will be able to use the traffic signal and designated pedestrian crossing at McKinley St, as well as a new crosswalk with pedestrian refuge island at E Mineral Pond Blvd/Coolidge St NW. Both bicyclists and pedestrians will enjoy enhanced access with the completion of a shared use path alongside TH 47 from the Anoka County Fairgrounds to Bunker Lake Blvd. This new path will facilitate access to public parks and trails, Anoka High School and Rum River Public Library. For vehicles, the introduction of a new traffic signal at McKinley St will facilitate turning onto TH 47.

(Limit 2,100 characters; approximately 300 words)

Upload map: 1589562918893_TH47_Affordable_Hsg_Map.pdf

Measure A: Year of Roadway Construction

Year of Original Roadway Construction or Most Recent Reconstruction	Segment Length	Calculation	Calculation 2
1934	0.8	1547.2	1934.0
	1	**1547**	**1934**

Total Project Length

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

Average Construction Year

Weighted Year 1934

Total Segment Length (Miles)

Total Segment Length 0.8

Measure B: Geometric, Structural, or Infrastructure Improvements

Improved roadway to better accommodate freight movements: Yes

Response:

McKinley St provides a primary east-west connection to Anoka Enterprise Park, an industrial park located just west of the TH 47 corridor. The traffic signal installed at McKinley St, along with the left turn lane access at this location, will provide enhanced access to the industrial park area for freight vehicles. Freight haulers will benefit from improved fuel economy with reduced delay as well as decreased and more reliable travel times.

(Limit 700 characters; approximately 100 words)

Improved clear zones or sight lines: Yes

Response:

There are numerous existing trees currently within the clear zone for TH 47 (17 feet for a tangent section with a 45 MPH design speed and more than 6,000 vehicles per day). This project will provide new curb and additional space between the lane line and trees, resulting in improved sight lines and safety benefits.

(Limit 700 characters; approximately 100 words)

Improved roadway geometrics: Yes

The project will include the provision of a center turning lane. More than 50% of crashes along this section of TH 47 have been rear end crashes, many associated with left turning vehicles. The left turn lane will provide much safer space for vehicles to successfully wait and make left turns.

Response:

Turn lanes will be included at strategic locations to improve vehicle delay and increase safety. This includes McKinley St, Wilson St and E Mineral Pond Blvd/Coolidge St NW.

(Limit 700 characters; approximately 100 words)

Access management enhancements:

Yes

Side streets will be closed at McCann Ave and Dunham Dr. Traffic will be routed to a traffic signal at McKinley St, which will improve turning onto TH 47. Bicyclists and pedestrians can access a new north-south shared use path alongside TH 47 from the closed side streets and from three other intersections.

Response:

A center median at E Mineral Pond Blvd/Coolidge St NW. will prevent left turning and side street traffic from traveling through the intersection. This will improve movement and prevent conflicts, especially as queues from Bunker Lake Blvd can extend through this intersection. The median will include a pedestrian refuge and new marked crosswalks / ADA-compliant curb ramps.

(Limit 700 characters; approximately 100 words)

Vertical/horizontal alignment improvements:

Yes

Current roadway alignments appear to be appropriate for the posted speed of 45 MPH. The project will utilize a lower design speed and adjustments to profile and horizontal alignment will be made accordingly to manage speeds by design.

Response:

(Limit 700 characters; approximately 100 words)

Improved stormwater mitigation: Yes

Response:

The TH 47 improvements will convert the existing rural roadway to an urban section requiring storm sewer to provide adequate drainage conditions. The limited available right of way will require innovative stormwater best management practices to ensure compliance. A pond option is shown on the project layout to improve mitigation, however additional or alternative measures will be considered in design. The project is in close proximity to the Rum River and Mississippi River which are both listed as impaired per the MPCA?s 2018 list of impaired waterways.

(Limit 700 characters; approximately 100 words)

Signals/lighting upgrades: Yes

Response:

The project includes the installation of a new, actuated traffic signal at McKinley St. Paired with the access management, this intersection will provide reliable access to Hwy 47 for residents along the corridor. McKinley St also provides a connection to the industrial park to the west and can serve as an additional access for those businesses connecting to the trunk highway system. The signal will include pedestrian APS push buttons, LED signal indications, LED overhead lighting, and countdown timers.

The project will install improved intersection lighting at key intersections to provide illumination of conflict zones and pedestrian crossings along the corridor.

(Limit 700 characters; approximately 100 words)

Other Improvements Yes

Response:

This project features a multi-use trail along the east side of TH 47 from the Anoka County Fairgrounds north to Coolidge St NW, where it will match into an Anoka County intersection improvement project at TH 47/CSAH 116 (programmed 2021). This new trail will provide dedicated bicycle and pedestrian access through the neighborhood, while also linking up to the larger regional trail system, a crossing of the Rum River, and to local public destinations including parks, Anoka High School, and the Rum River Library.

(Limit 700 characters; approximately 100 words)

Measure A: Congestion Reduction/Air Quality

Total Peak Hour Delay Per Vehicle Without The Project (Seconds/ Vehicle)	Total Peak Hour Delay Per Vehicle With The Project (Seconds/ Vehicle)	Total Peak Hour Delay Per Vehicle Reduced by Project (Seconds/ Vehicle)	Volume without the Project (Vehicles per hour)	Volume with the Project (Vehicles Per Hour):	Total Peak Hour Delay Reduced by the Project:	Total Peak Hour Delay Reduced by the Project:	EXPLANATION of methodology used to calculate railroad crossing delay, if applicable.	Synchro or HCM Reports

4.0	4.0	0	2029	2029	0	0	While a decrease in overall delay per vehicle is not shown with this project, it should be recognized that the side street delay is currently problematic and will be improved with the addition of a signal at McKinley St. The westbound approach delay at McKinley St is over two minutes per vehicle without the project. By adding a signal, the delay is reduced to 25 seconds per vehicle with the project. The delay before and after the project ended up being the same because the higher volume TH	1589564846681_TH47_Synchro.pdf

47 traffic has the right of way under the existing conditions but may need to stop with a signal so their delay is slightly increasing while the side street delay greatly decreases, but has a lower volume. Since the volume is lower on the side streets the side street delay does not have as great of an impact on the overall delay because the delay is calculating the average wait time per all vehicles in the network. Another item to consider is that there are several driveways throughout

the project area that have direct access onto TH 47. These driveways were not included in the traffic model, but with the addition of a center turn lane, vehicles would no longer back up along TH 47 while waiting for a safe gap in traffic. This is delay under the existing roadway network that was not captured in the model but would be improved.

7.0	7.0	0	2029	2029	0	0	While a decrease in overall delay per vehicle is not shown with this project, it should be recognized that the side street delay is currently problematic and will be improved with the addition of a signal at McKinley St. The westbound approach delay at McKinley St is over two minutes per vehicle without the project. By adding a signal, the delay is reduced to 25 seconds per vehicle with the project. The delay before and after the project ended up being the same because the higher volume TH	1589573160467_TH47_Synchro.pdf

47 traffic has the right of way under the existing conditions but may need to stop with a signal so their delay is slightly increasing while the side street delay greatly decreases, but has a lower volume. Since the volume is lower on the side streets the side street delay does not have as great of an impact on the overall delay because the delay is calculating the average wait time per all vehicles in the network. Another item to consider is that there are several driveways throughout

	the project area that have direct access onto TH 47. These driveways were not included in the traffic model, but with the addition of a center turn lane, vehicles would no longer back up along TH 47 while waiting for a safe gap in traffic. This is delay under the existing roadway network that was not captured in the model but would be improved.	
		0

Vehicle Delay Reduced

Total Peak Hour Delay Reduced	0
Total Peak Hour Delay Reduced	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):
6.72	5.36	1.36
7	**5**	**1**

Total

Total Emissions Reduced:	1.36
Upload Synchro Report	1589565077448_TH47_Synchro.pdf

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

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

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

Total Parallel Roadway

Emissions Reduced on Parallel Roadways	0
Upload Synchro Report	

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

New Roadway Portion:

Cruise speed in miles per hour with the project:	0
Vehicle miles traveled with the project:	0
Total delay in hours with the project:	0
Total stops in vehicles per hour with the project:	0
Fuel consumption in gallons:	0
Total (CO, NOX, and VOC) Peak Hour Emissions Reduced or Produced on New Roadway (Kilograms):	0
EXPLANATION of methodology and assumptions used:(Limit 1,400 characters; approximately 200 words)	
Total (CO, NOX, and VOC) Peak Hour Emissions Reduced by the Project (Kilograms):	0.0

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

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

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

Crash Modification Factor Used:

CMF ID: 2351; Install TWLTL (two-way left turn lane) on two lane road

Crash modification factor: 0.613 (38.7% reduction)

CMF ID: 326; Install a traffic signal

Crash modification factor: 0.23 (77% reduction)

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

Crash modification factor: 0.55 (45% reduction)

CMF ID: 2338; Install TWLTL (two-way left turn lane) on two lane road

Crash modification factor: 0.686 (31.4% reduction)

(Limit 700 Characters; approximately 100 words)

Rationale for Crash Modification Selected:

CMF ID: 2351 - Install TWLTL (two-way left turn lane) on two lane road. This CMF was selected as most of the crashes along the corridor (27 of the 39) were rear end crashes. This CMF estimates the reduction in rear end crashes with the installation of a center turn lane along the corridor and was applied to the 27 rear end crashes.

CMF ID: 326 - Install a traffic signal. This CMF was selected to determine the reduction in angle crashes at the intersection of TH 47 and McKinley St with the installation of a signal. There were two right angle crashes this CMF was applied to.

CMF ID: 9821 - Install right-in/right-out (RIRO) operations at stop-controlled intersections. This CMF was selected to determine the reduction in crashes at the intersection of TH 47 and Coolidge St NW with the installation of a RIRO. This CMF was applied to the one crash. There were three crashes between 2016 and 2018 that occurred at this intersection, however two were rear end crashes. The rear end crashes were reduced with CMF 2351, so they were not included in this crash reduction.

CMF ID: 2338 - Install TWLTL (two-way left turn lane) on two lane road. This CMF was selected to estimates the reduction in all other crashes along the corridor with the installation of a center turn lane. This CMF was applied to the nine remaining crashes along the corridor.

(Limit 1400 Characters; approximately 200 words)

Project Benefit ($) from B/C Ratio	$3,070,606.00
Total Fatal (K) Crashes:	0
Total Serious Injury (A) Crashes:	0
Total Non-Motorized Fatal and Serious Injury Crashes:	0

Total Crashes:	39
Total Fatal (K) Crashes Reduced by Project:	0
Total Serious Injury (A) Crashes Reduced by Project:	0
Total Non-Motorized Fatal and Serious Injury Crashes Reduced by Project:	0
Total Crashes Reduced by Project:	15
Worksheet Attachment	1589565580898_TH47_Safety Attachments_All.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

The project includes a new multi-use trail from the Anoka County Fairgrounds alongside TH 47 north to E Mineral Pond Blvd/Coolidge St NW, where it ties into an existing (to be reconstructed in 2021) trail south from Bunker Hill Rd. This linkage provides access to the Anoka County Fairgrounds, to parks and regional paths along the Rum River, access via Bunker Hill Rd to the Anoka Nature Reserve, Anoka High School and to the Rum River Public Library. The new trail will provide north-south access for pedestrians adjacent to the project area along TH 47 where no sidewalk or path existed previously. People walking along TH 47 to this point have to walk in the road or along a narrow (2-3?) shoulder or in grassy areas. The project also includes a new section of sidewalk on the west side of TH 47 between E Mineral Pond Blvd and CSAH 116. The sidewalk and trail will provide access to the small commercial node at the TH 47/CSAH 116 intersection.

Response:

The project includes a new signalized intersection at McKinley St. This is a currently side street stop controlled, and the intersection lacks crosswalks and ADA-compliant curb ramps. The new signal will provide ADA-compliant ramps at all corners of the intersection, crosswalks on all legs and accessible pedestrian signals, including audible locator tones and crossing messages, pedestrian countdown timers, and enhanced lighting. This crosswalk will provide access to the new TH 47 trail for neighborhoods west of TH 47, and will provide walking access to George Enloe Park for neighborhoods east of TH 47.

The project includes a new marked crosswalk at E Mineral Pond Blvd/Coolidge St NW, which will include a median refuge island. This provides access to the new shared use path from

neighborhoods west of TH 47.

(Limit 2,800 characters; approximately 400 words)

Measure A: Multimodal Elements and Existing Connections

This project includes a new traffic signal at TH 47 and McKinley St (ADA curb ramps, APS features and enhanced lighting). It includes a new marked pedestrian crossing with a median refuge at TH 47 and E Mineral Pond Blvd/Coolidge St NW. The project includes a new multi-use trail along TH 47 extending from the Anoka County Fairgrounds north to Coolidge St NW, where it matches into a trail to be reconstructed in 2021 as part of an Anoka County intersection project. The project includes a new section of sidewalk on the west side of TH 47 from E Mineral Pond Rd to CSAH 116, providing access to the commercial node at the TH 47/CSAH 116 intersection.

Response:

These crosswalks and trails will greatly improve safety for bicyclists and pedestrians traveling along and across TH 47, which is characterized by heavy traffic and no designated crossings. No parallel trails or sidewalks presently exist. New crossings will greatly improve visibility and overall pedestrian and bicycle safety. Likewise, the trail along TH 47 provides a space for bicyclists and pedestrians to travel along the road. Today, people walking and biking must do so in the road or on a narrow shoulder (2-3?) or in grassy areas.

The new bike/ped features become part of a larger network. The trail links to the Anoka County Fairgrounds , and thereby to Rum River South County Park. It links to a north to CSAH 116, and then across the Rum River, connecting to Rivers? Bend Park, Anoka County High School, Anoka Nature Reserve, Rum River Public Library and to the Anoka Rum River Regional Trail (RBTN Tier 2 Alignment). Designated TH 47 crossings provide access via existing sidewalks to neighborhoods west of TH 47, to George Enloe Park and to Anoka Enterprise Park ? a major area employment center.

McKinley St is a designated bike route. To the west, McKinley St has wide painted shoulders and prohibiting parking, functioning as bike lanes. To the east, it is a neighborhood road, with direct connections to Rum River South County Park.

The Main Street and US-10 corridor south of the Project Area is designated an RBTN Tier 1 corridor. The TH 47 Corridor Improvements Project would extend a trail to the Anoka County Fairgrounds. The advancement of MnDOT?s BNSF railroad grade separation project south of the fairgrounds would likely include additional bike/ped accommodation and could potentially link to the TH 47 trail.

The Met Council?s defines Regional Bicycle Barriers as freeways/expressways, railroads and streams. Nearby, these would include US-10, the BNSF railway corridor and the Rum and Mississippi Rivers. The TH 47 Project would not directly overcome any Regional Bicycle Barriers, however the it links to an existing crossing of the Rum River and would facilitate a future link over the BNSF rail tracks.

(Limit 2,800 characters; approximately 400 words)

Transit Projects Not Requiring Construction

If the applicant is completing a transit application that is operations only, check the box and do not complete the remainder of the form. These projects will receive full points for the Risk Assessment.
Park-and-Ride and other transit construction projects require completion of the Risk Assessment below.

Check Here if Your Transit Project Does Not Require Construction

Measure A: Risk Assessment - Construction Projects

1)Layout (25 Percent of Points)

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

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

100%

Attach Layout 1589566190325_TH47_Layout_FINAL.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 06/01/2021

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

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

100%

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

100%

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

80%

Historic/archeological property impacted; determination of adverse effect anticipated

40%

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

0%

Project is located on an identified historic bridge

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

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

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 Yes

25%

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

0%

Anticipated date or date of acquisition 01/02/2023

4)Railroad Involvement (15 Percent of Points)

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

100%

Signature Page

Please upload attachment in PDF form.

Railroad Right-of-Way Agreement required; negotiations have begun

50%

Railroad Right-of-Way Agreement required; negotiations have not begun.

0%

Anticipated date or date of executed Agreement

5) Public Involvement (20 percent of points)

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

Meeting with general public: 02/20/2020

Meeting with partner agencies: 12/18/2019

Targeted online/mail outreach: 02/04/2020

Number of respondents: 624

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

100%

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

75%

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

50%

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

50%

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

25%

No outreach has led to the selection of this project.

0%

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

The genesis for this project came from public engagement for the Railroad Separation at Highway 47 Feasibility Study. This study investigated the feasibility of a grade separation for the busy BNSF rail tracks just south of the Anoka County Fairgrounds, where TH 47 (Ferry St) crosses at grade. In addition to commentary about the railroad crossing, many people commented at public open houses in June 2016 and February 2017 about safety and traffic conditions on TH 47 further north. The City of Anoka heeded this information and the TH 47 (St. Francis Blvd) Corridor Improvements Project was created.

This project has included meetings with MnDOT staff, with Anoka City Council, and many project management team meetings with City of Anoka staff. Multiple meetings were held with MnDOT regarding this project (3/17, 8/17, 10/17, 8/19, 10/19, 12/19). Workshops were held with Anoka City Council on January 27, 2020 and February 24, 2020.

A public meeting with the general public was held February 20, 2020 from 5 to 7 pm at the Greenhaven Golf Course and Event Center. A Save the Date letter was mailed to project area residents and property owners in September 2019 with background information on the TH 47 study and inviting them to attend the February 2020 public meeting. A subsequent postcard mailing was also sent in early February 2020 with specific time and location details. Approximately 46 people attended according to sign-in sheets (several more did not sign in). The meeting included a series of 8 informational boards, which included a project overview and timeline, description of key issues, and graphics showing neighborhood access, a new McKinley St signal, and nearby transportation

projects. A video visualization of revised three-lane corridor and shared use path was also available. All printed materials and the video visualization are posted on a project website, which is regularly updated with pertinent project information.

Public meeting attendees were invited to provide feedback on the proposed project concept, rating safety, vehicle access and pedestrian/bicycle accommodations. Written and verbal feedback was also recorded. Feedback indicated that between 70 and 80 percent of responding attendees had an overall positive impression of the project concept when rating for safety, access and bicycle/pedestrian aspects; conversely, between 13 and 20 percent held negative views (the balance held neutral opinions).

