Application

17063 - 2022 Roadway Modernization

17715 - Dakota County CSAH 46 Modernization Project

Regional Solicitation - Roadways Including Multimodal Elements

Status:	Submitted
Submitted Date:	04/14/2022 12:47 PM

Primary Contact

Name:*	She/her/her	Jenna	Lee	Fabish
	Pronouns	First Name	Middle Name	Last Name

Title:	Assistant Design Engineer
Department:	Transportation
Email:	jenna.fabish@co.dakota.mn.us
Address:	14955 Galaxie Avenue, 3rd Floor

*	Apple Valley	Minnesota	55124
	City	State/Province	Postal Code/Zip

Phone:*	952-891-7123	
	Phone	Ext.

Fax:

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

Organization Information

Name:

Jurisdictional Agency (if different):

Organization Type:

Organization Website:

Address:

*

City State/Province Postal Code/Zip

County:

Phone:*

Ext.

Fax:

PeopleSoft Vendor Number

Project Information

Project Name	CSAH 46 Modernization Project
Primary County where the Project is Located	Dakota
Cities or Townships where the Project is Located:	City of Hastings and Nininger and Marshan Townships
Jurisdictional Agency (If Different than the Applicant):	

CSAH 46 Modernization Project includes the reconstruction of CSAH 46 from Pleasant Drive east to TH 61 from an undivided 2-lane roadway to a divided 2-lane roadway and trail construction along the north side of CSAH 46 from General Sieben Drive to Pleasant Drive. CSAH 46 is an A minor connector along this corridor.

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

The CSAH 46 modernization project will reconstruct CSAH 46 as a divided 2-lane roadway from Pleasant Drive east to TH 61, construct multi-use trail along the north side of CSAH 46 from General Sieben Drive to TH 61, construct multi-use trail along the south side from Pleasant Drive to Pine Street including a connection to the existing trail system and trail underpass at the Vermillion River bridge, construct single lane roundabouts at Pleasant Drive and Pine Street, replace the existing Vermillion River Bridge east of 31st Street, and implement access management to improve safety and mobility. These improvements will remove current weight restrictions on the Vermillion River bridge and upgrade this segment of CSAH 46 to 10-ton design standards.

(Limit 2,800 characters; approximately 400 words)

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

CSAH 46 FROM PLEASANT DR EAST TO TH 61 RECONSTRUCT TO DIVIDED 2-LANE ROADWAY, TRAIL ALONG N SIDE FROM GENERAL SIEBEN DR TO PLEASANT DR, ROUNDABOUTS AT PLEASANT DR & PINE ST, AND VERMILLION RIVER BRIDGE REPLACEMENT IN HASTINGS & MARSHAN & NINIGER TOWNSHIPS

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

Project Length (Miles)

1.7

to the nearest one-tenth of a mile

Project Funding

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

No

If yes, please identify the source(s)

Federal Amount $7,000,000.00

Match Amount $3,450,000.00

Minimum of 20% of project total

Project Total $10,450,000.00

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

Match Percentage 33.01%

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

Source of Match Funds Dakota County $2,740,500 and City of Hastings $709,500

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: 2026

Select 2024 or 2025 for TDM and Unique projects only. For all other applications, select 2026 or 2027.

Additional Program Years: 2024, 2025

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

Project Information-Roadways

County, City, or Lead Agency Dakota County

Functional Class of Road A Minor Connector

Road System CSAH

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

Road/Route No. 46

i.e., 53 for CSAH 53

Name of Road 160th Street East/County Road 47

Example; 1st ST., MAIN AVE

Zip Code where Majority of Work is Being Performed 55033

(Approximate) Begin Construction Date 04/15/2024

(Approximate) End Construction Date 08/28/2026

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

From:
(Intersection or Address) General Sieben Drive

To:
(Intersection or Address) TH 61

DO NOT INCLUDE LEGAL DESCRIPTION

Or At

Miles of Sidewalk (nearest 0.1 miles) 0

Miles of Trail (nearest 0.1 miles)	2.0
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, SIDEWALK, CURB AND GUTTER, STORM SEWER, LIGHTING, GUARDRAIL, BIKE PATH, PED RAMPS, RETAINING WALLS, BRIDGE

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:

With reference to the Thrive MSP 2040 TPP, Table 2-1 on pages 2.6 - 2.16 (and related sections/pages), the proposed modernization project relates primarily to these goals and corresponding objectives & strategies:

A. Transportation System Stewardship (p 2.6):

Goal A: Transportation System Stewardship:

Objective: Efficiently preserve and maintain the regional transportation system in a state of good repair.

Objective: Operate the regional transportation system to efficiently and cost-effectively connect people and freight to destinations

Strategies: A1 and A2 (Page 2.6)

B. Safety and Security (p 2.7):
Objective: Reduce crashes and improve safety and security for all modes of passenger travel and

freight transportation.

Strategies: B1, B4, and B6 (Page 2.7)

C. Access to Destinations (p 2.8-2.11):
Objective: Increase the availability of multimodal travel options, especially in congested highway corridors.

Objective: Increase travel time reliability and predictability for travel on highway and transit systems.

Objective: improve multimodal travel options for

people of all ages and abilities to connect to jobs and other opportunities, particularly for historically underrepresented populations.

Strategies: C1, C2, C4, C7, C8, C9, C10, C15, C16 and C17 (Page 2.8-2.10)

D. Competitive Economy (p 2.11-2.12):
Objective: Improve multimodal access to regional job concentrations identified in Thrive MSP 2040.

Objective: Invest in a multimodal transportation system to attract and retain businesses and residents.

Objective: Support the region's economic competitiveness through efficient movement of freight

Strategies: D1, D2, D3, D5 (Page 2.11)

E. Healthy Environment (p 2.12-2.14):
Objective: Reduce impacts of transportation construction, operations, and use on the natural, cultural and developed environments.
Objective: Increase the availability and attractiveness of transit, bicycling, and walking to encourage healthy communities and active car-free lifestyles.