Measure A: Cost Effectiveness

Total Project Cost (entered in Project Cost Form):	$5,190,000.00
Enter Amount of the Noise Walls:	$0.00
Total Project Cost subtract the amount of the noise walls:	$5,190,000.00
Enter amount of any outside, competitive funding:	$0.00
Attach documentation of award:	
Points Awarded in Previous Criteria	
Cost Effectiveness	$0.00

Other Attachments

TH 47 Congestion Photo

3.5 MB

File Name	Description	File Size
TH47_AnokaCty_LOS.pdf	Anoka County Letter of Support	115 KB
TH47_MnDOT_LOS.pdf	MnDOT Letter of Support	544 KB
TH47_One-Pager_FINAL.pdf	TH 47 One-Page Summary	1.6 MB

Regional Economy

Roadway Reconstruction/Modernization Project: TH 47 Corridor Improvements | Map ID: 1589513419967

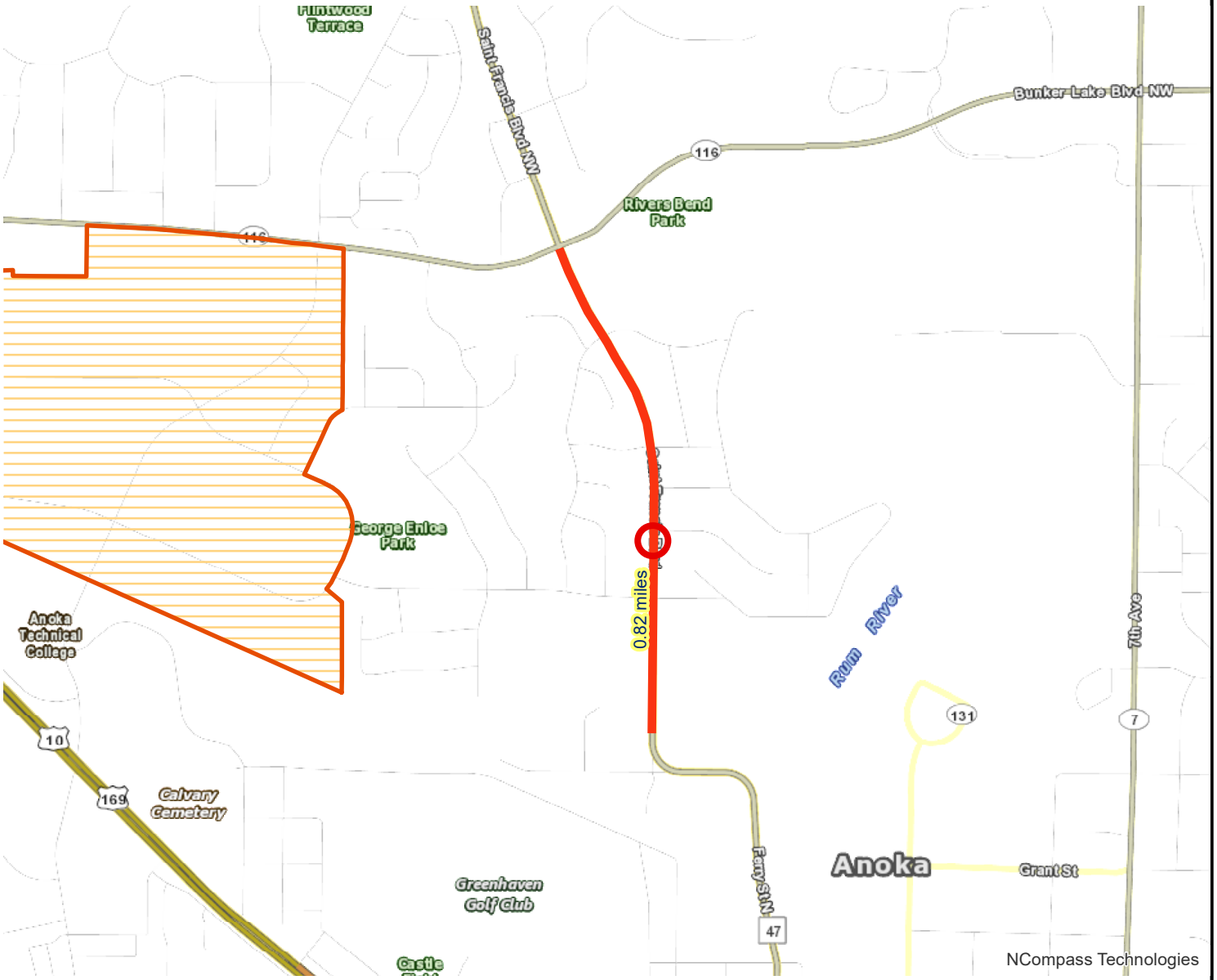
Results

WITHIN ONE MI of project:
Postsecondary Students: 0

Totals by City:

Anoka
Population: 13298
Employment: 10405
Mfg and Dist Employment: 1837

Ramsey
Population: 6652
Employment: 725
Mfg and Dist Employment: 5



Project Points
Project
Manfacturing/Distribution Centers
Job Concentration Centers

0 0.15 0.3 0.6 0.9 1.2 Miles

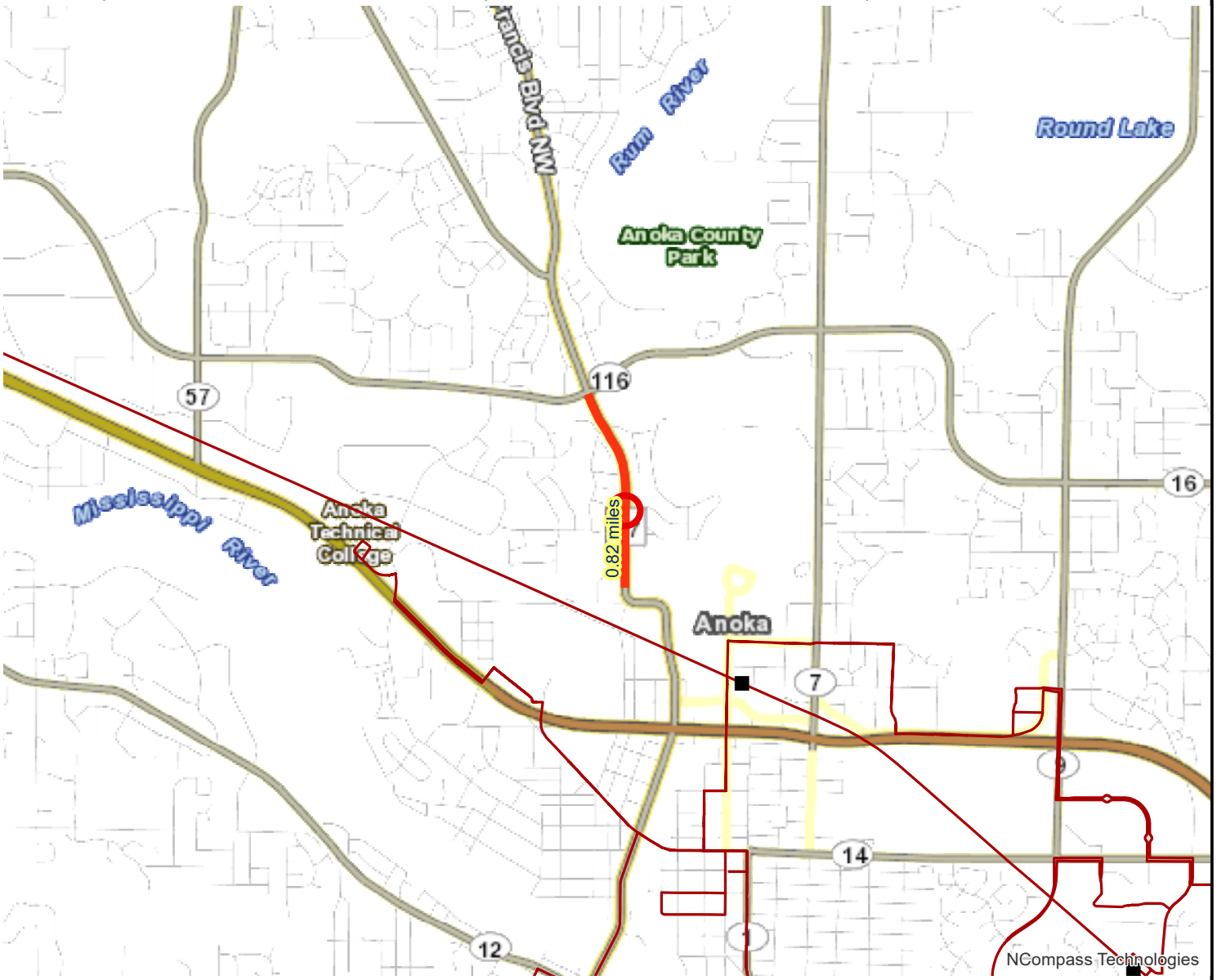
Created: 5/14/2020
LandscapeRSA5

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

METROPOLITAN COUNCIL

Transit Connections

Roadway Reconstruction/Modernization Project: TH 47 Corridor Improvements | Map ID: 1589513419967



Results

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

**indicates Planned Alignments*

Transit Market areas: 3

Project Points
Project
Project Area

Transitway Stations
Northstar Line
Transit Routes

0 0.4 0.8 1.6 2.4 3.2 Miles

Created: 5/14/2020
LandscapeRSA3

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

METROPOLITAN COUNCIL

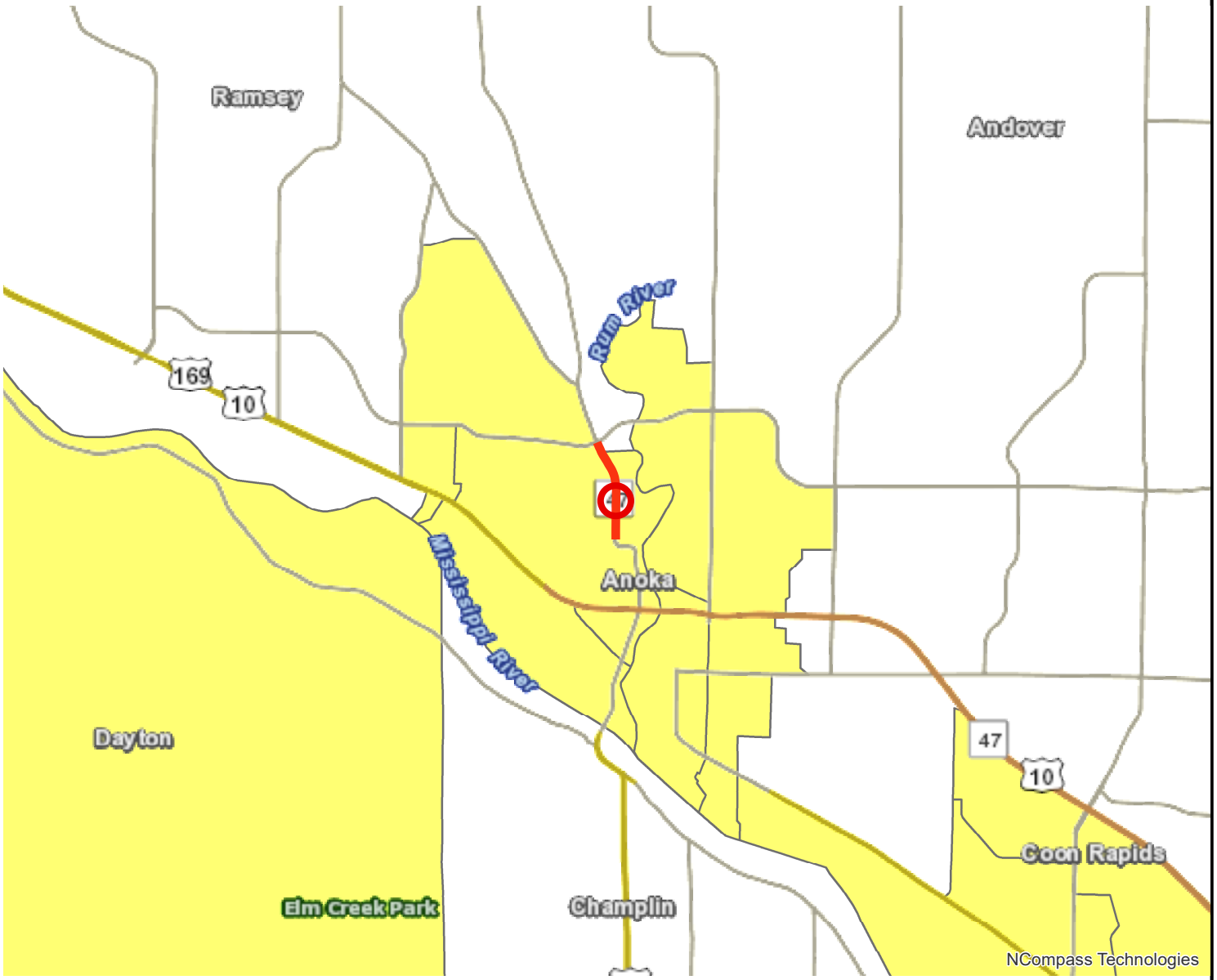
Socio-Economic Conditions

Roadway Reconstruction/Modernization Project: TH 47 Corridor Improvements | Map ID: 1589513419967

Results

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

Tracts within half-mile:
50226 50227 50401
50501 50505



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

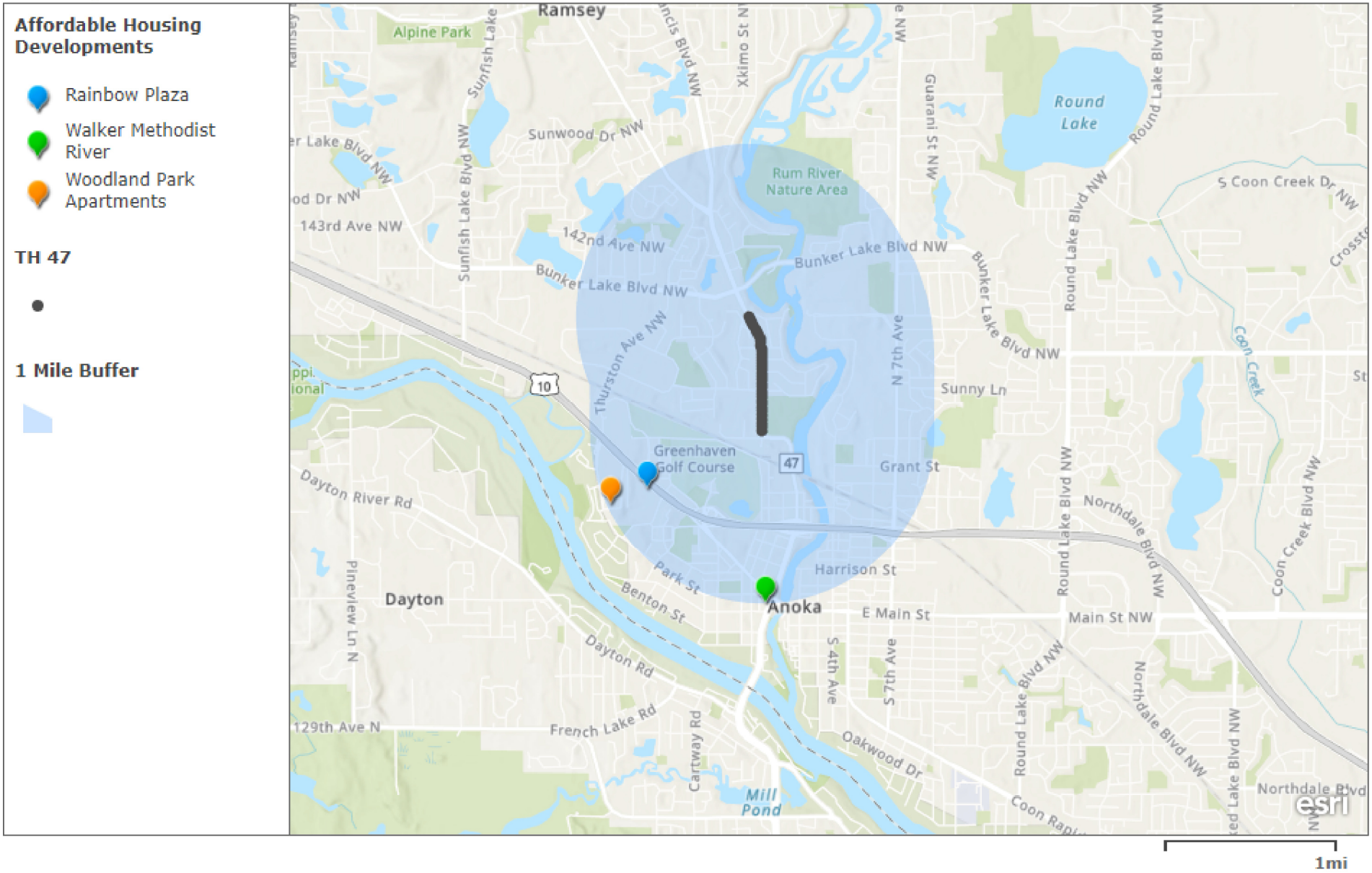
0 0.75 1.5 3 4.5 6 Miles

Created: 5/14/2020
LandscapeRSA2

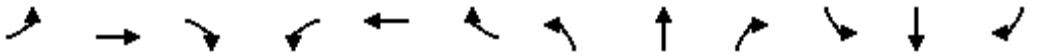
For complete disclaimer of accuracy, please visit
http://giswebsite.metc.state.mn.us/gissite/notice.aspx