Objective: Provide a transportation system that promotes community cohesion and connectivity for people of all ages and abilities, particularly for historically under-represented populations.

Strategies: E1, E2, E3, E4, E5, E6, and E7 (Page 2.12-2.13)

F. Leveraging Transportation Investments to Guide Land Use (p 2.14-p 2.16):

Objective: Focus regional growth in areas that support the full range of multimodal travel.

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

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

Strategies: F1, F3, F5, F6, F7 and F8 (Page 2.14-2.15)

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.

Dakota County 2040 Transportation Plan

Chapter 7
Goal 4: Replacement and Modernization of Deficient Elements of the system

List the applicable documents and pages: Unique projects are exempt from this qualifying requirement because of their innovative nature.

Figure 36 - Two to Three-lane Modernization

Dakota County 2022-2026 Capital Improvement Program (CIP)

Dakota County CIP Sheet (Trans 91)

Limit 2,800 characters, approximately 400 words

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

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

5.Applicant is a public agency (e.g., county, city, tribal government, transit provider, etc.) or non-profit organization (TDM and Unique Projects applicants only). Applicants that are not State Aid cities or counties in the seven-county metro area with populations over 5,000 must contact the MnDOT Metro State Aid Office prior to submitting their application to determine if a public agency sponsor is required.

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

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

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

7.The requested funding amount must be more than or equal to the minimum award and less than or equal to the maximum award. The cost of preparing a project for funding authorization can be substantial. For that reason, minimum federal amounts apply. Other federal funds may be combined with the requested funds for projects exceeding the maximum award, but the source(s) must be identified in the application. Funding amounts by application category are listed below in Table 1. For unique projects, the minimum award is $500,000 and the maximum award is the total amount available each funding cycle (approximately $4,000,000 for the 2022 funding cycle).
Strategic Capacity (Roadway Expansion): *$1,000,000 to $10,000,000*
Roadway Reconstruction/Modernization: *$1,000,000 to $7,000,000*
Traffic Management Technologies (Roadway System Management): *$500,000 to $3,500,000*
Spot Mobility and Safety: *$1,000,000 to $3,500,000*
Bridges Rehabilitation/Replacement: *$1,000,000 to $7,000,000*

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

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

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

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

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

Date plan completed: 06/19/2018

Link to plan: https://www.co.dakota.mn.us/Transportation/TransportationStudies/Past/Pages/ada-transition-plan.aspx#:~:text=Dakota%20County%20developed%20the%20Dakota,adjacent%20trails%20and%20pedestrian%20crossings.

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. Unique projects are exempt from this qualifying requirement.

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

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

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

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

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

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

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

Roadways Including Multimodal Elements

1.All roadway 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 Strategic Capacity and Reconstruction/Modernization and Spot Mobility projects only:

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

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

Bridge Rehabilitation/Replacement and Strategic Capacity projects only:

3.Projects requiring a grade-separated crossing of a principal arterial freeway must be limited to the federal share of those project costs identified as local (non-MnDOT) cost responsibility using 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 clear span must 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)	$500,000.00
Removals (approx. 5% of total cost)	$300,000.00
Roadway (grading, borrow, etc.)	$800,000.00
Roadway (aggregates and paving)	$2,200,000.00
Subgrade Correction (muck)	$0.00
Storm Sewer	$1,100,000.00
Ponds	$100,000.00
Concrete Items (curb & gutter, sidewalks, median barriers)	$1,100,000.00
Traffic Control	$150,000.00
Striping	$45,000.00
Signing	$55,000.00
Lighting	$270,000.00
Turf - Erosion & Landscaping	$250,000.00
Bridge	$2,400,000.00
Retaining Walls	$190,000.00
Noise Wall (not calculated in cost effectiveness measure)	$0.00
Traffic Signals	$40,000.00
Wetland Mitigation	$0.00
Other Natural and Cultural Resource Protection	$0.00
RR Crossing	$0.00
Roadway Contingencies	$100,000.00
Other Roadway Elements	$450,000.00
Totals	**$10,050,000.00**

Specific Bicycle and Pedestrian Elements

CONSTRUCTION PROJECT ELEMENTS/COST ESTIMATES	Cost
Path/Trail Construction	$330,000.00
Sidewalk Construction	$2,000.00
On-Street Bicycle Facility Construction	$0.00
Right-of-Way	$0.00
Pedestrian Curb Ramps (ADA)	$58,000.00
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	$10,000.00
Other Bicycle and Pedestrian Elements	$0.00
Totals	**$400,000.00**

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	$10,450,000.00
Construction Cost Total	$10,450,000.00
Transit Operating Cost Total	$0.00

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

Existing Employment within 1 Mile:	3572
Existing Manufacturing/Distribution-Related Employment within 1 Mile:	1147
Existing Post-Secondary Students within 1 Mile:	0
Upload Map	1649901918536_CP 46-50 Regional Economy Map.pdf

Please upload attachment in PDF form.

Measure C: Current Heavy Commercial Traffic

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

Along Tier 1:	
Miles:	0
(to the nearest 0.1 miles)	
Along Tier 2:	
Miles:	0
(to the nearest 0.1 miles)	
Along Tier 3:	
Miles:	0
(to the nearest 0.1 miles)	
The project provides a direct and immediate connection (i.e., intersects) with either a Tier 1, Tier 2, or Tier 3 corridor:	Yes
None of the tiers:	

Measure A: Current Daily Person Throughput

Location	Pleasant Drive to Pine Street
Current AADT Volume	10500

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	1649380277826_CP 46-50 Transit Connections Map.pdf

Please upload attachment in PDF form.