METROPOLITAN COUNCIL

TH 47 (St. Francis Blvd) Corridor Improvements - Affordable Housing



Lanes, Volumes, Timings
6: TH 47 & E Mineral Pond Blvd/Coolidge St NW 03/17/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1	3	1	0	14	3	1052	5	9	606	8
Future Volume (vph)	5	1	3	1	0	14	3	1052	5	9	606	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		175	0		225
Storage Lanes	0		0	0		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.955			0.873				0.850			0.850
Flt Protected		0.973			0.997						0.999	
Satd. Flow (prot)	0	1731	0	0	1621	0	0	1863	1583	0	1861	1583
Flt Permitted		0.973			0.997						0.999	
Satd. Flow (perm)	0	1731	0	0	1621	0	0	1863	1583	0	1861	1583
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		468			597			1037			806	
Travel Time (s)		10.6			13.6			15.7			12.2	
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)	5	1	3	1	0	15	3	1143	5	10	659	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	9	0	0	16	0	0	1146	5	0	669	9
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			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 72.2%		ICU Level of Service C	
Analysis Period (min) 15			

Lanes, Volumes, Timings
9: TH 47 & Wilson St

03/17/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	2	0	1	3	1059	14	2	635	3
Future Volume (vph)	0	0	0	2	0	1	3	1059	14	2	635	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		175	0		250
Storage Lanes	0		0	0		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.955				0.850			0.850
Flt Protected					0.968							
Satd. Flow (prot)	0	1863	0	0	1722	0	0	1863	1583	0	1863	1583
Flt Permitted					0.968							
Satd. Flow (perm)	0	1863	0	0	1722	0	0	1863	1583	0	1863	1583
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		665			592			350			1037	
Travel Time (s)		15.1			13.5			5.3			15.7	
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)	0	0	0	2	0	1	3	1151	15	2	690	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	3	0	0	1154	15	0	692	3
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			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 72.6%		ICU Level of Service C	
Analysis Period (min) 15			

Lanes, Volumes, Timings
13: TH 47 & Dunham Dr

03/17/2020

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	1	1075	3	0	636
Future Volume (vph)	1	1	1075	3	0	636
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.932					
Flt Protected	0.976					
Satd. Flow (prot)	1694	0	1863	0	0	1863
Flt Permitted	0.976					
Satd. Flow (perm)	1694	0	1863	0	0	1863
Link Speed (mph)	30		45			45
Link Distance (ft)	633		366			350
Travel Time (s)	14.4		5.5			5.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	1168	3	0	691
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	0	1171	0	0	691
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 66.8%		ICU Level of Service C	
Analysis Period (min) 15			

Lanes, Volumes, Timings
15: TH 47 & McCann Ave

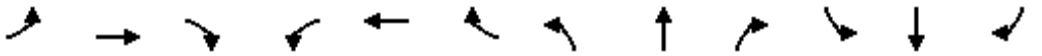
03/17/2020

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	6	0	1078	7	2	635
Future Volume (vph)	6	0	1078	7	2	635
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.999			
Flt Protected	0.950					
Satd. Flow (prot)	1770	0	1861	0	0	1863
Flt Permitted	0.950					
Satd. Flow (perm)	1770	0	1861	0	0	1863
Link Speed (mph)	30		45			45
Link Distance (ft)	782		562			366
Travel Time (s)	17.8		8.5			5.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	0	1172	8	2	690
Shared Lane Traffic (%)						
Lane Group Flow (vph)	7	0	1180	0	0	692
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 67.2%		ICU Level of Service C	
Analysis Period (min) 15			

Lanes, Volumes, Timings
16: TH 47 & McKinley St

03/17/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	122	2	0	3	173	1080	23	2	629	10
Future Volume (vph)	2	0	122	2	0	3	173	1080	23	2	629	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		325	0		200
Storage Lanes	0		0	0		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.867			0.919				0.850			0.850
Flt Protected		0.999			0.980			0.993				
Satd. Flow (prot)	0	1613	0	0	1678	0	0	1850	1583	0	1863	1583
Flt Permitted		0.999			0.980			0.993				
Satd. Flow (perm)	0	1613	0	0	1678	0	0	1850	1583	0	1863	1583
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		770			600			1165			562	
Travel Time (s)		17.5			13.6			17.7			8.5	
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)	2	0	133	2	0	3	188	1174	25	2	684	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	135	0	0	5	0	0	1362	25	0	686	11
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			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	117.3%	ICU Level of Service	H
Analysis Period (min)	15		

Measures of Effectiveness

03/17/2020

Network Totals

Number of Intersections	5
Total Delay (hr)	4
Stops (#)	2100
Average Speed (mph)	39
Total Travel Time (hr)	30
Distance Traveled (mi)	1149
Fuel Consumed (gal)	67
Fuel Economy (mpg)	17.0
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	0
Performance Index	9.8

Detailed Measures of Effectiveness

03/17/2020

6: TH 47 & E Mineral Pond Blvd/Coolidge St NW

Direction	EB	WB	NB	SB	All
Future Volume (vph)	8	15	1059	623	1705
Control Delay / Veh (s/v)	56	24	0	0	1
Queue Delay / Veh (s/v)	0	0	0	0	0
Total Delay / Veh (s/v)	56	24	0	0	1
Total Delay (hr)	0	0	0	0	0
Stops / Veh	1.00	1.00	0.02	0.09	0.06
Stops (#)	8	15	24	56	103
Average Speed (mph)	5	11	45	43	43
Total Travel Time (hr)	0	0	5	2	7
Distance Traveled (mi)	1	2	208	95	305
Fuel Consumed (gal)	0	0	7	4	12
Fuel Economy (mpg)	NA	NA	27.9	23.7	25.8
CO Emissions (kg)	0.01	0.02	0.52	0.28	0.83
NOx Emissions (kg)	0.00	0.00	0.10	0.05	0.16
VOC Emissions (kg)	0.00	0.00	0.12	0.07	0.19
Unserved Vehicles (#)	0	0	0	0	0
Vehicles in dilemma zone (#)	0	0	0	0	0

9: TH 47 & Wilson St

Direction	WB	NB	SB	All
Future Volume (vph)	3	1076	640	1719
Control Delay / Veh (s/v)	54	0	0	0
Queue Delay / Veh (s/v)	0	0	0	0
Total Delay / Veh (s/v)	54	0	0	0
Total Delay (hr)	0	0	0	0
Stops / Veh	1.00	0.02	0.02	0.02
Stops (#)	3	25	12	40
Average Speed (mph)	6	44	45	44
Total Travel Time (hr)	0	2	3	4
Distance Traveled (mi)	0	71	126	197
Fuel Consumed (gal)	0	3	4	7
Fuel Economy (mpg)	NA	25.6	28.1	27.0
CO Emissions (kg)	0.00	0.19	0.31	0.51
NOx Emissions (kg)	0.00	0.04	0.06	0.10
VOC Emissions (kg)	0.00	0.05	0.07	0.12
Unserved Vehicles (#)	0	0	0	0
Vehicles in dilemma zone (#)	0	0	0	0

Detailed Measures of Effectiveness

03/17/2020

13: TH 47 & Dunham Dr

Direction	WB	NB	SB	All
Future Volume (vph)	2	1077	636	1715
Control Delay / Veh (s/v)	36	0	0	0
Queue Delay / Veh (s/v)	0	0	0	0
Total Delay / Veh (s/v)	36	0	0	0
Total Delay (hr)	0	0	0	0
Stops / Veh	1.00	0.00	0.00	0.00
Stops (#)	2	0	0	2
Average Speed (mph)	9	45	45	45
Total Travel Time (hr)	0	2	1	3
Distance Traveled (mi)	0	75	42	117
Fuel Consumed (gal)	0	3	1	4
Fuel Economy (mpg)	NA	29.2	29.2	29.0
CO Emissions (kg)	0.00	0.18	0.10	0.28
NOx Emissions (kg)	0.00	0.03	0.02	0.05
VOC Emissions (kg)	0.00	0.04	0.02	0.07
Unserved Vehicles (#)	0	0	0	0
Vehicles in dilemma zone (#)	0	0	0	0

15: TH 47 & McCann Ave

Direction	WB	NB	SB	All
Future Volume (vph)	6	1086	637	1729
Control Delay / Veh (s/v)	55	0	0	0
Queue Delay / Veh (s/v)	0	0	0	0
Total Delay / Veh (s/v)	55	0	0	0
Total Delay (hr)	0	0	0	0
Stops / Veh	1.00	0.00	0.02	0.01
Stops (#)	6	0	12	18
Average Speed (mph)	7	45	45	44
Total Travel Time (hr)	0	3	1	4
Distance Traveled (mi)	1	116	44	161
Fuel Consumed (gal)	0	4	2	6
Fuel Economy (mpg)	NA	29.2	26.4	27.8
CO Emissions (kg)	0.01	0.28	0.12	0.40
NOx Emissions (kg)	0.00	0.05	0.02	0.08
VOC Emissions (kg)	0.00	0.06	0.03	0.09
Unserved Vehicles (#)	0	0	0	0
Vehicles in dilemma zone (#)	0	0	0	0

Detailed Measures of Effectiveness

03/17/2020

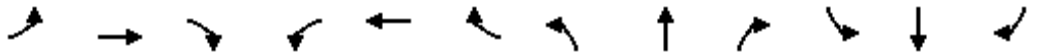
16: TH 47 & McKinley St

Direction	EB	WB	NB	SB	All
Future Volume (vph)	124	5	1276	641	2046
Control Delay / Veh (s/v)	21	134	7	0	6
Queue Delay / Veh (s/v)	0	0	0	0	0
Total Delay / Veh (s/v)	21	134	7	0	6
Total Delay (hr)	1	0	2	0	3
Stops / Veh	1.00	1.00	1.41	0.02	0.95
Stops (#)	124	5	1796	12	1937
Average Speed (mph)	14	3	32	45	31
Total Travel Time (hr)	1	0	9	2	12
Distance Traveled (mi)	18	1	282	68	368
Fuel Consumed (gal)	2	0	34	3	38
Fuel Economy (mpg)	9.2	NA	8.3	27.3	9.6
CO Emissions (kg)	0.14	0.01	2.36	0.17	2.69
NOx Emissions (kg)	0.03	0.00	0.46	0.03	0.52
VOC Emissions (kg)	0.03	0.00	0.55	0.04	0.62
Unserved Vehicles (#)	0	0	0	0	0
Vehicles in dilemma zone (#)	0	0	0	0	0

Network Totals

Number of Intersections	5
Control Delay / Veh (s/v)	2
Queue Delay / Veh (s/v)	0
Total Delay / Veh (s/v)	2
Total Delay (hr)	4
Stops / Veh	0.24
Stops (#)	2100
Average Speed (mph)	39
Total Travel Time (hr)	30
Distance Traveled (mi)	1149
Fuel Consumed (gal)	67
Fuel Economy (mpg)	17.0
CO Emissions (kg)	4.71
NOx Emissions (kg)	0.92
VOC Emissions (kg)	1.09
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	0
Performance Index	9.8

Lanes, Volumes, Timings
6: TH 47 & E Mineral Pond Blvd/Coolidge St NW 03/17/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	4	0	0	14	0	1052	5	0	615	8
Future Volume (vph)	0	0	4	0	0	14	0	1052	5	0	615	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		125	0		225
Storage Lanes	0		1	0		1	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.865			0.865			0.850			0.850
Flt Protected												
Satd. Flow (prot)	0	0	1611	0	0	1611	0	1863	1583	0	1863	1583
Flt Permitted												
Satd. Flow (perm)	0	0	1611	0	0	1611	0	1863	1583	0	1863	1583
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		468			597			1037			816	
Travel Time (s)		10.6			13.6			15.7			12.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	4	0	0	15	0	1143	5	0	668	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	4	0	0	15	0	1143	5	0	668	9
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 65.4%		ICU Level of Service C	
Analysis Period (min) 15			

Lanes, Volumes, Timings
9: TH 47 & Wilson St

03/17/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	0	3	0	2	6	1056	17	13	634	3
Future Volume (vph)	5	0	0	3	0	2	6	1056	17	13	634	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	125		125	125		125
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (ft)	25			25			180			180		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.946				0.850			0.850
Flt Protected		0.950			0.971		0.950			0.950		
Satd. Flow (prot)	0	1770	0	0	1711	0	1770	1863	1583	1770	1863	1583
Flt Permitted		0.950			0.971		0.950			0.950		
Satd. Flow (perm)	0	1770	0	0	1711	0	1770	1863	1583	1770	1863	1583
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		665			592			1277			1037	
Travel Time (s)		15.1			13.5			19.3			15.7	
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)	5	0	0	3	0	2	7	1148	18	14	689	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	5	0	0	5	0	7	1148	18	14	689	3
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								Yes				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

Lanes, Volumes, Timings
16: TH 47 & McKinley St

03/17/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	122	9	0	3	173	1073	30	3	622	10
Future Volume (vph)	2	0	122	9	0	3	173	1073	30	3	622	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		0	110		0	275		275	250		125
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	120			120			180			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.850				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1583	0	1770	1583	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.756			0.635			0.372			0.143		
Satd. Flow (perm)	1408	1583	0	1183	1583	0	693	1863	1583	266	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		311			121				33			18
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		770			600			1165			1277	
Travel Time (s)		17.5			13.6			17.7			19.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	0	133	10	0	3	188	1166	33	3	676	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	2	133	0	10	3	0	188	1166	33	3	676	11
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6

Lanes, Volumes, Timings
16: TH 47 & McKinley St

03/17/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		22.5	22.5		22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5		22.5	22.5		67.5	67.5	67.5	67.5	67.5	67.5
Total Split (%)	25.0%	25.0%		25.0%	25.0%		75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Maximum Green (s)	18.0	18.0		18.0	18.0		63.0	63.0	63.0	63.0	63.0	63.0
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	Min
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	6.3	6.3		6.3	6.3		53.4	53.4	53.4	53.4	53.4	53.4
Actuated g/C Ratio	0.09	0.09		0.09	0.09		0.78	0.78	0.78	0.78	0.78	0.78
v/c Ratio	0.02	0.31		0.09	0.01		0.35	0.81	0.03	0.01	0.47	0.01
Control Delay	32.0	1.9		33.9	0.0		4.4	10.2	0.7	2.0	3.9	0.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.0	1.9		33.9	0.0		4.4	10.2	0.7	2.0	3.9	0.6
LOS	C	A		C	A		A	B	A	A	A	A
Approach Delay		2.3			26.1			9.2			3.8	
Approach LOS		A			C			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 68.9			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 7.2		Intersection LOS: A	
Intersection Capacity Utilization 79.4%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 16: TH 47 & McKinley St

Measures of Effectiveness

03/17/2020

Network Totals

Number of Intersections	3
Total Delay (hr)	4
Stops (#)	910
Average Speed (mph)	38
Total Travel Time (hr)	30
Distance Traveled (mi)	1150
Fuel Consumed (gal)	54
Fuel Economy (mpg)	21.4
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	119
Performance Index	6.9

Detailed Measures of Effectiveness

03/17/2020

6: TH 47 & E Mineral Pond Blvd/Coolidge St NW

Direction	EB	WB	NB	SB	All
Future Volume (vph)	4	14	1057	623	1698
Control Delay / Veh (s/v)	13	21	0	0	0
Queue Delay / Veh (s/v)	0	0	0	0	0
Total Delay / Veh (s/v)	13	21	0	0	0
Total Delay (hr)	0	0	0	0	0
Stops / Veh	1.00	1.00	0.00	0.00	0.01
Stops (#)	4	14	0	0	18
Average Speed (mph)	14	12	45	45	44
Total Travel Time (hr)	0	0	5	2	7
Distance Traveled (mi)	0	2	208	96	306
Fuel Consumed (gal)	0	0	7	3	11
Fuel Economy (mpg)	NA	NA	29.2	29.2	28.7
CO Emissions (kg)	0.00	0.01	0.50	0.23	0.75
NOx Emissions (kg)	0.00	0.00	0.10	0.04	0.15
VOC Emissions (kg)	0.00	0.00	0.12	0.05	0.17
Unserved Vehicles (#)	0	0	0	0	0
Vehicles in dilemma zone (#)	0	0	0	0	0

9: TH 47 & Wilson St

Direction	EB	WB	NB	SB	All
Future Volume (vph)	5	5	1079	650	1739
Control Delay / Veh (s/v)	29	25	0	0	0
Queue Delay / Veh (s/v)	0	0	0	0	0
Total Delay / Veh (s/v)	29	25	0	0	0
Total Delay (hr)	0	0	0	0	0
Stops / Veh	1.00	1.00	0.01	0.06	0.04
Stops (#)	5	5	11	41	62
Average Speed (mph)	10	10	45	44	44
Total Travel Time (hr)	0	0	6	3	9
Distance Traveled (mi)	1	1	261	128	390
Fuel Consumed (gal)	0	0	9	5	14
Fuel Economy (mpg)	NA	NA	28.7	25.9	27.5
CO Emissions (kg)	0.01	0.01	0.64	0.34	0.99
NOx Emissions (kg)	0.00	0.00	0.12	0.07	0.19
VOC Emissions (kg)	0.00	0.00	0.15	0.08	0.23
Unserved Vehicles (#)	0	0	0	0	0
Vehicles in dilemma zone (#)	0	0	0	0	0

Detailed Measures of Effectiveness

03/17/2020

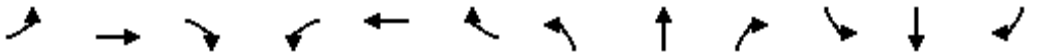
16: TH 47 & McKinley St

Direction	EB	WB	NB	SB	All
Future Volume (vph)	124	12	1276	635	2047
Control Delay / Veh (s/v)	2	25	9	4	7
Queue Delay / Veh (s/v)	0	0	0	0	0
Total Delay / Veh (s/v)	2	25	9	4	7
Total Delay (hr)	0	0	3	1	4
Stops / Veh	0.02	1.00	0.50	0.29	0.41
Stops (#)	3	12	634	181	830
Average Speed (mph)	26	10	30	38	31
Total Travel Time (hr)	1	0	10	4	14
Distance Traveled (mi)	18	1	282	154	455
Fuel Consumed (gal)	1	0	20	8	29
Fuel Economy (mpg)	NA	NA	14.1	19.2	15.7
CO Emissions (kg)	0.06	0.01	1.39	0.56	2.02
NOx Emissions (kg)	0.01	0.00	0.27	0.11	0.39
VOC Emissions (kg)	0.01	0.00	0.32	0.13	0.47
Unserved Vehicles (#)	0	0	0	0	0
Vehicles in dilemma zone (#)	0	0	77	42	119