Response: Current Daily Person Throughput

Average Annual Daily Transit Ridership	0
Current Daily Person Throughput	13650.0

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	Dakota County Travel Demand Model
Forecast (2040) ADT volume	14800

Measure A: Engagement

i.Describe any Black, Indigenous, and People of Color populations, low-income populations, disabled populations, youth, or older adults within a ½ mile of the proposed project. Describe how these populations relate to regional context. Location of affordable housing will be addressed in Measure C.
ii.Describe how Black, Indigenous, and People of Color populations, low-income populations, persons with disabilities, youth, older adults, and residents in affordable housing were engaged, whether through community planning efforts, project needs identification, or during the project development process.
iii.Describe the progression of engagement activities in this project. A full response should answer these questions:

Response:

Dakota County and the City of Hastings partnered on a corridor study of CSAH 46 from 1/4 mile west of General Sieben Drive to TH 61 with the intent to create a vision for the corridor and to provide regional access for all users. The study began in Fall 2020. As part of the introduction to residents along the corridor, the project team mailed out an introduction letter. As part of the letter, residents were encouraged to visit the project website to provide input online about issues/concerns they were seeing along the corridor. This information was incorporated in the information presented at the first open house held virtually in January 2021. The Open House #1 information included a project video, a summary of Fall 2020 input, and information about corridor operations including crash data and speed sample data. The community was encouraged to provide input on the corridor and information presented at the first open house. Based on the study data and community input, the project team developed short-, mid-, and long-term options for the corridor. These options were presented to the community in August 2021 in both an in-person and virtual format. The in-person event was held at the County's maintenance facility that is located along the project corridor. By having the meeting along the project corridor, it allowed members of the community without access to vehicles to be able to walk or bike. As part of the project introduction letter and both open houses, the County and City utilized social media to reach additional community members with the goal to reach persons with disabilities, youth, older adults and residents in affordable housing that may not be aware of the project.

The project team reviewed the community input and incorporated it in the short-, mid, and long-term options and ultimately in the study recommendations. The community's input provided

a firsthand look at issues that were experienced along the corridor and provided guidance on potential solutions. With this input, the project team was able to develop a corridor project that provided options for all users.

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

Measure B: Equity Population Benefits and Impacts

Describe the projects benefits to Black, Indigenous, and People of Color populations, low-income populations, children, people with disabilities, youth, and older adults. Benefits could relate to:
This is not an exhaustive list. A full response will support the benefits claimed, identify benefits specific to Equity populations residing or engaged in activities near the project area, identify benefits addressing a transportation issue affecting Equity populations specifically identified through engagement, and substantiate benefits with data.
Acknowledge and describe any negative project impacts to Black, Indigenous, and People of Color populations, low-income populations, children, people with disabilities, youth, and older adults. Describe measures to mitigate these impacts. Unidentified or unmitigated negative impacts may result in a reduction in points.
Below is a list of potential negative impacts. This is not an exhaustive list.

Response:

The proposed project will provide several benefits to the community. The project will construct a trail along the north side of CSAH 46 from General Sieben Drive to TH 61, construct single lane roundabouts at Pleasant Drive and Pine Street, replace the existing Vermillion River bridge east of 31st Street, and add a center median on CSAH 46. By constructing the trail along north side of CSAH 46, it will increase access for pedestrians and bicyclists to connect to western portion of Hastings, provide a non-motorized user connection to the planned senior facility along CSAH 46 across from Riverwood Drive (construction in 2022), improve access to City parks including the Vermillion Linear Park and Vermillion Falls Park, access to the Vermillion River, improve safety (no longer walking in the shoulder), and provide access to the TH 61 corridor. The single lane roundabouts at both Pleasant Drive and Pine Street will provide improve pedestrian and bicyclist access at the intersection (only crossing one lane of traffic at a time), reduce travel time for vehicles entering and exiting CSAH 46, and will potentially reduce crashes and down time due to car repairs. The existing Vermillion River bridge is posted for load restrictions and does not have specific pedestrian/bicyclist facilities. The current bridge can be viewed as a barrier for people with disabilities, children, and older adults. The replacement bridge will be wider and accommodate pedestrian/bicyclist along both sides. The new bridge will provide a safe crossing for people with disabilities, children, and older adults. CSAH 46 will be reconstructed as a divided 2-lane roadway. The median will provide access management and reduce the potential vehicle and pedestrian and/or bicyclist conflicts which will lead to improve safety and mobility for all users.

With the proposed access management along the corridor, vehicles may divert to the local roadway systems. The diverted traffic may have a negative

impact on pedestrians and bicyclists walking in these neighborhoods. Traffic may be diverted in the neighborhood south of CSAH 46 from Village Trail to Riverwood Drive and along the north side of CSAH 46 from Pine Street to Eddy Street.

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

Measure C: Affordable Housing Access

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

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

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

Response:

The Socio-Economic Map for the project corridor indicates that 134 publicly subsidized rental housing units are within a ½ mile of the corridor. The existing corridor provides east-west access for central Hastings. The existing corridor lacks pedestrian/bicyclist facilities along CSAH 46 and the current design presents difficultly to access CSAH 46.

The proposed project will improve upon existing infrastructure. The proposed project will improve access for pedestrians and bicyclists, provide a connection between General Sieben Drive and the TH 61 business corridor, the City's Parks and trail system, and the Vermillion River. The proposed trail system will provide a safer route for pedestrian and bicyclists to visit destinations within central Hastings. The proposed trail will connect to the existing trail system that connects to the northern portion of Hastings and the County's Mississippi River Greenway system that connects further to the west into Rosemount. The proposed single lane roundabouts at Pleasant Drive and Pine Street will shorten the crossing distance for pedestrian and bicyclists and slow vehicle speeds. With the addition of the two roundabouts, pedestrians and bicyclists will have four improved crossing locations. Two existing crossing locations are the existing CSAH 46 underpass crossing (east of 31st Street) and the traffic signal at TH 61.