Network Totals

Number of Intersections	3
Control Delay / Veh (s/v)	3
Queue Delay / Veh (s/v)	0
Total Delay / Veh (s/v)	3
Total Delay (hr)	4
Stops / Veh	0.17
Stops (#)	910
Average Speed (mph)	38
Total Travel Time (hr)	30
Distance Traveled (mi)	1150
Fuel Consumed (gal)	54
Fuel Economy (mpg)	21.4
CO Emissions (kg)	3.76
NOx Emissions (kg)	0.73
VOC Emissions (kg)	0.87
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	119
Performance Index	6.9

Lanes, Volumes, Timings
6: TH 47 & E Mineral Pond Blvd/Coolidge St NW 03/17/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1	3	1	0	14	3	1052	5	9	606	8
Future Volume (vph)	5	1	3	1	0	14	3	1052	5	9	606	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		175	0		225
Storage Lanes	0		0	0		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.955			0.873				0.850			0.850
Flt Protected		0.973			0.997						0.999	
Satd. Flow (prot)	0	1731	0	0	1621	0	0	1863	1583	0	1861	1583
Flt Permitted		0.973			0.997						0.999	
Satd. Flow (perm)	0	1731	0	0	1621	0	0	1863	1583	0	1861	1583
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		468			597			1037			806	
Travel Time (s)		10.6			13.6			15.7			12.2	
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)	5	1	3	1	0	15	3	1143	5	10	659	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	9	0	0	16	0	0	1146	5	0	669	9
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			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 72.2%		ICU Level of Service C	
Analysis Period (min) 15			

Lanes, Volumes, Timings
9: TH 47 & Wilson St

03/17/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	2	0	1	3	1059	14	2	635	3
Future Volume (vph)	0	0	0	2	0	1	3	1059	14	2	635	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		175	0		250
Storage Lanes	0		0	0		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.955				0.850			0.850
Flt Protected					0.968							
Satd. Flow (prot)	0	1863	0	0	1722	0	0	1863	1583	0	1863	1583
Flt Permitted					0.968							
Satd. Flow (perm)	0	1863	0	0	1722	0	0	1863	1583	0	1863	1583
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		665			592			350			1037	
Travel Time (s)		15.1			13.5			5.3			15.7	
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)	0	0	0	2	0	1	3	1151	15	2	690	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	3	0	0	1154	15	0	692	3
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			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 72.6%		ICU Level of Service C	
Analysis Period (min) 15			

Lanes, Volumes, Timings
13: TH 47 & Dunham Dr

03/17/2020

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	1	1075	3	0	636
Future Volume (vph)	1	1	1075	3	0	636
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.932					
Flt Protected	0.976					
Satd. Flow (prot)	1694	0	1863	0	0	1863
Flt Permitted	0.976					
Satd. Flow (perm)	1694	0	1863	0	0	1863
Link Speed (mph)	30		45			45
Link Distance (ft)	633		366			350
Travel Time (s)	14.4		5.5			5.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	1168	3	0	691
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	0	1171	0	0	691
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 66.8%		ICU Level of Service C	
Analysis Period (min) 15			

Lanes, Volumes, Timings
15: TH 47 & McCann Ave

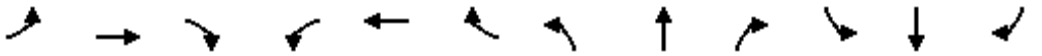
03/17/2020

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	6	0	1078	7	2	635
Future Volume (vph)	6	0	1078	7	2	635
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.999			
Flt Protected	0.950					
Satd. Flow (prot)	1770	0	1861	0	0	1863
Flt Permitted	0.950					
Satd. Flow (perm)	1770	0	1861	0	0	1863
Link Speed (mph)	30		45			45
Link Distance (ft)	782		562			366
Travel Time (s)	17.8		8.5			5.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	0	1172	8	2	690
Shared Lane Traffic (%)						
Lane Group Flow (vph)	7	0	1180	0	0	692
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 67.2%		ICU Level of Service C	
Analysis Period (min) 15			

Lanes, Volumes, Timings
16: TH 47 & McKinley St

03/17/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	122	2	0	3	173	1080	23	2	629	10
Future Volume (vph)	2	0	122	2	0	3	173	1080	23	2	629	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		325	0		200
Storage Lanes	0		0	0		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.867			0.919				0.850			0.850
Flt Protected		0.999			0.980			0.993				
Satd. Flow (prot)	0	1613	0	0	1678	0	0	1850	1583	0	1863	1583
Flt Permitted		0.999			0.980			0.993				
Satd. Flow (perm)	0	1613	0	0	1678	0	0	1850	1583	0	1863	1583
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		770			600			1165			562	
Travel Time (s)		17.5			13.6			17.7			8.5	
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)	2	0	133	2	0	3	188	1174	25	2	684	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	135	0	0	5	0	0	1362	25	0	686	11
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			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	117.3%	ICU Level of Service	H
Analysis Period (min)	15		

Measures of Effectiveness

03/17/2020

Network Totals

Number of Intersections	5
Total Delay (hr)	4
Stops (#)	2100
Average Speed (mph)	39
Total Travel Time (hr)	30
Distance Traveled (mi)	1149
Fuel Consumed (gal)	67
Fuel Economy (mpg)	17.0
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	0
Performance Index	9.8

Detailed Measures of Effectiveness

03/17/2020

6: TH 47 & E Mineral Pond Blvd/Coolidge St NW

Direction	EB	WB	NB	SB	All
Future Volume (vph)	8	15	1059	623	1705
Control Delay / Veh (s/v)	56	24	0	0	1
Queue Delay / Veh (s/v)	0	0	0	0	0
Total Delay / Veh (s/v)	56	24	0	0	1
Total Delay (hr)	0	0	0	0	0
Stops / Veh	1.00	1.00	0.02	0.09	0.06
Stops (#)	8	15	24	56	103
Average Speed (mph)	5	11	45	43	43
Total Travel Time (hr)	0	0	5	2	7
Distance Traveled (mi)	1	2	208	95	305
Fuel Consumed (gal)	0	0	7	4	12
Fuel Economy (mpg)	NA	NA	27.9	23.7	25.8
CO Emissions (kg)	0.01	0.02	0.52	0.28	0.83
NOx Emissions (kg)	0.00	0.00	0.10	0.05	0.16
VOC Emissions (kg)	0.00	0.00	0.12	0.07	0.19
Unserved Vehicles (#)	0	0	0	0	0
Vehicles in dilemma zone (#)	0	0	0	0	0

9: TH 47 & Wilson St

Direction	WB	NB	SB	All
Future Volume (vph)	3	1076	640	1719
Control Delay / Veh (s/v)	54	0	0	0
Queue Delay / Veh (s/v)	0	0	0	0
Total Delay / Veh (s/v)	54	0	0	0
Total Delay (hr)	0	0	0	0
Stops / Veh	1.00	0.02	0.02	0.02
Stops (#)	3	25	12	40
Average Speed (mph)	6	44	45	44
Total Travel Time (hr)	0	2	3	4
Distance Traveled (mi)	0	71	126	197
Fuel Consumed (gal)	0	3	4	7
Fuel Economy (mpg)	NA	25.6	28.1	27.0
CO Emissions (kg)	0.00	0.19	0.31	0.51
NOx Emissions (kg)	0.00	0.04	0.06	0.10
VOC Emissions (kg)	0.00	0.05	0.07	0.12
Unserved Vehicles (#)	0	0	0	0
Vehicles in dilemma zone (#)	0	0	0	0

Detailed Measures of Effectiveness

03/17/2020

13: TH 47 & Dunham Dr

Direction	WB	NB	SB	All
Future Volume (vph)	2	1077	636	1715
Control Delay / Veh (s/v)	36	0	0	0
Queue Delay / Veh (s/v)	0	0	0	0
Total Delay / Veh (s/v)	36	0	0	0
Total Delay (hr)	0	0	0	0
Stops / Veh	1.00	0.00	0.00	0.00
Stops (#)	2	0	0	2
Average Speed (mph)	9	45	45	45
Total Travel Time (hr)	0	2	1	3
Distance Traveled (mi)	0	75	42	117
Fuel Consumed (gal)	0	3	1	4
Fuel Economy (mpg)	NA	29.2	29.2	29.0
CO Emissions (kg)	0.00	0.18	0.10	0.28
NOx Emissions (kg)	0.00	0.03	0.02	0.05
VOC Emissions (kg)	0.00	0.04	0.02	0.07
Unserved Vehicles (#)	0	0	0	0
Vehicles in dilemma zone (#)	0	0	0	0

15: TH 47 & McCann Ave

Direction	WB	NB	SB	All
Future Volume (vph)	6	1086	637	1729
Control Delay / Veh (s/v)	55	0	0	0
Queue Delay / Veh (s/v)	0	0	0	0
Total Delay / Veh (s/v)	55	0	0	0
Total Delay (hr)	0	0	0	0
Stops / Veh	1.00	0.00	0.02	0.01
Stops (#)	6	0	12	18
Average Speed (mph)	7	45	45	44
Total Travel Time (hr)	0	3	1	4
Distance Traveled (mi)	1	116	44	161
Fuel Consumed (gal)	0	4	2	6
Fuel Economy (mpg)	NA	29.2	26.4	27.8
CO Emissions (kg)	0.01	0.28	0.12	0.40
NOx Emissions (kg)	0.00	0.05	0.02	0.08
VOC Emissions (kg)	0.00	0.06	0.03	0.09
Unserved Vehicles (#)	0	0	0	0
Vehicles in dilemma zone (#)	0	0	0	0

Detailed Measures of Effectiveness

03/17/2020

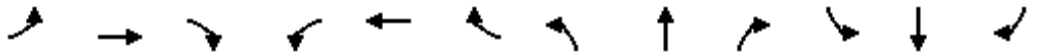
16: TH 47 & McKinley St

Direction	EB	WB	NB	SB	All
Future Volume (vph)	124	5	1276	641	2046
Control Delay / Veh (s/v)	21	134	7	0	6
Queue Delay / Veh (s/v)	0	0	0	0	0
Total Delay / Veh (s/v)	21	134	7	0	6
Total Delay (hr)	1	0	2	0	3
Stops / Veh	1.00	1.00	1.41	0.02	0.95
Stops (#)	124	5	1796	12	1937
Average Speed (mph)	14	3	32	45	31
Total Travel Time (hr)	1	0	9	2	12
Distance Traveled (mi)	18	1	282	68	368
Fuel Consumed (gal)	2	0	34	3	38
Fuel Economy (mpg)	9.2	NA	8.3	27.3	9.6
CO Emissions (kg)	0.14	0.01	2.36	0.17	2.69
NOx Emissions (kg)	0.03	0.00	0.46	0.03	0.52
VOC Emissions (kg)	0.03	0.00	0.55	0.04	0.62
Unserved Vehicles (#)	0	0	0	0	0
Vehicles in dilemma zone (#)	0	0	0	0	0

Network Totals

Number of Intersections	5
Control Delay / Veh (s/v)	2
Queue Delay / Veh (s/v)	0
Total Delay / Veh (s/v)	2
Total Delay (hr)	4
Stops / Veh	0.24
Stops (#)	2100
Average Speed (mph)	39
Total Travel Time (hr)	30
Distance Traveled (mi)	1149
Fuel Consumed (gal)	67
Fuel Economy (mpg)	17.0
CO Emissions (kg)	4.71
NOx Emissions (kg)	0.92
VOC Emissions (kg)	1.09
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	0
Performance Index	9.8

Lanes, Volumes, Timings
6: TH 47 & E Mineral Pond Blvd/Coolidge St NW 03/17/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	4	0	0	14	0	1052	5	0	615	8
Future Volume (vph)	0	0	4	0	0	14	0	1052	5	0	615	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		125	0		225
Storage Lanes	0		1	0		1	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.865			0.865			0.850			0.850
Flt Protected												
Satd. Flow (prot)	0	0	1611	0	0	1611	0	1863	1583	0	1863	1583
Flt Permitted												
Satd. Flow (perm)	0	0	1611	0	0	1611	0	1863	1583	0	1863	1583
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		468			597			1037			816	
Travel Time (s)		10.6			13.6			15.7			12.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	4	0	0	15	0	1143	5	0	668	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	4	0	0	15	0	1143	5	0	668	9
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 65.4%		ICU Level of Service C	
Analysis Period (min) 15			

Lanes, Volumes, Timings
9: TH 47 & Wilson St

03/17/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	0	3	0	2	6	1056	17	13	634	3
Future Volume (vph)	5	0	0	3	0	2	6	1056	17	13	634	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	125		125	125		125
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (ft)	25			25			180			180		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.946				0.850			0.850
Flt Protected		0.950			0.971		0.950			0.950		
Satd. Flow (prot)	0	1770	0	0	1711	0	1770	1863	1583	1770	1863	1583
Flt Permitted		0.950			0.971		0.950			0.950		
Satd. Flow (perm)	0	1770	0	0	1711	0	1770	1863	1583	1770	1863	1583
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		665			592			1277			1037	
Travel Time (s)		15.1			13.5			19.3			15.7	
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)	5	0	0	3	0	2	7	1148	18	14	689	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	5	0	0	5	0	7	1148	18	14	689	3
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								Yes				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

Lanes, Volumes, Timings
16: TH 47 & McKinley St

03/17/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	122	9	0	3	173	1073	30	3	622	10
Future Volume (vph)	2	0	122	9	0	3	173	1073	30	3	622	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		0	110		0	275		275	250		125
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	120			120			180			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.850				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1583	0	1770	1583	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.756			0.635			0.372			0.143		
Satd. Flow (perm)	1408	1583	0	1183	1583	0	693	1863	1583	266	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		311			121				33			18
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		770			600			1165			1277	
Travel Time (s)		17.5			13.6			17.7			19.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	0	133	10	0	3	188	1166	33	3	676	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	2	133	0	10	3	0	188	1166	33	3	676	11
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6

Lanes, Volumes, Timings
16: TH 47 & McKinley St

03/17/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		22.5	22.5		22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5		22.5	22.5		67.5	67.5	67.5	67.5	67.5	67.5
Total Split (%)	25.0%	25.0%		25.0%	25.0%		75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Maximum Green (s)	18.0	18.0		18.0	18.0		63.0	63.0	63.0	63.0	63.0	63.0
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	Min
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	6.3	6.3		6.3	6.3		53.4	53.4	53.4	53.4	53.4	53.4
Actuated g/C Ratio	0.09	0.09		0.09	0.09		0.78	0.78	0.78	0.78	0.78	0.78
v/c Ratio	0.02	0.31		0.09	0.01		0.35	0.81	0.03	0.01	0.47	0.01
Control Delay	32.0	1.9		33.9	0.0		4.4	10.2	0.7	2.0	3.9	0.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.0	1.9		33.9	0.0		4.4	10.2	0.7	2.0	3.9	0.6
LOS	C	A		C	A		A	B	A	A	A	A
Approach Delay		2.3			26.1			9.2			3.8	
Approach LOS		A			C			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 68.9			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 7.2		Intersection LOS: A	
Intersection Capacity Utilization 79.4%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 16: TH 47 & McKinley St

Measures of Effectiveness

03/17/2020

Network Totals

Number of Intersections	3
Total Delay (hr)	4
Stops (#)	910
Average Speed (mph)	38
Total Travel Time (hr)	30
Distance Traveled (mi)	1150
Fuel Consumed (gal)	54
Fuel Economy (mpg)	21.4
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	119
Performance Index	6.9

Detailed Measures of Effectiveness

03/17/2020

6: TH 47 & E Mineral Pond Blvd/Coolidge St NW

Direction	EB	WB	NB	SB	All
Future Volume (vph)	4	14	1057	623	1698
Control Delay / Veh (s/v)	13	21	0	0	0
Queue Delay / Veh (s/v)	0	0	0	0	0
Total Delay / Veh (s/v)	13	21	0	0	0
Total Delay (hr)	0	0	0	0	0
Stops / Veh	1.00	1.00	0.00	0.00	0.01
Stops (#)	4	14	0	0	18
Average Speed (mph)	14	12	45	45	44
Total Travel Time (hr)	0	0	5	2	7
Distance Traveled (mi)	0	2	208	96	306
Fuel Consumed (gal)	0	0	7	3	11
Fuel Economy (mpg)	NA	NA	29.2	29.2	28.7
CO Emissions (kg)	0.00	0.01	0.50	0.23	0.75
NOx Emissions (kg)	0.00	0.00	0.10	0.04	0.15
VOC Emissions (kg)	0.00	0.00	0.12	0.05	0.17
Unserved Vehicles (#)	0	0	0	0	0
Vehicles in dilemma zone (#)	0	0	0	0	0

9: TH 47 & Wilson St

Direction	EB	WB	NB	SB	All
Future Volume (vph)	5	5	1079	650	1739
Control Delay / Veh (s/v)	29	25	0	0	0
Queue Delay / Veh (s/v)	0	0	0	0	0
Total Delay / Veh (s/v)	29	25	0	0	0
Total Delay (hr)	0	0	0	0	0
Stops / Veh	1.00	1.00	0.01	0.06	0.04
Stops (#)	5	5	11	41	62
Average Speed (mph)	10	10	45	44	44
Total Travel Time (hr)	0	0	6	3	9
Distance Traveled (mi)	1	1	261	128	390
Fuel Consumed (gal)	0	0	9	5	14
Fuel Economy (mpg)	NA	NA	28.7	25.9	27.5
CO Emissions (kg)	0.01	0.01	0.64	0.34	0.99
NOx Emissions (kg)	0.00	0.00	0.12	0.07	0.19
VOC Emissions (kg)	0.00	0.00	0.15	0.08	0.23
Unserved Vehicles (#)	0	0	0	0	0
Vehicles in dilemma zone (#)	0	0	0	0	0

Detailed Measures of Effectiveness

03/17/2020

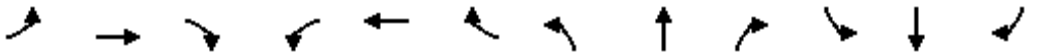
16: TH 47 & McKinley St

Direction	EB	WB	NB	SB	All
Future Volume (vph)	124	12	1276	635	2047
Control Delay / Veh (s/v)	2	25	9	4	7
Queue Delay / Veh (s/v)	0	0	0	0	0
Total Delay / Veh (s/v)	2	25	9	4	7
Total Delay (hr)	0	0	3	1	4
Stops / Veh	0.02	1.00	0.50	0.29	0.41
Stops (#)	3	12	634	181	830
Average Speed (mph)	26	10	30	38	31
Total Travel Time (hr)	1	0	10	4	14
Distance Traveled (mi)	18	1	282	154	455
Fuel Consumed (gal)	1	0	20	8	29
Fuel Economy (mpg)	NA	NA	14.1	19.2	15.7
CO Emissions (kg)	0.06	0.01	1.39	0.56	2.02
NOx Emissions (kg)	0.01	0.00	0.27	0.11	0.39
VOC Emissions (kg)	0.01	0.00	0.32	0.13	0.47
Unserved Vehicles (#)	0	0	0	0	0
Vehicles in dilemma zone (#)	0	0	77	42	119

Network Totals

Number of Intersections	3
Control Delay / Veh (s/v)	3
Queue Delay / Veh (s/v)	0
Total Delay / Veh (s/v)	3
Total Delay (hr)	4
Stops / Veh	0.17
Stops (#)	910
Average Speed (mph)	38
Total Travel Time (hr)	30
Distance Traveled (mi)	1150
Fuel Consumed (gal)	54
Fuel Economy (mpg)	21.4
CO Emissions (kg)	3.76
NOx Emissions (kg)	0.73
VOC Emissions (kg)	0.87
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	119
Performance Index	6.9

Lanes, Volumes, Timings
6: TH 47 & E Mineral Pond Blvd/Coolidge St NW 03/17/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1	3	1	0	14	3	1052	5	9	606	8
Future Volume (vph)	5	1	3	1	0	14	3	1052	5	9	606	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		175	0		225
Storage Lanes	0		0	0		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.955			0.873				0.850			0.850
Flt Protected		0.973			0.997						0.999	
Satd. Flow (prot)	0	1731	0	0	1621	0	0	1863	1583	0	1861	1583
Flt Permitted		0.973			0.997						0.999	
Satd. Flow (perm)	0	1731	0	0	1621	0	0	1863	1583	0	1861	1583
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		468			597			1037			806	
Travel Time (s)		10.6			13.6			15.7			12.2	
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)	5	1	3	1	0	15	3	1143	5	10	659	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	9	0	0	16	0	0	1146	5	0	669	9
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			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 72.2%		ICU Level of Service C	
Analysis Period (min) 15			

Lanes, Volumes, Timings
9: TH 47 & Wilson St

03/17/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	2	0	1	3	1059	14	2	635	3
Future Volume (vph)	0	0	0	2	0	1	3	1059	14	2	635	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		175	0		250
Storage Lanes	0		0	0		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.955				0.850			0.850
Flt Protected					0.968							
Satd. Flow (prot)	0	1863	0	0	1722	0	0	1863	1583	0	1863	1583
Flt Permitted					0.968							
Satd. Flow (perm)	0	1863	0	0	1722	0	0	1863	1583	0	1863	1583
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		665			592			350			1037	
Travel Time (s)		15.1			13.5			5.3			15.7	
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)	0	0	0	2	0	1	3	1151	15	2	690	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	3	0	0	1154	15	0	692	3
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			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 72.6%		ICU Level of Service C	
Analysis Period (min) 15			

Lanes, Volumes, Timings
13: TH 47 & Dunham Dr

03/17/2020

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1	1	1075	3	0	636
Future Volume (vph)	1	1	1075	3	0	636
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.932					
Flt Protected	0.976					
Satd. Flow (prot)	1694	0	1863	0	0	1863
Flt Permitted	0.976					
Satd. Flow (perm)	1694	0	1863	0	0	1863
Link Speed (mph)	30		45			45
Link Distance (ft)	633		366			350
Travel Time (s)	14.4		5.5			5.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	1168	3	0	691
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	0	1171	0	0	691
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 66.8%		ICU Level of Service C	
Analysis Period (min) 15			

Lanes, Volumes, Timings
15: TH 47 & McCann Ave

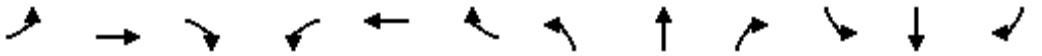
03/17/2020

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	6	0	1078	7	2	635
Future Volume (vph)	6	0	1078	7	2	635
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.999			
Flt Protected	0.950					
Satd. Flow (prot)	1770	0	1861	0	0	1863
Flt Permitted	0.950					
Satd. Flow (perm)	1770	0	1861	0	0	1863
Link Speed (mph)	30		45			45
Link Distance (ft)	782		562			366
Travel Time (s)	17.8		8.5			5.5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	0	1172	8	2	690
Shared Lane Traffic (%)						
Lane Group Flow (vph)	7	0	1180	0	0	692
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		0			0
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 67.2%		ICU Level of Service C	
Analysis Period (min) 15			

Lanes, Volumes, Timings
16: TH 47 & McKinley St

03/17/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	122	2	0	3	173	1080	23	2	629	10
Future Volume (vph)	2	0	122	2	0	3	173	1080	23	2	629	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		325	0		200
Storage Lanes	0		0	0		0	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.867			0.919				0.850			0.850
Flt Protected		0.999			0.980			0.993				
Satd. Flow (prot)	0	1613	0	0	1678	0	0	1850	1583	0	1863	1583
Flt Permitted		0.999			0.980			0.993				
Satd. Flow (perm)	0	1613	0	0	1678	0	0	1850	1583	0	1863	1583
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		770			600			1165			562	
Travel Time (s)		17.5			13.6			17.7			8.5	
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)	2	0	133	2	0	3	188	1174	25	2	684	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	135	0	0	5	0	0	1362	25	0	686	11
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			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	117.3%	ICU Level of Service	H
Analysis Period (min)	15		

Measures of Effectiveness

03/17/2020

Network Totals

Number of Intersections	5
Total Delay (hr)	4
Stops (#)	2100
Average Speed (mph)	39
Total Travel Time (hr)	30
Distance Traveled (mi)	1149
Fuel Consumed (gal)	67
Fuel Economy (mpg)	17.0
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	0
Performance Index	9.8

Detailed Measures of Effectiveness

03/17/2020

6: TH 47 & E Mineral Pond Blvd/Coolidge St NW

Direction	EB	WB	NB	SB	All
Future Volume (vph)	8	15	1059	623	1705
Control Delay / Veh (s/v)	56	24	0	0	1
Queue Delay / Veh (s/v)	0	0	0	0	0
Total Delay / Veh (s/v)	56	24	0	0	1
Total Delay (hr)	0	0	0	0	0
Stops / Veh	1.00	1.00	0.02	0.09	0.06
Stops (#)	8	15	24	56	103
Average Speed (mph)	5	11	45	43	43
Total Travel Time (hr)	0	0	5	2	7
Distance Traveled (mi)	1	2	208	95	305
Fuel Consumed (gal)	0	0	7	4	12
Fuel Economy (mpg)	NA	NA	27.9	23.7	25.8
CO Emissions (kg)	0.01	0.02	0.52	0.28	0.83
NOx Emissions (kg)	0.00	0.00	0.10	0.05	0.16
VOC Emissions (kg)	0.00	0.00	0.12	0.07	0.19
Unserved Vehicles (#)	0	0	0	0	0
Vehicles in dilemma zone (#)	0	0	0	0	0

9: TH 47 & Wilson St

Direction	WB	NB	SB	All
Future Volume (vph)	3	1076	640	1719
Control Delay / Veh (s/v)	54	0	0	0
Queue Delay / Veh (s/v)	0	0	0	0
Total Delay / Veh (s/v)	54	0	0	0
Total Delay (hr)	0	0	0	0
Stops / Veh	1.00	0.02	0.02	0.02
Stops (#)	3	25	12	40
Average Speed (mph)	6	44	45	44
Total Travel Time (hr)	0	2	3	4
Distance Traveled (mi)	0	71	126	197
Fuel Consumed (gal)	0	3	4	7
Fuel Economy (mpg)	NA	25.6	28.1	27.0
CO Emissions (kg)	0.00	0.19	0.31	0.51
NOx Emissions (kg)	0.00	0.04	0.06	0.10
VOC Emissions (kg)	0.00	0.05	0.07	0.12
Unserved Vehicles (#)	0	0	0	0
Vehicles in dilemma zone (#)	0	0	0	0

Detailed Measures of Effectiveness

03/17/2020

13: TH 47 & Dunham Dr

Direction	WB	NB	SB	All
Future Volume (vph)	2	1077	636	1715
Control Delay / Veh (s/v)	36	0	0	0
Queue Delay / Veh (s/v)	0	0	0	0
Total Delay / Veh (s/v)	36	0	0	0
Total Delay (hr)	0	0	0	0
Stops / Veh	1.00	0.00	0.00	0.00
Stops (#)	2	0	0	2
Average Speed (mph)	9	45	45	45
Total Travel Time (hr)	0	2	1	3
Distance Traveled (mi)	0	75	42	117
Fuel Consumed (gal)	0	3	1	4
Fuel Economy (mpg)	NA	29.2	29.2	29.0
CO Emissions (kg)	0.00	0.18	0.10	0.28
NOx Emissions (kg)	0.00	0.03	0.02	0.05
VOC Emissions (kg)	0.00	0.04	0.02	0.07
Unserved Vehicles (#)	0	0	0	0
Vehicles in dilemma zone (#)	0	0	0	0

15: TH 47 & McCann Ave

Direction	WB	NB	SB	All
Future Volume (vph)	6	1086	637	1729
Control Delay / Veh (s/v)	55	0	0	0
Queue Delay / Veh (s/v)	0	0	0	0
Total Delay / Veh (s/v)	55	0	0	0
Total Delay (hr)	0	0	0	0
Stops / Veh	1.00	0.00	0.02	0.01
Stops (#)	6	0	12	18
Average Speed (mph)	7	45	45	44
Total Travel Time (hr)	0	3	1	4
Distance Traveled (mi)	1	116	44	161
Fuel Consumed (gal)	0	4	2	6
Fuel Economy (mpg)	NA	29.2	26.4	27.8
CO Emissions (kg)	0.01	0.28	0.12	0.40
NOx Emissions (kg)	0.00	0.05	0.02	0.08
VOC Emissions (kg)	0.00	0.06	0.03	0.09
Unserved Vehicles (#)	0	0	0	0
Vehicles in dilemma zone (#)	0	0	0	0

Detailed Measures of Effectiveness

03/17/2020

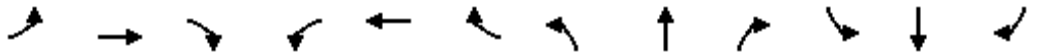
16: TH 47 & McKinley St

Direction	EB	WB	NB	SB	All
Future Volume (vph)	124	5	1276	641	2046
Control Delay / Veh (s/v)	21	134	7	0	6
Queue Delay / Veh (s/v)	0	0	0	0	0
Total Delay / Veh (s/v)	21	134	7	0	6
Total Delay (hr)	1	0	2	0	3
Stops / Veh	1.00	1.00	1.41	0.02	0.95
Stops (#)	124	5	1796	12	1937
Average Speed (mph)	14	3	32	45	31
Total Travel Time (hr)	1	0	9	2	12
Distance Traveled (mi)	18	1	282	68	368
Fuel Consumed (gal)	2	0	34	3	38
Fuel Economy (mpg)	9.2	NA	8.3	27.3	9.6
CO Emissions (kg)	0.14	0.01	2.36	0.17	2.69
NOx Emissions (kg)	0.03	0.00	0.46	0.03	0.52
VOC Emissions (kg)	0.03	0.00	0.55	0.04	0.62
Unserved Vehicles (#)	0	0	0	0	0
Vehicles in dilemma zone (#)	0	0	0	0	0

Network Totals

Number of Intersections	5
Control Delay / Veh (s/v)	2
Queue Delay / Veh (s/v)	0
Total Delay / Veh (s/v)	2
Total Delay (hr)	4
Stops / Veh	0.24
Stops (#)	2100
Average Speed (mph)	39
Total Travel Time (hr)	30
Distance Traveled (mi)	1149
Fuel Consumed (gal)	67
Fuel Economy (mpg)	17.0
CO Emissions (kg)	4.71
NOx Emissions (kg)	0.92
VOC Emissions (kg)	1.09
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	0
Performance Index	9.8

Lanes, Volumes, Timings
6: TH 47 & E Mineral Pond Blvd/Coolidge St NW 03/17/2020



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	4	0	0	14	0	1052	5	0	615	8
Future Volume (vph)	0	0	4	0	0	14	0	1052	5	0	615	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		125	0		225
Storage Lanes	0		1	0		1	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.865			0.865			0.850			0.850
Flt Protected												
Satd. Flow (prot)	0	0	1611	0	0	1611	0	1863	1583	0	1863	1583
Flt Permitted												
Satd. Flow (perm)	0	0	1611	0	0	1611	0	1863	1583	0	1863	1583
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		468			597			1037			816	
Travel Time (s)		10.6			13.6			15.7			12.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	4	0	0	15	0	1143	5	0	668	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	4	0	0	15	0	1143	5	0	668	9
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 65.4%		ICU Level of Service C	
Analysis Period (min) 15			

Lanes, Volumes, Timings
9: TH 47 & Wilson St

03/17/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	0	3	0	2	6	1056	17	13	634	3
Future Volume (vph)	5	0	0	3	0	2	6	1056	17	13	634	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	125		125	125		125
Storage Lanes	0		0	0		0	1		1	1		1
Taper Length (ft)	25			25			180			180		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.946				0.850			0.850
Flt Protected		0.950			0.971		0.950			0.950		
Satd. Flow (prot)	0	1770	0	0	1711	0	1770	1863	1583	1770	1863	1583
Flt Permitted		0.950			0.971		0.950			0.950		
Satd. Flow (perm)	0	1770	0	0	1711	0	1770	1863	1583	1770	1863	1583
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		665			592			1277			1037	
Travel Time (s)		15.1			13.5			19.3			15.7	
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)	5	0	0	3	0	2	7	1148	18	14	689	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	5	0	0	5	0	7	1148	18	14	689	3
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								Yes				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

Lanes, Volumes, Timings
16: TH 47 & McKinley St

03/17/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	122	9	0	3	173	1073	30	3	622	10
Future Volume (vph)	2	0	122	9	0	3	173	1073	30	3	622	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	110		0	110		0	275		275	250		125
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	120			120			180			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.850				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1583	0	1770	1583	0	1770	1863	1583	1770	1863	1583
Flt Permitted	0.756			0.635			0.372			0.143		
Satd. Flow (perm)	1408	1583	0	1183	1583	0	693	1863	1583	266	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		311			121				33			18
Link Speed (mph)		30			30			45			45	
Link Distance (ft)		770			600			1165			1277	
Travel Time (s)		17.5			13.6			17.7			19.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	0	133	10	0	3	188	1166	33	3	676	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	2	133	0	10	3	0	188	1166	33	3	676	11
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane								Yes			Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6

Lanes, Volumes, Timings
16: TH 47 & McKinley St

03/17/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5		22.5	22.5		22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	22.5	22.5		22.5	22.5		67.5	67.5	67.5	67.5	67.5	67.5
Total Split (%)	25.0%	25.0%		25.0%	25.0%		75.0%	75.0%	75.0%	75.0%	75.0%	75.0%
Maximum Green (s)	18.0	18.0		18.0	18.0		63.0	63.0	63.0	63.0	63.0	63.0
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	Min
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	6.3	6.3		6.3	6.3		53.4	53.4	53.4	53.4	53.4	53.4
Actuated g/C Ratio	0.09	0.09		0.09	0.09		0.78	0.78	0.78	0.78	0.78	0.78
v/c Ratio	0.02	0.31		0.09	0.01		0.35	0.81	0.03	0.01	0.47	0.01
Control Delay	32.0	1.9		33.9	0.0		4.4	10.2	0.7	2.0	3.9	0.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.0	1.9		33.9	0.0		4.4	10.2	0.7	2.0	3.9	0.6
LOS	C	A		C	A		A	B	A	A	A	A
Approach Delay		2.3			26.1			9.2			3.8	
Approach LOS		A			C			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 68.9			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 7.2		Intersection LOS: A	
Intersection Capacity Utilization 79.4%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 16: TH 47 & McKinley St

Measures of Effectiveness

03/17/2020

Network Totals

Number of Intersections	3
Total Delay (hr)	4
Stops (#)	910
Average Speed (mph)	38
Total Travel Time (hr)	30
Distance Traveled (mi)	1150
Fuel Consumed (gal)	54
Fuel Economy (mpg)	21.4
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	119
Performance Index	6.9

Detailed Measures of Effectiveness

03/17/2020

6: TH 47 & E Mineral Pond Blvd/Coolidge St NW

Direction	EB	WB	NB	SB	All
Future Volume (vph)	4	14	1057	623	1698
Control Delay / Veh (s/v)	13	21	0	0	0
Queue Delay / Veh (s/v)	0	0	0	0	0
Total Delay / Veh (s/v)	13	21	0	0	0
Total Delay (hr)	0	0	0	0	0
Stops / Veh	1.00	1.00	0.00	0.00	0.01
Stops (#)	4	14	0	0	18
Average Speed (mph)	14	12	45	45	44
Total Travel Time (hr)	0	0	5	2	7
Distance Traveled (mi)	0	2	208	96	306
Fuel Consumed (gal)	0	0	7	3	11
Fuel Economy (mpg)	NA	NA	29.2	29.2	28.7
CO Emissions (kg)	0.00	0.01	0.50	0.23	0.75
NOx Emissions (kg)	0.00	0.00	0.10	0.04	0.15
VOC Emissions (kg)	0.00	0.00	0.12	0.05	0.17
Unserved Vehicles (#)	0	0	0	0	0
Vehicles in dilemma zone (#)	0	0	0	0	0