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

Measure D: BONUS POINTS

Project is located in an Area of Concentrated Poverty:

Projects census tracts are above the regional average for population in poverty or population of color (Regional Environmental Justice Area):

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

Yes

Upload the Socio-Economic Conditions map used for this measure.	1649902091479_CP 46-50 Socio-Economic Conditions Map.pdf

Measure A: Year of Roadway Construction

Year of Original Roadway Construction or Most Recent Reconstruction	Segment Length	Calculation	Calculation 2
1967	1.7	3343.9	1967.0
	2	**3344**	**1967**

Total Project Length

Total Project Length (as entered in "Project Information" form)	1.7

Average Construction Year

Weighted Year	1967

Total Segment Length (Miles)

Total Segment Length	1.7

Measure B: Geometric, Structural, or Infrastructure Improvements

Improved roadway to better accommodate freight movements:	Yes
Response:	The existing Vermillion River bridge has load restrictions. The proposed project will replace the bridge with a structure that will meet 10-ton roadway design and accommodate east-west freight between Lakeville and Hastings.
(Limit 700 characters; approximately 100 words)	
Improved clear zones or sight lines:	Yes

Response:

Sightline issues were identified at several intersections along the corridor during crash report review and public engagement during the CSAH 46 study. As part of the project, single lane roundabouts will be constructed at Pleasant Drive and Pine Street. The roundabouts will provide improved access for vehicles on the side streets (Pleasant Drive and Pine Street) and the proposed access management along the corridor will limit the potential for sight line issues for vehicles turning left onto the side streets by constructing the center median and restricting left turn movements. The project will also improve clear zones triangles at the side street intersections with CSAH 46.

(Limit 700 characters; approximately 100 words)

Improved roadway geometrics:

Yes

Response:

The existing corridor has bypass lanes along CSAH 46 at Pleasant Avenue, Village Trail, Riverwood Drive, 31st Street, and Pine Street. Crash data and community input indicated that the bypass lanes have potential for contributing to driver confusion related to left turning vehicles off of CSAH 46 and potential right angle and rear end crashes. The proposed project will remove the bypass lanes and replace with either a single lane roundabout (Pleasant Drive and Pine Street) or dedicated left turn lanes (Village Trail, Riverwood Drive, & 31st Street).

(Limit 700 characters; approximately 100 words)

Access management enhancements:

Yes

Response:

The current roadway configuration does not utilize access management strategies. The proposed project incorporates County access spacing and configuration guidelines (Policy M.1). The project will construct a center median from Pleasant Drive to TH 61. Several intersections along the corridor will have turning movements restricted, with full access locations remaining at Pleasant Drive, Village Trail, 31st Street, Pine Street, Eddy Street, and TH 61.

(Limit 700 characters; approximately 100 words)

Vertical/horizontal alignment improvements:

Response:

The current design has not determined if significant horizontal or vertical alignment improvements will be needed. The proposed project's medians and dedicated turn lanes will facilitate improved delineation separation and intent of vehicle movements along the curves of CSAH 46 which may reduce the potential for crashes or close calls in comparison to the current roadway configuration.

(Limit 700 characters; approximately 100 words)

Improved stormwater mitigation: Yes

Response:

The proposed project will meet or exceed City and Watershed storm sewer requirements. The storm water from the project ultimately reaches the Vermillion River. The proposed design will include pre-treatment to improve the quality of water that is discharged to the river. As the project continues through final design, the project team will continue to consider techniques that improve water quality but reduce impacts to river corridor.

(Limit 700 characters; approximately 100 words)

Signals/lighting upgrades: Yes

Response:

Pending the results of the TH 61 (complete winter 2022-2023), the existing traffic signal at CSAH 46 and TH 61 is anticipated to remain. The project will look to incorporate TH 61 study recommendations into the final design of CSAH 46's connection with TH 61. Intersection lighting will be provided at the proposed roundabouts and assessed at other intersections as part of final design.

(Limit 700 characters; approximately 100 words)

Other Improvements Yes

Response:

The existing Vermillion River bridge (east of 31st Street) is nearing the end of its life and has load restrictions. The project will replace this bridge with a wider structure that accommodates pedestrians and bicyclists and meets 10-ton roadway design.

(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
11.4	18.3	-6.9	13508	93205	-93205.2	-643114.5	Not applicable.	1649902971562_NO BUILD and BUILD_2020 PM PEAK.pdf
						-643114		

Vehicle Delay Reduced

Total Peak Hour Delay Reduced	-93205.2
Total Peak Hour Delay Reduced	-643114.5

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):
48.2	60.7	-12.5
48	**61**	**-12**

Total

Total Emissions Reduced:	-12.5
Upload Synchro Report	1649951001315_NO BUILD and BUILD_2020 PM PEAK.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:

(Limit 700 Characters; approximately 100 words)

CMF ID 207 for conversion of stop-controlled intersection into single-lane roundabout, CMF ID 253 for providing a left-turn lane on one major-road approach, CMF ID 2375 for install curb and gutter, and engineering judgement for remaining crashes.

Rationale for Crash Modification Selected:

There are 11 total through/stop-controlled intersections along the CSAH 46 corridor within the project limits. Most of the reported rear-end crashes are due to misuse of an existing bypass lane or lack of turn lanes at the intersection. Proposed improvements will convert six intersections to a right-in/right-out, convert two intersections to single-lane roundabouts, and add dedicated left and right turn lanes (where applicable) to the remaining three intersections. CMF ID 253 for providing a left-turn lane on one major-road approach was applied to rear-end crashes along CSAH 46. A crash reduction factor of 0.00 was applied to a reported head-on / U-Turn related crash as the proposed cross-section will include a raised concrete median preventing similar movements. CMF ID 207 for conversion of stop-controlled intersection to a roundabout was applied to reported angle crashes at one intersection. Proposed improvements will add a raised concrete median and curb and gutter along the CSAH 46 corridor; CMF ID 2375 for install curb and gutter was applied to segment-related run-off-road crashes.

(Limit 1400 Characters; approximately 200 words)

Project Benefit ($) from B/C Ratio	$19,248,464.00
Total Fatal (K) Crashes:	1
Total Serious Injury (A) Crashes:	2
Total Non-Motorized Fatal and Serious Injury Crashes:	0
Total Crashes:	27
Total Fatal (K) Crashes Reduced by Project:	1
Total Serious Injury (A) Crashes Reduced by Project:	1
Total Non-Motorized Fatal and Serious Injury Crashes Reduced by Project:	0
Total Crashes Reduced by Project:	7
Worksheet Attachment	1649903171208_BC Worksheet & CMFs.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: Pedestrian Safety

Determine if these measures do not apply to your project. *Does the project match either of the following descriptions?*
If either of the items are checked yes, then ***score for entire pedestrian safety measure is zero****. Applicant does not need to respond to the sub-measures and can proceed to the next section.*

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

SUB-MEASURE 1: Project-Based Pedestrian Safety Enhancements and Risk Elements
To receive maximum points in this category, pedestrian safety countermeasures selected for implementation in projects should be, to the greatest extent feasible, consistent with the countermeasure recommendations in the Regional Pedestrian Safety Action Plan and state and national best practices. Links to resources are provided on the Regional Solicitation Resources web page.
Please answer the following two questions with as much detail as possible based on the known attributes of the proposed design. If any aspect referenced in this section is not yet determined, describe the range of options being considered, to the greatest extent available. If there are project elements that may increase pedestrian risk, describe how these risks are being mitigated.
1. Describe how this project will address the safety needs of people crossing the street at signalized intersections, unsignalized intersections, midblock locations, and roundabouts.
Treatments and countermeasures should be well-matched to the roadways context (e.g., appropriate for the speed, volume, crossing distance, and other location attributes). Refer to the Regional Solicitation Resources web page for guidance links.

Response:

The proposed project will reconstruct CSAH 46 as a 2-lane divided roadway with single lane roundabouts at Pleasant Drive and Pine Street. The project will construct a trail along the north side from General Sieben Drive to TH 61 and along the south side from Pleasant Drive to Pine Street.

Currently, trail or sidewalk facilities do not exist along the CSAH 46 segment between General Sieben Drive and Pleasant. The proposed trail along the north side of CSAH 46 from General Sieben Drive to TH 61 will provide people along the north side of CSAH 46 an alternate option to utilize the trail to head east to Pleasant Drive to cross at the single lane roundabout.

Currently, trail exists along the south side of CSAH 46 from Village Trail to its connection to the existing trail system. The existing Vermillion River bridge (east of 31st Street) does not have non-motorized user accommodations. The proposed trails on the north and south side of CSAH 46 will provide improved access to the existing grade separated crossing of CSAH 46 (underpass east of 31st Street). The Vermillion bridge replacement will be wider and accommodate non-motorized users. This underpass provides connections to both CSAH 46, the City's trail system and direct access to the Vermillion Linear Park and the Vermillion Falls Park.

The proposed project (divided 2-lane) will encourage people wanting to cross CSAH 46 to consider crossing at the controlled intersections. During final design, the project team will incorporate the use of high visibility crosswalk markings at the full access uncontrolled intersections (Village Trail, 31st Street, and Eddy Street) as appropriate.

The proposed project includes constructing single lane roundabouts at both Pleasant Drive and Pine Street. The roundabouts will facilitate improved crossings by providing a reduced crossing distance (crossing one travel lane at a time) and providing a center median refuge.

(Limit 2,800 characters; approximately 400 words)

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

Select one: No

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

Response:

(Limit 1,400 characters; approximately 200 words)

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

Select one: Yes

If yes,
How many intersections will likely be affected?

Response: 5

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

Response:

The proposed project will be constructing medians that could potentially be utilized as median crossing islands depending upon results of pedestrian crossing assessments during final design. The County anticipates adopting the recommendations from its pedestrian crossing study later this spring. Recommendations from the study will be incorporated in the final design of the project for potential pedestrian crossing enhancements.

While it may be a longer distance for users to travel, they can use the proposed trails on either side of CSAH 46 between Pleasant Drive and Pine Street to utilize the single lane roundabout crossings at Pleasant Drive and Pine Street and/or the existing CSAH 46 underpass crossing east of 31st Street.

(Limit 1,400 characters; approximately 200 words)

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

Response:

The project will not be adding additional grade separating crossings. The project will provide improved connections to the existing CSAH 46 underpass east of 31st Street.

(Limit 1,400 characters; approximately 200 words)

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

Response:

On the segment from Pleasant Drive to Pine Street, trail is being provided on both sides of the roadway, improving connections that lead to desired crossing locations. This portion of the roadway has curves which may increase pedestrian risk should mid-block crossings be added . The new trail connections will guide pedestrians to the underpass crossing and roundabout locations which better manage pedestrian-vehicle interactions.

(Limit 1,400 characters; approximately 200 words)

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

Response:

The proposed roadway design includes reconstructing the roadway as an urban 2-lane with a center median. The proposed roundabouts at both Pleasant Drive and Pine Street will slow traffic speeds in these areas on the corridor and combined with the urban divided 2-lane roadway design will provide visual cues to drivers that they are entering an urban area. The segment of CSAH 46 west of the project corridor is a rural design with a posted speed limit of 55 mph.

(Limit 2,800 characters; approximately 400 words)

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

Response:

As a user heads east along the corridor, the posted speeds along the corridor transition from 55 mph on the west end to 45 mph at ¼ mile east of Pleasant Drive, and transition to 35 mph at 150 feet west of Pine Street to Highway 61. As the project team works through final design, the team may consider designing the corridor between Pleasant Drive and TH 61 to a consistent speed limit, anticipated to be between 35-45 mph. It is anticipated that the County and City will request a MnDOT speed study upon construction completion in accordance with MN Statute 169.14.

(Limit 1,400 characters; approximately 200 words)

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

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

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

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

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

Existing road has transit running on or across it with 1+ transit stops in the project area (If flag-stop route with no fixed stops, then 1+ locations in the project area where roadside stops are allowed. Do not count portions of transit routes with no stops, such as non-stop freeway sections of express or limited-stop routes. If service was temporarily reduced for the pandemic but is expected to return to 2019 levels, consider 2019 service for this item.)

Existing road has high-frequency transit running on or across it and 1+ high-frequency stops in the project area (high-frequency defined as service at least every 15 minutes from 6am to 7pm weekdays and 9am to 6pm Saturdays. If service frequency was temporarily reduced for the pandemic but is expected to return to 2019 levels, consider 2019 frequency for this item.)