9: TH 47 & Wilson St

Direction	EB	WB	NB	SB	All
Future Volume (vph)	5	5	1079	650	1739
Control Delay / Veh (s/v)	29	25	0	0	0
Queue Delay / Veh (s/v)	0	0	0	0	0
Total Delay / Veh (s/v)	29	25	0	0	0
Total Delay (hr)	0	0	0	0	0
Stops / Veh	1.00	1.00	0.01	0.06	0.04
Stops (#)	5	5	11	41	62
Average Speed (mph)	10	10	45	44	44
Total Travel Time (hr)	0	0	6	3	9
Distance Traveled (mi)	1	1	261	128	390
Fuel Consumed (gal)	0	0	9	5	14
Fuel Economy (mpg)	NA	NA	28.7	25.9	27.5
CO Emissions (kg)	0.01	0.01	0.64	0.34	0.99
NOx Emissions (kg)	0.00	0.00	0.12	0.07	0.19
VOC Emissions (kg)	0.00	0.00	0.15	0.08	0.23
Unserved Vehicles (#)	0	0	0	0	0
Vehicles in dilemma zone (#)	0	0	0	0	0

Detailed Measures of Effectiveness

03/17/2020

16: TH 47 & McKinley St

Direction	EB	WB	NB	SB	All
Future Volume (vph)	124	12	1276	635	2047
Control Delay / Veh (s/v)	2	25	9	4	7
Queue Delay / Veh (s/v)	0	0	0	0	0
Total Delay / Veh (s/v)	2	25	9	4	7
Total Delay (hr)	0	0	3	1	4
Stops / Veh	0.02	1.00	0.50	0.29	0.41
Stops (#)	3	12	634	181	830
Average Speed (mph)	26	10	30	38	31
Total Travel Time (hr)	1	0	10	4	14
Distance Traveled (mi)	18	1	282	154	455
Fuel Consumed (gal)	1	0	20	8	29
Fuel Economy (mpg)	NA	NA	14.1	19.2	15.7
CO Emissions (kg)	0.06	0.01	1.39	0.56	2.02
NOx Emissions (kg)	0.01	0.00	0.27	0.11	0.39
VOC Emissions (kg)	0.01	0.00	0.32	0.13	0.47
Unserved Vehicles (#)	0	0	0	0	0
Vehicles in dilemma zone (#)	0	0	77	42	119

Network Totals

Number of Intersections	3
Control Delay / Veh (s/v)	3
Queue Delay / Veh (s/v)	0
Total Delay / Veh (s/v)	3
Total Delay (hr)	4
Stops / Veh	0.17
Stops (#)	910
Average Speed (mph)	38
Total Travel Time (hr)	30
Distance Traveled (mi)	1150
Fuel Consumed (gal)	54
Fuel Economy (mpg)	21.4
CO Emissions (kg)	3.76
NOx Emissions (kg)	0.73
VOC Emissions (kg)	0.87
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	119
Performance Index	6.9

MNTH 47 2016-2018 Crash Data

objectid	Incident ID	Date and Time	Crash Severity	Number Killed	Number of Vehicles	Officer Narrative	Manner of Collision	Traffic Control Device	Unit1 Type	Unit1 Vehicle Type	Unit1 Direction
1972441	377842	9/9/2016, 12:00 PM	Property Damage Only Crash	0	3	Vehicles #1 and #2 were stopped in the left turn lane of n/b	Angle	Other	Motor Vehicle in Transport	Passenger Car	Northbound
1874910	383676	9/30/2016, 12:12 PM	Property Damage Only Crash	0	2	Dr 2 was slowing in traffic and coming to a stop and dr 1 did	Front to Rear	No Controls	Motor Vehicle in Transport	Passenger Car	Northbound
2075891	381196	9/15/2016, 2:35 PM	Property Damage Only Crash	0	2	UNIT 1 AND UNIT 2 BOTH NORTH ON HWY 47 APPROACHIN	Front to Rear	No Controls	Motor Vehicle in Transport	Sport Utility Vehicle	Northbound
1952900	372920	8/19/2016, 5:17 PM	Property Damage Only Crash	0	2	DV2 STATED SHE WAS STOPPED IN TRAFFIC WAITING FOR T	Front to Rear	Not Applicable	Motor Vehicle in Transport		Southbound
2391716	372122	8/16/2016, 1:33 PM	Property Damage Only Crash	0	2	DR 2 WAS STOPPED AND GOING TO MAKE LEFT TURN INTO	Front to Rear	No Controls	Motor Vehicle in Transport	Passenger Van	Northbound
2338868	370722	8/11/2016, 7:49 AM	Property Damage Only Crash	0	2	DV2 STATED HE WAS SLOWING IN TRAFFIC WHEN HE WAS F	Front to Rear	Not Applicable	Motor Vehicle in Transport	Sport Utility Vehicle	Southbound
1816417	362607	7/8/2016, 4:57 PM	Property Damage Only Crash	0	3	pushing unit 2 into unit 1. Unit 3 smelled of alcoholic	Front to Rear	No Controls	Motor Vehicle in Transport	Passenger Car	Northbound
2264310	364253	7/16/2016, 3:56 PM	Minor Injury Crash	0	2	I was dispatched to a personal injury accident car vs motorc	Front to Rear	No Controls	Motor Vehicle in Transport	Passenger Car	Northbound
2389509	351126	5/23/2016, 5:45 PM	Property Damage Only Crash	0	2	Rush hour and cars were backed up. Vehicle 1 was moving f	Front to Rear	No Controls	Motor Vehicle in Transport	Passenger Car	Northbound
2237772	343568	4/20/2016, 4:20 PM	Property Damage Only Crash	0	2	Unit 1 was south bound on ST Francis Blvd in the 3400 block. As	Unit 1 approached McCann	No Controls	Motor Vehicle in Transport	Sport Utility Vehicle	Southbound
2095109	338150	3/25/2016, 1:45 PM	Property Damage Only Crash	0	2	Veh #1 stopped in traffic due vehicle ahead making left han	Front to Rear	No Controls	Motor Vehicle in Transport	Passenger Car	Northbound
2389001	327717	2/9/2016, 11:43 AM	Property Damage Only Crash	0	2	SHE WAS SLOWING FOR TRAFFIC IN FRONT OF HER. SHE	Front to Rear	No Controls	Motor Vehicle in Transport	Passenger Car	Southbound
2363246	333022	2/29/2016, 3:53 PM	Property Damage Only Crash	0	2	Unit 1 was stopped facing southbound on St. Francis Blvd w	Front to Rear	No Controls	Motor Vehicle in Transport	Passenger Car	Southbound
2453716	400543	12/5/2016, 7:00 PM	Property Damage Only Crash	0	2	Vehicle 1 (post office truck #4311187) was travelling s/b on	Other	No Controls	Motor Vehicle in Transport	Other	Southbound
2266825	409895	12/30/2016, 3:39 PM	Property Damage Only Crash	0	2	Unit #1 and Unit #2 were both traveling N/B Ferry Street. Ur	Front to Rear	No Controls	Motor Vehicle in Transport	Passenger Car	Northbound
2050006	388219	10/20/2016, 5:55 PM	Possible Injury Crash	0	2	Unit 1 was stopped in traffic and driver of Unit 2 stated she	Front to Rear	Not Applicable	Motor Vehicle in Transport	Passenger Car	Northbound
1881558	387789	10/18/2016, 3:47 PM	Property Damage Only Crash	0	3	Vehicle designated as #1 was driven by Wever. Vehicle desi	Front to Rear	No Controls	Motor Vehicle in Transport	Pickup	Northbound
1816154	324833	1/31/2016, 4:40 PM	Property Damage Only Crash	0	1	Vehicle 1 was traveling North on St. Francis Blvd/Hwy 47. A	Sideswipe - Same Direction	No Controls	Motor Vehicle in Transport	Passenger Van	Northbound
2161598	505003	9/29/2017, 3:20 PM	Property Damage Only Crash	0	4	UNIT 1 CAME TO A STOP FOR A CAR MAKING A LEFT TURN.	Front to Rear	No Controls	Motor Vehicle in Transport	Passenger Car	Northbound
2133117	457863	6/7/2017, 2:00 PM	Property Damage Only Crash	0	3	UNIT 1, 2, AND 3 NORTH ON HWY 47 APPROACHING MCKIN	Front to Rear	No Controls	Motor Vehicle in Transport	Sport Utility Vehicle	Northbound
2552004	456819	6/3/2017, 10:31 AM	Property Damage Only Crash	0	3	UNIT 1 WAS SB ON HWY 47 STOPPED IN TRAFFIC AT MCKINI	Sideswipe - Same Direction	Stop Sign	Motor Vehicle in Transport	Sport Utility Vehicle	Southbound
2210896	468953	6/11/2017, 5:39 PM	Minor Injury Crash	0	2	UNIT 1 WAS NB ON THE 3500 BLOCK OF HWY 47. UNIT 2 W	Front to Rear	No Controls	Motor Vehicle in Transport	Passenger Car	Northbound
2500376	431304	3/24/2017, 5:15 PM	Property Damage Only Crash	0	1	Unit 1 traveling southbound on St. Francis Blvd. unit 2 trave	Sideswipe - Opposing	No Controls	Motor Vehicle in Transport	Passenger Car	Southbound
2048507	525527	12/15/2017, 5:50 PM	Property Damage Only Crash	0	2	He was in the turn lane to head west on Bunker Lake Blvd	Angle	No Controls	Motor Vehicle in Transport	Passenger Car	Northbound
1830487	515981	11/10/2017, 5:50 PM	Property Damage Only Crash	0	2	UNIT 1 DRIVING NORTH BOUND SAINT FRANCIS BLVD AND \	Front to Rear	No Controls	Motor Vehicle in Transport	Sport Utility Vehicle	Northbound
2527083	507001	10/7/2017, 6:39 PM	Property Damage Only Crash	0	2	UNIT #1 AND UNIT #2 WERE BOTH TRAVELING NORTH ON H	Front to Rear	No Controls	Motor Vehicle in Transport	Passenger Car	Northbound
2423967	509946	10/18/2017, 3:10 PM	Property Damage Only Crash	0	2	BOTH VEHICLES WERE TRAVELLING N/B ON SAINT FRANCIS	Front to Rear	No Controls	Motor Vehicle in Transport	Sport Utility Vehicle	Northbound
2261010	418313	1/23/2017, 3:21 PM	Possible Injury Crash	0	2	dr 1 stated he was s/b on st. francis blvd and the care in fror	Angle	No Controls	Motor Vehicle in Transport	Passenger Van	Southbound
2217170	636238	9/19/2018, 5:55 PM	Minor Injury Crash	0	3	UNIT 1 WAS STOPPED ON SOUTH BOUND ST FRANCIS BLVD	Front to Rear	No Controls	Motor Vehicle in Transport	Passenger Car	Southbound
1778524	634119	9/11/2018, 4:28 PM	Property Damage Only Crash	0	3	UNIT 1 AND UNIT 2 WHERE DRIVING NORTH BOUND FERRY	Front to Rear	No Controls	Motor Vehicle in Transport	Sport Utility Vehicle	Northbound
2026162	628554	8/17/2018, 11:40 PM	Property Damage Only Crash	0	2	TURN LEFT OR W/B ON TO WILSON ST. VEHICLE #2 N/B	Front to Rear	No Controls	Motor Vehicle in Transport	Passenger Car	Northbound
2052149	606266	6/23/2018, 9:55 AM	Property Damage Only Crash	0	1	UNIT 1 TRAVELING NB ON ST FRANCIS BLVD LEFT THE ROADWAY AND COLLIDED INTO A FEN		No Controls	Motor Vehicle in Transport	Passenger Car	Northbound
2506214	598402	5/19/2018, 10:48 AM	Property Damage Only Crash	0	4	ACCIDENT ON SAINT FRANCIS BLVD JUST SOUTH OF	Front to Rear	No Controls	Motor Vehicle in Transport	Passenger Car	Southbound
1856682	593119	4/23/2018, 3:15 PM	Property Damage Only Crash	0	3	Unit 1 was traveling SB St Francis Blvd. Driver of Unit 1 adm	Front to Rear	No Controls	Motor Vehicle in Transport	Passenger Car	Southbound
1784780	543103	2/5/2018, 7:55 AM	Property Damage Only Crash	0	2	UNIT 2 WAS STOPPED/SLOWING IN TRAFFIC FOR RUSH HOU	Front to Rear	No Controls	Motor Vehicle in Transport	Sport Utility Vehicle	Southbound
1915427	662189	11/16/2018, 3:20 PM	Property Damage Only Crash	0	2	UNIT 1 TRAVELLING NORTHBOUND ON SAINT FRANCIS BLVI	Angle	No Controls	Motor Vehicle in Transport	Passenger Van	Northbound
2430456	651004	10/10/2018, 4:03 PM	Property Damage Only Crash	0	1	UNIT 1 WAS STOPPED IN TRAFFIC. UNIT 2 REAR-ENDED UNI	Front to Rear	No Controls	Motor Vehicle in Transport	Passenger Car	Northbound
1915347	651392	10/10/2018, 1:45 PM	Property Damage Only Crash	0	2	UNIT 1 TRAVELLING NORTHBOUND ON SAINT FRANCIS BLVI	Angle	No Controls	Motor Vehicle in Transport	Cargo Van 10,000lbs or Less	Northbound
2291526	541208	1/19/2018, 3:20 PM	Property Damage Only Crash	0	1	=HIT AND RUN. INFO DOES NOT COME BACK ON PENSKE TR	Sideswipe - Same Direction	No Controls	Hit-And-Run Vehicle or Unknown Driver	Passenger Car	Southbound

MNTH 47 2016-2018 Crash Data

Unit1 Factor1	Unit1 Vehicle Maneuver	Unit2 Type	Unit2 Vehicle Type	Unit2 Direction	Unit2 Factor1	Unit2 Vehicle Maneuver
No Clear Contributing Action	Vehicle Stopped or Stalled in Roadway	Motor Vehicle in Transport	Passenger Car	Northbound	No Clear Contributing Action	Vehicle Stopped or Stalled in Roadway
Following Too Closely	Moving Forward	Motor Vehicle in Transport	Passenger Car	Northbound	No Clear Contributing Action	Slowing
No Clear Contributing Action	Slowing	Motor Vehicle in Transport	Passenger Car	Northbound	Unknown	Moving Forward
Driver Distracted	Slowing	Motor Vehicle in Transport	Passenger Car	Southbound	No Clear Contributing Action	Vehicle Stopped or Stalled in Roadway
Other Contributing Action	Moving Forward	Motor Vehicle in Transport	Passenger Van	Northbound	No Clear Contributing Action	Turning Left
Following Too Closely	Moving Forward	Motor Vehicle in Transport	Passenger Car	Southbound	No Clear Contributing Action	Slowing
No Clear Contributing Action	Vehicle Stopped or Stalled in Roadway	Motor Vehicle in Transport	Passenger Car	Northbound	No Clear Contributing Action	Vehicle Stopped or Stalled in Roadway
No Clear Contributing Action	Moving Forward	Motor Vehicle in Transport	Motorcycle	Northbound	No Clear Contributing Action	Turning Left
No Clear Contributing Action	Moving Forward	Motor Vehicle in Transport	Pickup	Northbound	No Clear Contributing Action	Moving Forward
No Clear Contributing Action	Swerved or Attempt to Avoid Object in Roadway	Motor Vehicle in Transport	Passenger Van	Southbound	Failure to Yield Right-of-Way	Turning Left
No Clear Contributing Action	Vehicle Stopped or Stalled in Roadway	Motor Vehicle in Transport	Passenger Car	Northbound	Operated Motor Vehicle in Careless, Negligent, or Erratic Manner	Moving Forward
No Clear Contributing Action	Slowing	Motor Vehicle in Transport	Sport Utility Vehicle	Southbound	Driver Distracted	Moving Forward
No Clear Contributing Action	Vehicle Stopped or Stalled in Roadway	Motor Vehicle in Transport	Passenger Car	Southbound	Unknown	Moving Forward
No Clear Contributing Action	Moving Forward	Motor Vehicle in Transport	Sport Utility Vehicle	Eastbound	Unknown	Turning Left
No Clear Contributing Action	Moving Forward	Motor Vehicle in Transport	Passenger Car	Northbound	No Clear Contributing Action	Moving Forward
No Clear Contributing Action	Vehicle Stopped or Stalled in Roadway	Motor Vehicle in Transport	Passenger Van	Northbound	Driver Distracted	Moving Forward
Driver Distracted	Moving Forward	Motor Vehicle in Transport	Pickup	Northbound	No Clear Contributing Action	Vehicle Stopped or Stalled in Roadway
No Clear Contributing Action	Moving Forward	Hit-And-Run Vehicle or Unknown Driver	Passenger Car	Northbound		Overtaking/Passing
No Clear Contributing Action	Vehicle Stopped or Stalled in Roadway	Motor Vehicle in Transport	Passenger Car	Northbound	No Clear Contributing Action	Vehicle Stopped or Stalled in Roadway
No Clear Contributing Action	Slowing	Motor Vehicle in Transport	Passenger Car	Northbound	No Clear Contributing Action	Slowing
No Clear Contributing Action	Vehicle Stopped or Stalled in Roadway	Motor Vehicle in Transport	Sport Utility Vehicle	Northbound	No Clear Contributing Action	Turning Left
Following Too Closely	Moving Forward	Motor Vehicle in Transport	Passenger Car	Northbound	No Clear Contributing Action	Slowing
No Clear Contributing Action	Moving Forward	Hit-And-Run Vehicle or Unknown Driver	Passenger Car	Northbound		Wrong Way into Opposing Traffic
No Clear Contributing Action	Moving Forward	Motor Vehicle in Transport	Sport Utility Vehicle	Westbound	Failure to Yield Right-of-Way	Turning Right
No Clear Contributing Action	Slowing	Motor Vehicle in Transport	Sport Utility Vehicle	Northbound	No Clear Contributing Action	Moving Forward
No Clear Contributing Action	Moving Forward	Motor Vehicle in Transport	Pickup	Northbound	No Clear Contributing Action	Slowing
No Clear Contributing Action	Moving Forward	Motor Vehicle in Transport	Passenger Car	Northbound	No Clear Contributing Action	Moving Forward
Improper Turn/Merge	Turning Left	Motor Vehicle in Transport	Passenger Car	Southbound	No Clear Contributing Action	Moving Forward
No Clear Contributing Action	Turning Left	Motor Vehicle in Transport	Passenger Car	Southbound	No Clear Contributing Action	Slowing
No Clear Contributing Action	Vehicle Stopped or Stalled in Roadway	Motor Vehicle in Transport	Passenger Car	Northbound	No Clear Contributing Action	Vehicle Stopped or Stalled in Roadway
No Clear Contributing Action	Turning Left	Motor Vehicle in Transport	Sport Utility Vehicle	Northbound	Following Too Closely	Moving Forward
Unknown	Moving Forward					
Operated Motor Vehicle in Careless, Negligent, or Erratic Manner	Moving Forward	Motor Vehicle in Transport	Sport Utility Vehicle	Southbound	No Clear Contributing Action	Moving Forward
Driver Distracted	Moving Forward	Motor Vehicle in Transport	Sport Utility Vehicle	Southbound	No Clear Contributing Action	Vehicle Stopped or Stalled in Roadway
Driver Distracted	Slowing	Motor Vehicle in Transport	Sport Utility Vehicle	Southbound	No Clear Contributing Action	Slowing
No Clear Contributing Action	Moving Forward	Motor Vehicle in Transport	Passenger Car	Westbound	No Clear Contributing Action	Turning Right
No Clear Contributing Action	Vehicle Stopped or Stalled in Roadway	Hit-And-Run Vehicle or Unknown Driver	Passenger Van	Northbound		Moving Forward
No Clear Contributing Action	Moving Forward	Motor Vehicle in Transport	Sport Utility Vehicle	Westbound	No Clear Contributing Action	Turning Right
		Motor Vehicle in Transport	Passenger Car	Southbound	No Clear Contributing Action	Moving Forward

MNTH 47 2016-2018 Crash Data

Unit3 Type	Unit3 Vehicle Type	Unit3 Direction	Unit3 Factor1	Unit3 Vehicle Maneuver	Unit4 Type	Unit4 Vehicle Type	Unit4 Direction	Unit4 Factor1	Unit4 Vehicle Maneuver
Motor Vehicle in Transport	Pickup	Northbound	Operated Motor Vehicle in Careless, Negligent, or Erratic Manner	Entering Traffic Lane					
Motor Vehicle in Transport	Sport Utility Vehicle	Northbound	No Clear Contributing Action	Moving Forward					
Motor Vehicle in Transport	Passenger Car	Northbound	No Clear Contributing Action	Vehicle Stopped or Stalled in Roadway					
Motor Vehicle in Transport	Pickup	Northbound	No Clear Contributing Action	Vehicle Stopped or Stalled in Roadway	Motor Vehicle in Transport	Passenger Car	Northbound	No Clear Contributing Action	Slowing
Motor Vehicle in Transport	Sport Utility Vehicle	Northbound	Unknown	Moving Forward					
Motor Vehicle in Transport	Passenger Car	Northbound	Passing on Shoulder	Overtaking/Passing					
Motor Vehicle in Transport	Sport Utility Vehicle	Southbound	Following Too Closely	Moving Forward					
Motor Vehicle in Transport	Pickup	Northbound	No Clear Contributing Action	Moving Forward					
Motor Vehicle in Transport	Sport Utility Vehicle	Southbound	No Clear Contributing Action	Moving Forward	Motor Vehicle in Transport	Pickup	Southbound	No Clear Contributing Action	Moving Forward
Motor Vehicle in Transport	Pickup	Southbound	No Clear Contributing Action	Vehicle Stopped or Stalled in Roadway					

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route	TH 47	**District**	Metro	**County**	Anoka
Begin RP	600 ft S of Xkimo St	**End RP**	Coolidge St NW	**Miles**	0.7 mile
Location	TH 47 from 600 ft south of Xkimo St to Collidge St NW				

B. Project Description

Proposed Work	Install center turn lane, signalized intersection, access restrictions, reconstruct shared use path		
Project Cost*	$4,905,000	**Installation Year**	2024
Project Service Life	20 years	**Traffic Growth Factor**	0.7%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

	Fatal (K) Crashes	**Reference**	*SEE OTHER ATTACHED B-C WORKSHEETS
	Serious Injury (A) Crashes		
	Moderate Injury (B) Crashes	**Crash Type**	
	Possible Injury (C) Crashes		
	Property Damage Only Crashes		www.CMFclearinghouse.org

D. Crash Modification Factor (optional second CMF)

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

E. Crash Data

Begin Date	1/1/2016	**End Date**	12/31/2018	3 years
Data Source	MnDOT			

Crash Severity	**< enter target crashes >**	**< optional 2nd CMF >**
K crashes		
A crashes		
B crashes		
C crashes		
PDO crashes		

F. Benefit-Cost Calculation

$3,070,606	**Benefit (present value)**
$4,905,000	**Cost**

B/C Ratio = 0.63

Proposed project expected to reduce 6 crashes annually, 0 of which involving fatality or serious injury.

F. Analysis Assumptions

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

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

Real Discount Rate	1.2%
Traffic Growth Rate	0.7%
Project Service Life	20 years

G. Annual Benefit

Crash Severity	Crash Reduction	Annual Reduction	Annual Benefit
K crashes	0.00	0.00	$0
A crashes	0.00	0.00	$0
B crashes	1.16	0.39	$81,270
C crashes	0.70	0.23	$25,703
PDO crashes	13.47	4.49	$53,888
			$160,861

H. Amortized Benefit

Year	Crash Benefits	Present Value
2024	$160,861	$160,861
2025	$161,987	$160,067
2026	$163,121	$159,276
2027	$164,263	$158,489
2028	$165,413	$157,706
2029	$166,571	$156,927
2030	$167,737	$156,151
2031	$168,911	$155,380
2032	$170,093	$154,612
2033	$171,284	$153,848
2034	$172,483	$153,088
2035	$173,690	$152,332
2036	$174,906	$151,579
2037	$176,131	$150,830
2038	$177,364	$150,085
2039	$178,605	$149,343
2040	$179,855	$148,606
2041	$181,114	$147,871
2042	$182,382	$147,141
2043	$183,659	$146,414
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0

Total = $3,070,606

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route	TH 47	**District**	Metro	**County**	Anoka
Begin RP	600 ft S of Xkimo St	**End RP**	Coolidge St NW	**Miles**	0.7 mile
Location	TH 47 from 600 ft south of Xkimo St to Collidge St NW				

B. Project Description

Proposed Work	Install center turn lane		
Project Cost*		**Installation Year**	2024
Project Service Life	20 years	**Traffic Growth Factor**	0.7%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

0.69	**Fatal (K) Crashes**	**Reference**	CMF ID: 2338
0.69	**Serious Injury (A) Crashes**		
0.69	**Moderate Injury (B) Crashes**	**Crash Type**	All
0.69	**Possible Injury (C) Crashes**		
0.69	**Property Damage Only Crashes**		www.CMFclearinghouse.org

D. Crash Modification Factor (optional second CMF)

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

E. Crash Data

Begin Date	1/1/2016	**End Date**	12/31/2018	3 years
Data Source	MnDOT			

Crash Severity	**All**	**< optional 2nd CMF >**
K crashes	0	
A crashes	0	
B crashes	0	
C crashes	1	
PDO crashes	8	

F. Benefit-Cost Calculation

$411,574	**Benefit (present value)**	**B/C Ratio = N/A**
$0	**Cost**	

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

F. Analysis Assumptions

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

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

Real Discount Rate 1.2%

Traffic Growth Rate 0.7%

Project Service Life 20 years

G. Annual Benefit

Crash Severity	Crash Reduction	Annual Reduction	Annual Benefit
K crashes	0.00	0.00	$0
A crashes	0.00	0.00	$0
B crashes	0.00	0.00	$0
C crashes	0.31	0.10	$11,513
PDO crashes	2.51	0.84	$10,048
			$21,561

H. Amortized Benefit

Year	Crash Benefits	Present Value
2024	$21,561	$21,561
2025	$21,712	$21,455
2026	$21,864	$21,349
2027	$22,017	$21,243
2028	$22,171	$21,138
2029	$22,327	$21,034
2030	$22,483	$20,930
2031	$22,640	$20,827
2032	$22,799	$20,724
2033	$22,958	$20,621
2034	$23,119	$20,519
2035	$23,281	$20,418
2036	$23,444	$20,317
2037	$23,608	$20,217
2038	$23,773	$20,117
2039	$23,940	$20,018
2040	$24,107	$19,919
2041	$24,276	$19,820
2042	$24,446	$19,722
2043	$24,617	$19,625
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0

Total = $411,574

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route	TH 47	**District**	Metro	**County**	Anoka
Begin RP	600 ft S of Xkimo St	**End RP**	Coolidge St NW	**Miles**	0.7 mile
Location	TH 47 from 600 ft south of Xkimo St to Collidge St NW				

B. Project Description

Proposed Work	Install center turn lane		
Project Cost*		**Installation Year**	2024
Project Service Life	20 years	**Traffic Growth Factor**	0.7%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

0.61	**Fatal (K) Crashes**	**Reference**	CMF ID: 2351
0.61	**Serious Injury (A) Crashes**		
0.61	**Moderate Injury (B) Crashes**	**Crash Type**	Rear End
0.61	**Possible Injury (C) Crashes**		
0.61	**Property Damage Only Crashes**		www.CMFclearinghouse.org

D. Crash Modification Factor (optional second CMF)

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

E. Crash Data

Begin Date 1/1/2016 **End Date** 12/31/2018 3 years

Data Source MnDOT

Crash Severity	Rear End	< optional 2nd CMF >
K crashes	0	
A crashes	0	
B crashes	3	
C crashes	1	
PDO crashes	23	

F. Benefit-Cost Calculation

$2,507,086	**Benefit (present value)**	**B/C Ratio = N/A**
$0	**Cost**	

Proposed project expected to reduce 4 crashes annually, 0 of which involving fatality or serious injury.

F. Analysis Assumptions

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

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

Real Discount Rate	1.2%
Traffic Growth Rate	0.7%
Project Service Life	20 years

G. Annual Benefit

Crash Severity	Crash Reduction	Annual Reduction	Annual Benefit
K crashes	0.00	0.00	$0
A crashes	0.00	0.00	$0
B crashes	1.16	0.39	$81,270
C crashes	0.39	0.13	$14,190
PDO crashes	8.97	2.99	$35,880
			$131,340

H. Amortized Benefit

Year	Crash Benefits	Present Value
2024	$131,340	$131,340
2025	$132,259	$130,691
2026	$133,185	$130,045
2027	$134,117	$129,403
2028	$135,056	$128,764
2029	$136,002	$128,127
2030	$136,954	$127,494
2031	$137,912	$126,864
2032	$138,878	$126,238
2033	$139,850	$125,614
2034	$140,829	$124,993
2035	$141,815	$124,376
2036	$142,807	$123,761
2037	$143,807	$123,150
2038	$144,814	$122,541
2039	$145,827	$121,936
2040	$146,848	$121,333
2041	$147,876	$120,734
2042	$148,911	$120,137
2043	$149,954	$119,544
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0

Total = $2,507,086

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route	TH 47	**District**	Metro	**County**	Anoka
Begin RP	600 ft S of Xkimo St	**End RP**	Coolidge St NW	**Miles**	0.7 mile
Location	TH 47 at Collidge St NW				

B. Project Description

Proposed Work	Install right-in/right-out		
Project Cost*		**Installation Year**	2024
Project Service Life	20 years	**Traffic Growth Factor**	0.7%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

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

D. Crash Modification Factor (optional second CMF)

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

E. Crash Data

Begin Date	1/1/2016	**End Date**	12/31/2018	3 years
Data Source	MnDOT			

Crash Severity	**All**	**< optional 2nd CMF >**
K crashes	0	
A crashes	0	
B crashes	0	
C crashes	0	
PDO crashes	1	

F. Benefit-Cost Calculation

$34,360	**Benefit (present value)**	**B/C Ratio = N/A**
$0	**Cost**	

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

F. Analysis Assumptions

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

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

Real Discount Rate 1.2%

Traffic Growth Rate 0.7%

Project Service Life 20 years

G. Annual Benefit

Crash Severity	Crash Reduction	Annual Reduction	Annual Benefit
K crashes	0.00	0.00	$0
A crashes	0.00	0.00	$0
B crashes	0.00	0.00	$0
C crashes	0.00	0.00	$0
PDO crashes	0.45	0.15	$1,800
			$1,800

H. Amortized Benefit

Year	Crash Benefits	Present Value
2024	$1,800	$1,800
2025	$1,813	$1,791
2026	$1,825	$1,782
2027	$1,838	$1,773
2028	$1,851	$1,765
2029	$1,864	$1,756
2030	$1,877	$1,747
2031	$1,890	$1,739
2032	$1,903	$1,730
2033	$1,917	$1,722
2034	$1,930	$1,713
2035	$1,944	$1,705
2036	$1,957	$1,696
2037	$1,971	$1,688
2038	$1,985	$1,679
2039	$1,999	$1,671
2040	$2,013	$1,663
2041	$2,027	$1,655
2042	$2,041	$1,646
2043	$2,055	$1,638
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0

Total = $34,360

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route	TH 47	**District**	Metro	**County**	Anoka
Begin RP	600 ft S of Xkimo St	**End RP**	Coolidge St NW	**Miles**	0.7 mile
Location	TH 47 at McKinley St				

B. Project Description

Proposed Work	Install signalized intersection with left turn lanes on all approaches		
Project Cost*		**Installation Year**	2024
Project Service Life	20 years	**Traffic Growth Factor**	0.7%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

0.23	**Fatal (K) Crashes**	**Reference**	CMF ID: 326
0.23	**Serious Injury (A) Crashes**		
0.23	**Moderate Injury (B) Crashes**	**Crash Type**	Angle
0.23	**Possible Injury (C) Crashes**		
0.23	**Property Damage Only Crashes**		www.CMFclearinghouse.org

D. Crash Modification Factor (optional second CMF)

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

E. Crash Data

Begin Date	1/1/2016	**End Date**	12/31/2018	3 years
Data Source	MnDOT			

Crash Severity	Angle	< optional 2nd CMF >
K crashes	0	
A crashes	0	
B crashes	0	
C crashes	0	
PDO crashes	2	

F. Benefit-Cost Calculation

$117,586	**Benefit (present value)**	**B/C Ratio = N/A**
$0	**Cost**	

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

F. Analysis Assumptions

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

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

Real Discount Rate 1.2%

Traffic Growth Rate 0.7%

Project Service Life 20 years

G. Annual Benefit

Crash Severity	Crash Reduction	Annual Reduction	Annual Benefit
K crashes	0.00	0.00	$0
A crashes	0.00	0.00	$0
B crashes	0.00	0.00	$0
C crashes	0.00	0.00	$0
PDO crashes	1.54	0.51	$6,160
			$6,160

H. Amortized Benefit

Year	Crash Benefits	Present Value
2024	$6,160	$6,160
2025	$6,203	$6,130
2026	$6,247	$6,099
2027	$6,290	$6,069
2028	$6,334	$6,039
2029	$6,379	$6,009
2030	$6,423	$5,980
2031	$6,468	$5,950
2032	$6,514	$5,921
2033	$6,559	$5,891
2034	$6,605	$5,862
2035	$6,651	$5,833
2036	$6,698	$5,805
2037	$6,745	$5,776
2038	$6,792	$5,747
2039	$6,839	$5,719
2040	$6,887	$5,691
2041	$6,936	$5,663
2042	$6,984	$5,635
2043	$7,033	$5,607
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0

Total = $117,586

CMF / CRF Details

CMF ID: 2338

Install TWLTL (two-way left turn lane) on two lane road

Description:

Prior Condition: ***No Prior Condition(s)***

Category: Roadway

Study: ***Safety Evaluation of Installing Center Two-Way Left-Turn Lanes on Two-Lane Roads*****, Lyon et al., 2008**

Star Quality Rating:	[View score details]

Crash Modification Factor (CMF)	
Value:	0.686
Adjusted Standard Error:	
Unadjusted Standard Error:	0.057

Crash Reduction Factor (CRF)	
Value:	31.4 *(This value indicates a* ***decrease*** *in crashes)*
Adjusted Standard Error:	

Unadjusted Standard Error:	5.7

Applicability

Crash Type:	All
Crash Severity:	All
Roadway Types:	Not Specified
Number of Lanes:	2
Road Division Type:	Divided by TWLTL
Speed Limit:	
Area Type:	All
Traffic Volume:	
Time of Day:	All

If countermeasure is intersection-based

Intersection Type:	
Intersection Geometry:	
Traffic Control:	
Major Road Traffic Volume:	
Minor Road Traffic Volume:	

Development Details

Date Range of Data Used:	1991 to 2004
Municipality:	
State:	CA

Country:	
Type of Methodology Used:	Before/after using empirical Bayes or full Bayes
Sample Size Used:	Mile-years
Before Sample Size Used:	89 Mile-years
After Sample Size Used:	89 Mile-years

Other Details

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

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CMF / CRF Details

CMF ID: 2351

Install TWLTL (two-way left turn lane) on two lane road

Description:

Prior Condition: ***No Prior Condition(s)***

Category: Roadway

Study: ***Safety Evaluation of Installing Center Two-Way Left-Turn Lanes on Two-Lane Roads*****, Lyon et al., 2008**

Star Quality Rating:	★★★★★ [View score details]

Crash Modification Factor (CMF)	
Value:	0.613
Adjusted Standard Error:	
Unadjusted Standard Error:	0.04

Crash Reduction Factor (CRF)	
Value:	38.7 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	

Unadjusted Standard Error:	4

Applicability

Crash Type:	Rear end
Crash Severity:	All
Roadway Types:	Not Specified
Number of Lanes:	2
Road Division Type:	Divided by TWLTL
Speed Limit:	
Area Type:	All
Traffic Volume:	
Time of Day:	All