Existing road is within 500 of 1+ shopping, dining, or entertainment destinations (e.g., grocery store, restaurant)

Yes

If checked, please describe:

The project provides a direct connection to the TH 61 corridor and City parks. Several destinations exist within 500' of corridor and include 2 restaurants (Applebee's and The Draft Bar House), 2 automotive related businesses (O'Reilly Auto Parts and Murphy's Auto) and Ardent Mills (flour mill). The project provides direct access to the Vermillion Linear Park and connects into the Vermillion Falls Park via existing trail.

(Limit 1,400 characters; approximately 200 words)

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

Yes

If checked, please describe:

The project provides direct access to several apartment complexes located along the corridor at Spring Street (north side), between Oak and Pine Streets (north side), and between Village Trail and 31st Street (south side). A new senior facility has received approval to begin construction in 2022. The facility will be located along the north side of CSAH 46 across from Riverwood Drive.

(Limit 1,400 characters; approximately 200 words)

Measure A: Multimodal Elements and Existing Connections

Response:

The existing corridor has a minimal amount of existing trail (along the south side of CSAH 46 from Village Trail to the existing CSAH 46 underpass crossing) and the existing Vermillion River bridge does not accommodate pedestrian and bicyclists. The proposed project will construct trail along the north side of CSAH 46 from General Sieben Drive east to TH 61 and along the south side from Pleasant Drive to Pine Street. The existing Vermillion River bridge will be replaced with a wider bridge with pedestrian and bicyclist facilities. The project will provide non-motorized users with an alternative facility that improves safety (currently walk or bike in the shoulder of CSAH 46) and connects to destinations in central Hastings including the future Vermillion River Greenway trailhead (northeast corner of CSAH 46 and General Sieben Drive), City parks (Vermillion Linear Park and Vermillion Falls Park), adjacent neighborhoods and smaller neighborhood parks, and to businesses along the TH 61 corridor.

While the project is not located along an RBTN corridor, it does provide a connection through existing trails and sidewalk within Hastings to an RBTN Tier 2 corridor along TH 61 (north of Hastings).

The existing Vermillion River bridge can be viewed as bicycle barrier without adequate facilities. The replacement bridge will provide accommodations for pedestrians and bicyclists which will provide improved connections to central Hastings. Depending on a bicyclist's experience level, they may not be comfortable crossing the existing bridge and may look to other means of transportation. The replacement bridge will remove this bicyclist barrier.

The County's 2018 ADA plan identified the CSAH 46 corridor from General Sieben Drive to TH 61 as

priority locations for sidewalks. The project will be providing a trail along the north side of CSAH 46 from General Sieben Drive to TH 61 and along the south side of CSAH 46 from Pleasant Drive to Pine Street. The project will tie into existing sidewalks along the cross streets and upgrade existing non-compliant pedestrian curb ramps.

(Limit 2,800 characters; approximately 400 words)

Transit Projects Not Requiring Construction

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

Check Here if Your Transit Project Does Not Require Construction

Measure A: Risk Assessment - Construction Projects

1.Public Involvement (20 Percent of Points)

Projects that have been through a public process with residents and other interested public entities are more likely than others to be successful. The project applicant must indicate that events and/or targeted outreach (e.g., surveys and other web-based input) were held to help identify the transportation problem, how the potential solution was selected instead of other options, and the public involvement completed to date on the project. The focus of this section is on the opportunity for public input as opposed to the quality of input. NOTE: A written response is required and failure to respond will result in zero points.

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

Yes

100%

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

50%

At least online/mail outreach effort specific to this project with the general public has been used to help identify the project need.

50%

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

25%

No outreach has led to the selection of this project.

0%

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

Response:

In the Fall 2020, Dakota County and the City of Hastings partnered on a corridor study of CSAH 46 from General Sieben Drive to TH 61 with the intent to create a vision for the corridor and to provide regional access for all users. As part of the study kickoff, the project team mailed out an introduction letter. As part of the letter, residents were encouraged to visit the project website to provide input on issues/concerns they were seeing along the corridor in an online commenting map. This information was incorporated in the data collection phase between the project introduction letters and the first open house. The data collection and community input was presented at the first open house held virtually in January 2021. The Open House information presented included a project video, a summary of Fall 2020 input, and information about corridor operations including crash data and speed sample data. The community was encouraged to provide input on the corridor and information presented at the first open house. Based on the study data and community input, the project team developed short-, mid-, and long-term options for the corridor. These options were presented to the community in August 2021 in both an in-person and virtual format. The in-person event was held at the County's maintenance facility that is located along the project corridor. By having the meeting along the project corridor, it allowed members of the community without access to vehicles to be able to walk or bike. As part of the community input review from Open House 2, the project team hosted a neighborhood meeting for the eastern segment of the project (Pine Street to TH 61) to discuss the proposed short-, mid-, and long-term options and address the neighborhood's questions. As part of the project introduction letter and both open houses, the County and City utilized social media to reach additional community members with the intent to get input from persons with disabilities, youth, older adults and residents in

affordable housing.

(Limit 2,800 characters; approximately 400 words)

2.Layout (25 Percent of Points)

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

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

100%

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

100%

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

Yes

75%

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

50%

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

25%

Layout has not been started

0%

Attach Layout

1649903716255_CP 46-50 Layout.pdf

Please upload attachment in PDF form.

Additional Attachments

Please upload attachment in PDF form.

3.Review of Section 106 Historic Resources (15 Percent of Points)

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

100%

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

Yes

100%

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

80%

Historic/archeological property impacted; determination of adverse effect anticipated

40%

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

0%

Project is located on an identified historic bridge

4.Right-of-Way (25 Percent of Points)

Right-of-way, permanent or temporary easements, and MnDOT agreement/limited-use permit either not required or all have been acquired

100%

Right-of-way, permanent or temporary easements, and/or MnDOT agreement/limited-use permit required - plat, legal descriptions, or official map complete

50%

Right-of-way, permanent or temporary easements, and/or MnDOT agreement/limited-use permit required - parcels identified Yes

25%

Right-of-way, permanent or temporary easements, and/or MnDOT agreement/limited-use permit required - parcels not all identified

0%

5.Railroad Involvement (15 Percent of Points)

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

100%

Signature Page

Please upload attachment in PDF form.

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

50%

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

0%

Measure A: Cost Effectiveness

Total Project Cost (entered in Project Cost Form):	$10,450,000.00
Enter Amount of the Noise Walls:	$0.00

Total Project Cost subtract the amount of the noise walls:	$10,450,000.00
Enter amount of any outside, competitive funding:	$0.00
Attach documentation of award:	
Points Awarded in Previous Criteria	
Cost Effectiveness	$0.00

Other Attachments

File Name	Description	File Size
Attachment A - 1 page Summary.pdf	Attachment A - 1 Page Summary	124 KB
Attachment B - Existing Conditions.pdf	Attachment B - Existing Conditions/Photographs	2.3 MB
Attachment C - Project Layout.pdf	Attachment C - Project Layout	3.2 MB
Attachment D - Identified ROW Parcels.pdf	Attachment D - Identified ROW Parcels	2.8 MB
Attachment E - Met Council Maps.pdf	Attachment E - Met Council Maps (4 total)	11.8 MB
Attachment F - Letters of Support.pdf	Attachment F - Letters of Support (2 total)	1.1 MB
Attachment G - Met Council Thrive Goals.pdf	Attachment G - Met Council Thrive MSP Plan Goal Sheets	159 KB
Attachment H - DC Goals.pdf	Attachment H - Dakota County 2040 Transportation Plan Goals Sheets	950 KB
Attachment I - DC CIP Sheet.pdf	Attachment I - Dakota County CIP sheet	440 KB
Attachment J - City of Hastings Park Map.pdf	Attachment J - City of Hastings Park Map	1.4 MB
Attachment K - Vermillion River Greenway Master Plan Exerpts.pdf	Attachment K - Vermillion River Greenway Excerpts	2.6 MB
Attachment L - CSAH 46 Study Recommendations.pdf	Attachment L - Adopted CSAH 46 Study Recommendations	1.6 MB
Attachment M - Open House 1 Summary.pdf	Attachment M - CSAH 46 Open House 1 Summary Sheet	219 KB
Attachment N - Open House 2 Summary.pdf	Attachment N - CSAH 46 Open House 2 Summary Sheet	762 KB
Attachment O - DC ADA Plan and Inventory.pdf	Attachment O - County?s ADA Transition Plan Excerpts and Inventory Sheets	1.1 MB
Attachment P - RBTN Screenshots.pdf	Attachment P - RBTN Screenshots of Project Area	383 KB
CP 46-50 Attachment Listing.pdf	Attachment Listing	93 KB
Dakota County Resolution 22-144 - Approval of Grant Submittals.pdf	Dakota County Resolution to submit applications	89 KB