If countermeasure is intersection-based

Intersection Type:	
Intersection Geometry:	
Traffic Control:	
Major Road Traffic Volume:	
Minor Road Traffic Volume:	

Development Details

Date Range of Data Used:	1990 to 2004
Municipality:	
State:	AR, CA, IL, NC

Country:	
Type of Methodology Used:	Before/after using empirical Bayes or full Bayes
Sample Size Used:	Mile-years
Before Sample Size Used:	582 Mile-years
After Sample Size Used:	582 Mile-years

Other Details

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

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CMF / CRF Details

CMF ID: 9821

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

Description:

Prior Condition: ***No Prior Condition(s)***

Category: Access management

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

Star Quality Rating:	★★★★☆ [View score details]

Crash Modification Factor (CMF)	
Value:	0.55
Adjusted Standard Error:	
Unadjusted Standard Error:	0.09

Crash Reduction Factor (CRF)	
Value:	45 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	

Unadjusted Standard Error:	9

Applicability

Crash Type:	All
Crash Severity:	All
Roadway Types:	Not specified
Number of Lanes:	4 and 6
Road Division Type:	Divided by Median
Speed Limit:	
Area Type:	Urban
Traffic Volume:	
Time of Day:	All

If countermeasure is intersection-based

Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	3-leg
Traffic Control:	Stop-controlled
Major Road Traffic Volume:	13433 to 75000 Annual Average Daily Traffic (AADT)
Minor Road Traffic Volume:	51 to 2600 Annual Average Daily Traffic (AADT)

Development Details

Date Range of Data Used:	
Municipality:	
State:	CA

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

Other Details

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

This site is funded by the U.S. Department of Transportation Federal Highway Administration and maintained by the University of North Carolina Highway Safety Research Center

CMF / CRF Details

CMF ID: 326

Install a traffic signal

Description:

Prior Condition: ***No Prior Condition(s)***

Category: Intersection traffic control

Study: ***Accident Modification Factors for Traffic Engineering and ITS Improvements*****, Harkey et al., 2008**

Star Quality Rating:	★★★★★

Crash Modification Factor (CMF)	
Value:	0.23
Adjusted Standard Error:	0.02
Unadjusted Standard Error:	0.02

Crash Reduction Factor (CRF)	
Value:	77 *(This value indicates a* ***decrease*** *in crashes)*
Adjusted Standard Error:	2

Unadjusted Standard Error:	2

Applicability

Crash Type:	Angle
Crash Severity:	All
Roadway Types:	Not Specified
Number of Lanes:	
Road Division Type:	
Speed Limit:	
Area Type:	Rural
Traffic Volume:	
Time of Day:	

If countermeasure is intersection-based

Intersection Type:	Roadway/roadway (not interchange related)
Intersection Geometry:	3-leg,4-leg
Traffic Control:	Stop-controlled
Major Road Traffic Volume:	3261 to 29926 Annual Average Daily Traffic (AADT)
Minor Road Traffic Volume:	101 to 10300 Annual Average Daily Traffic (AADT)

Development Details

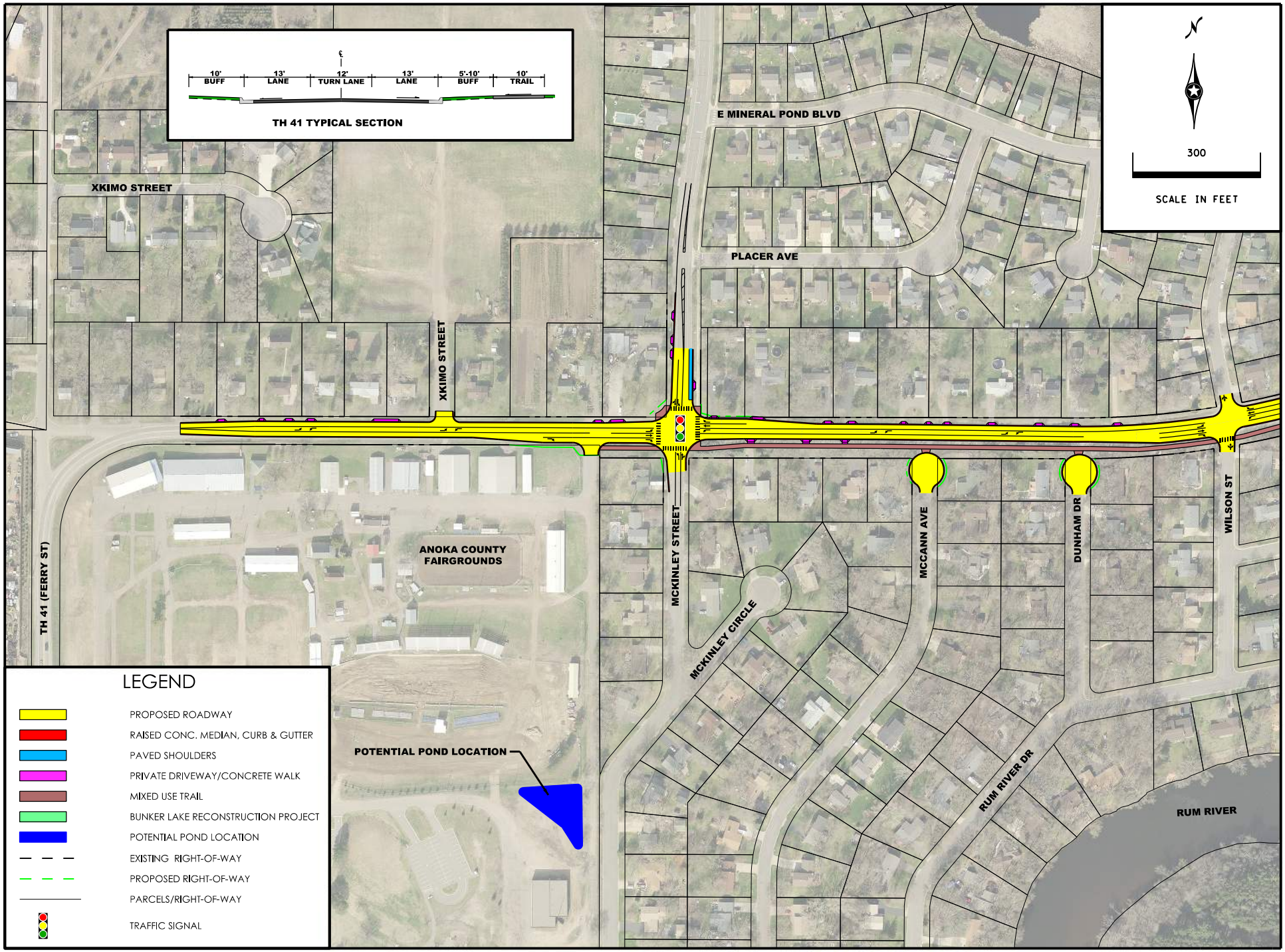
Date Range of Data Used:	
Municipality:	
State:	

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

Other Details

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

This site is funded by the U.S. Department of Transportation Federal Highway Administration and maintained by the University of North Carolina Highway Safety Research Center



TH 47 Corridor Improvements

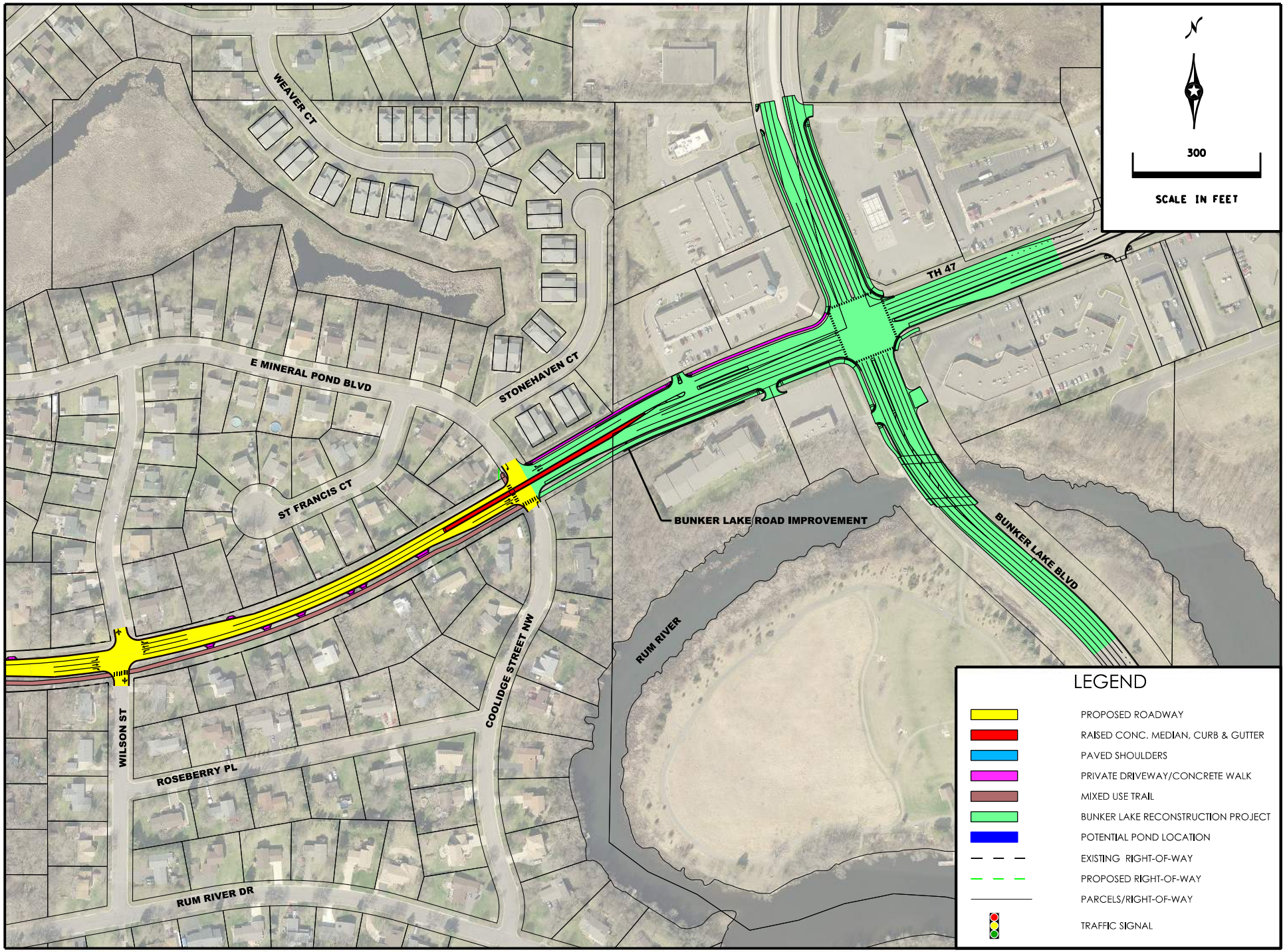
Regional Solicitation Application
City of Anoka, MN

BOLTON & MENK

DEPARTMENT OF TRANSPORTATION

ANOKA REAL. CLASSIC.

Exhibit
1 of 2



TH 47 Corridor Improvements

Regional Solicitation Application
City of Anoka, MN

BOLTON & MENK

DEPARTMENT OF TRANSPORTATION

ANOKA REAL. CLASSIC.

Exhibit 2 of 2

Anoka County
TRANSPORTATION DIVISION
Highway

Joseph J. MacPherson, P.E.
County Engineer

April 24, 2020

Mr. Ben Nelson, Project Manager
City of Anoka
2015 First Avenue North
Anoka, MN 55303-2270

RE: Letter of Support for TH 47 Improvements in the City of Anoka

Dear Mr. Nelson;

Anoka County supports the City of Anoka's application for federal funding through the Met Council's 2020 Regional Solicitation for the TH 47 Corridor Improvements Project within the City of Anoka.

The proposed project improvements link to, and leverage, the benefits of Anoka County's 2021 TH 47 and CSAH 116 (Bunker Lake Blvd) Intersection Improvement project in several ways. It extends the traffic management and safety improvements south of the TH 47 and Bunker Lake Blvd intersection through the addition of a center left turn lane along TH 47, along with a new median to prevent left turns at the intersection of TH 47 and Coolidge Street NW. Additionally, the TH 47 Improvement Project includes the addition of a new multi-use trail, which will link the Central Anoka Regional Trail and the Anoka Rum River Regional Trail. This trail network would provide access to the Anoka County Fairgrounds, Rum River South County Park, Rivers' Bend Park, Anoka High School and Anoka County Rum River Library. Additional crossing improvements at Coolidge Street NW and McKinley Street will allow pedestrian and bicycle access to this regional trail network.

Anoka County believes the proposed improvements will greatly improve the safety and reliability of the existing corridor, as well as promote improved local road access to TH 47 by enhancing critical access locations and closing, or reducing, movements at several other locations. The traffic safety and non-motorized access changes will have regional benefits beyond the local area, while also providing long-awaited improvements to adjacent neighborhoods and residents.

Sincerely,

Joseph MacPherson

Joe MacPherson, P.E.
Anoka County Transportation Division Manager/County Engineer

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

May 12, 2020

Ben Nelson
Engineering Technician, Project Manager
City of Anoka
2015 First Avenue North
Anoka, MN 55303-2270

Re: MnDOT Letter for City of Anoka
Metropolitan Council/Transportation Advisory Board 2020 Regional Solicitation Funding Request for TH 47 Reconstruction Project

Dear Ben Nelson,

This letter documents MnDOT Metro District's recognition for the City of Anoka to pursue funding for the Metropolitan Council/Transportation Advisory Board's (TAB) 2020 Regional Solicitation for TH 47 Reconstruction Project.

As proposed, this project impacts MnDOT right-of-way on MN 47. As the agency with jurisdiction of TH 47, MnDOT will allow Anoka to seek improvements proposed in the application. If funded, details of any future maintenance agreement with the City will need to be determined during the project development to define how the improvements will be maintained for the project's useful life.

No funding from MnDOT is currently programmed for this project, and no discretionary funding in state fiscal years 2024 or 2025 is currently anticipated. However Metro District does have other roadway investments planned to occur nearby and on this roadway over the next 5-6 years. Please coordinate project development with MnDOT Area staff so that our agencies can work together to best leverage our respective efforts.

MnDOT Metro District looks forward to continued cooperation with the City of Anoka as this project moves forward and as we work together to improve safety and travel options within the Metro Area.

If you have questions or require additional information at this time, please reach out to your Area Manager at Melissa.Barnes@state.mn.us or 651-234-7718.

Sincerely,

Michael Barnes

Digitally signed by Michael Barnes
Date: 2020.05.12 16:42:01 -05'00'

Michael Barnes, PE
Metro District Engineer

CC: Melissa Barnes, Metro District Area Manager
Molly McCartney, Metro Program Director
Dan Erickson, Metro State Aid Engineer

TH 47 (St. Francis Blvd) Corridor Improvements Project

Applicant, Location, & Route:

City of Anoka in Anoka County, Trunk Highway 47 from 0.1 mi south of Xkimo St north to CSAH 116 (Bunker Lake Blvd)

Application Category:

Roadways including Multimodal Elements – **Roadway Reconstruction/Modernization**

Funding Information:

Requested Award Amount: $4,152,000
Local Match: $1,038,000
Project Total: $5,190,000

Project Benefits:

Safety Improvements:
Crash reduction / safety improvements

Easier and safer left turns

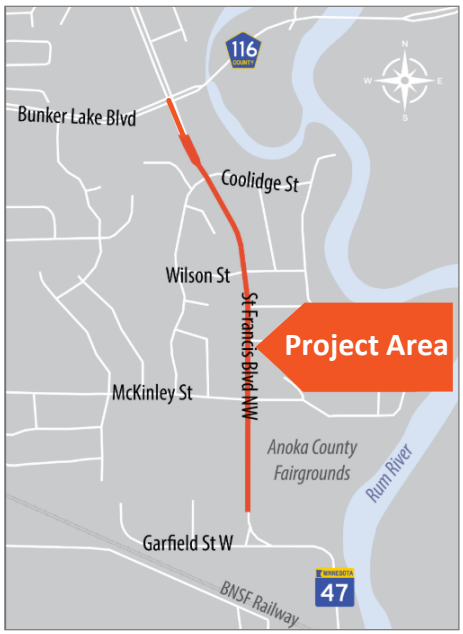
Traffic Signal:
New traffic signal and improved neighborhood access to TH 47

Efficiency:
Reduced delay

Bicycle and Pedestrian Benefits:
Multi-use trail and sidewalk

Link to regional parks, natural areas, trails, high school and public library

Marked/designated pedestrian crossings of TH 47



Project Description

This project focuses on improving intersection operations and safety, providing a new trail for bicyclists and pedestrians, and providing accommodations for left turning movements to adjacent neighborhoods. The project consists of a new signalized intersection at McKinley St which would provide a reliable access point for residents to turn onto or cross TH 47. The project includes a center turn lane for TH 47 to provide a safe means for left turns, alleviating prevalent rear-end crashes and vehicle queuing. A new trail and sidewalk facilitates biking and walking.

Project Benefits

Trunk Highway 47 (St. Francis Blvd) is an A-minor arterial road located in the City of Anoka. It is a heavily traveled (19,000+ ADT) two-lane road, providing north-south access between Highway 10 and Ramsey, and is a key freight access point to the Anoka Enterprise Park via McKinley St. The segment between the Anoka County Fairgrounds and Bunker Lake Blvd (CSAH 116) experiences a crash rate three times higher than the statewide average. This segment of road includes no turn lanes, numerous private and public access points, and no bicycle and pedestrian access. This project improves all these factors – reducing crashes, alleviating delays for TH 47 , providing better access from adjacent neighborhoods, and providing new bicycle and pedestrian infrastructure to cross and travel along the highway.

Other Information

This project links directly to an Anoka County intersection improvement project at Bunker Lake Blvd/TH 47, scheduled for 2021 construction. This includes new signal, turn lanes and trail improvements. Together, these two projects have wider regional benefits for vehicular and bike/ped access.