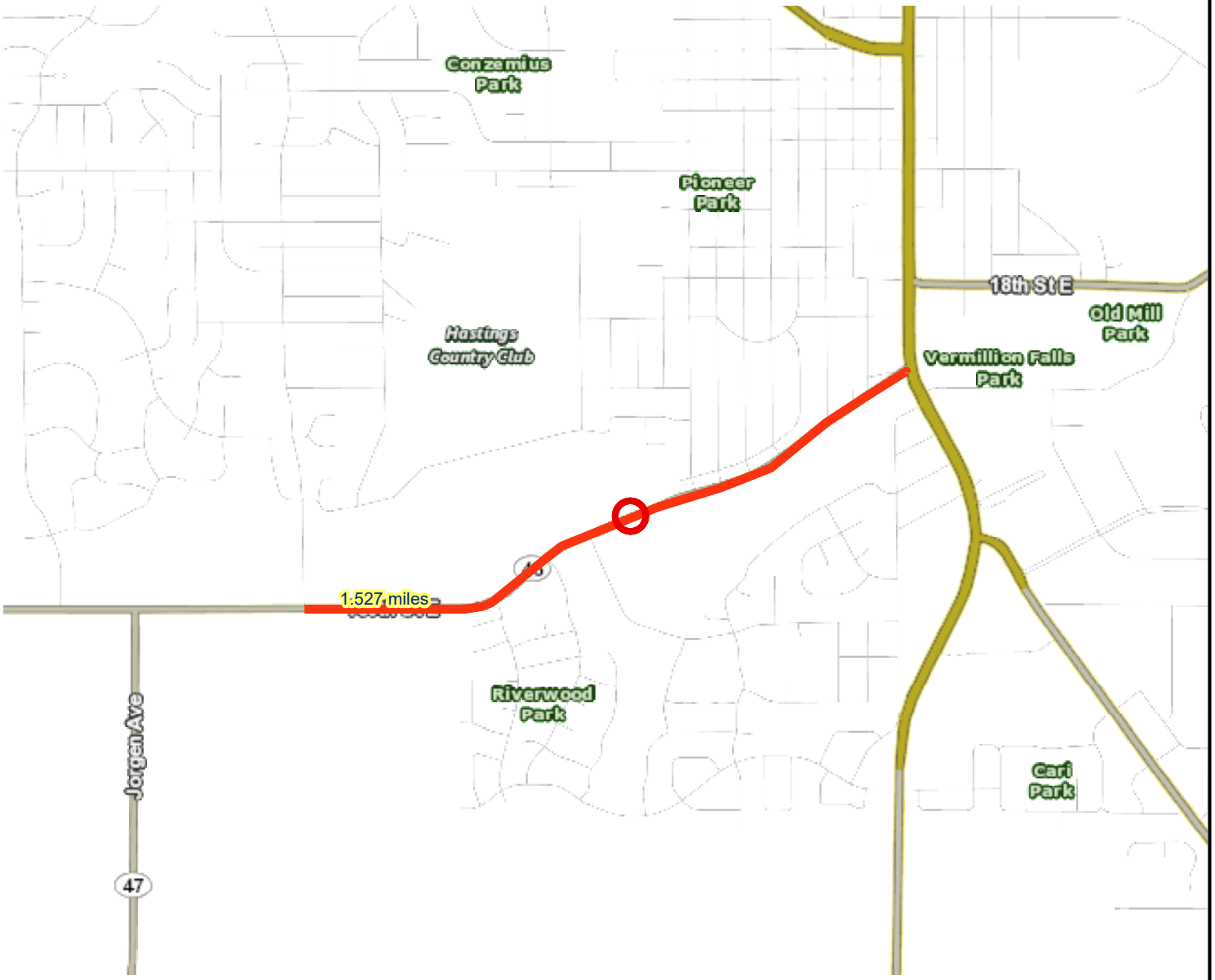
Regional Economy

Strategic Capacity Project: CSAH 46 Modernization Project | Map ID: 1649075592141

Results

WITHIN ONE MI of project:
Postsecondary Students: 0

Totals by City:
Hastings
Population: 10676
Employment: 2980
Mfg and Dist Employment: 982
Marshan Twp.
Population: 4382
Employment: 592
Mfg and Dist Employment: 165



Project Points
Project
Manfacturing/Distribution Centers
Job Concentration Centers

0 0.225 0.45 0.9 1.35 1.8 Miles

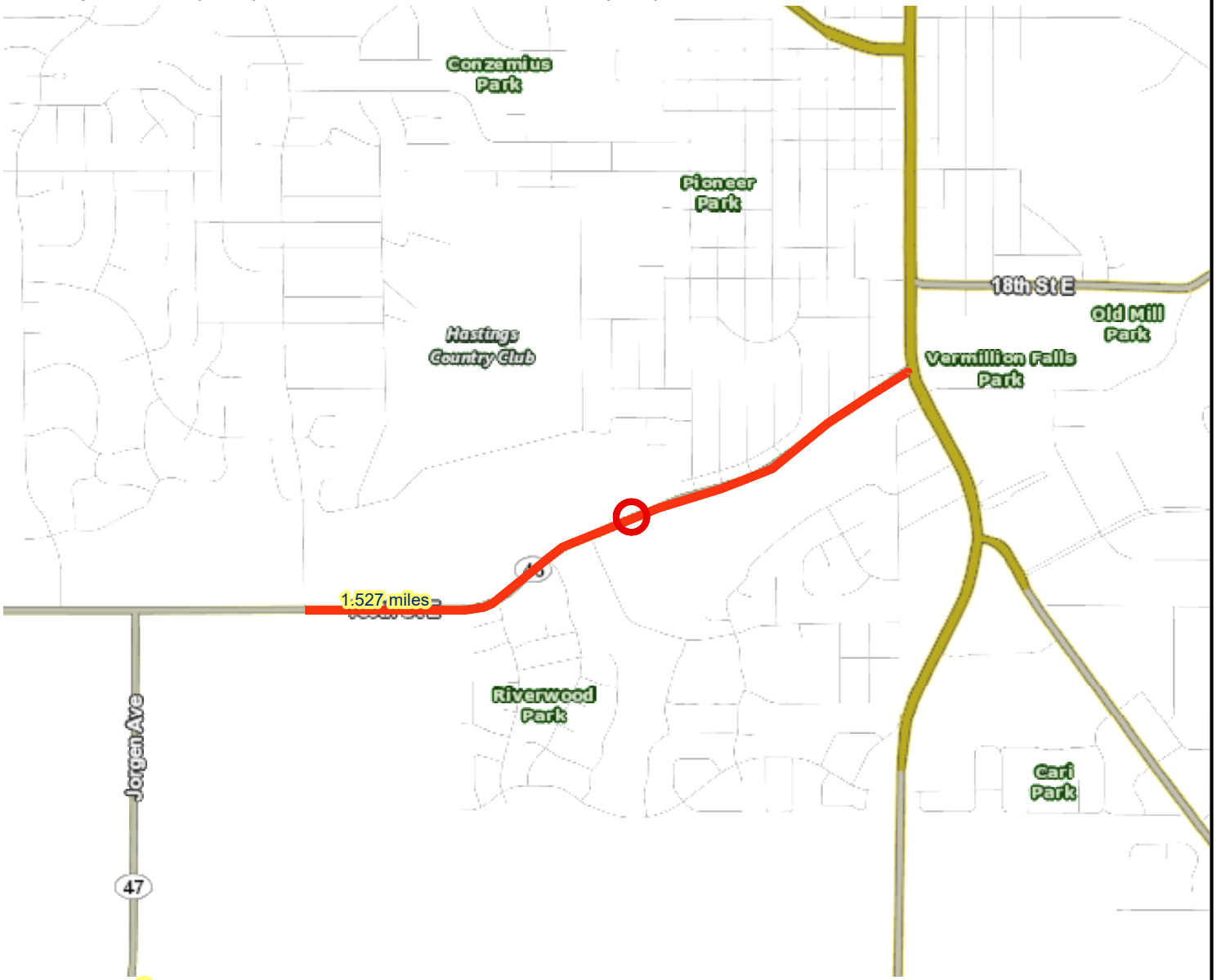
Created: 4/4/2022
LandscapeRSA5

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

METROPOLITAN COUNCIL

Transit Connections

Strategic Capacity Project: CSAH 46 Modernization Project | Map ID: 1649075592141



Results

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

**indicates Planned Alignments*

Transit Market areas: 5

Project Points	Commuter Rail	Commuter Rail	Dedicated Bus Rapid Transit	Arterial Bus Rapid Transit	Modern Streetcar
Project	Dedicated Bus Rapid Transit	Dedicated Bus Rapid Transit	Highway Bus Rapid Transit	Commuter Rail	Undetermined
Project Area	Highway Bus Rapid Transit	Highway Bus Rapid Transit	Light Rail	Dedicated Bus Rapid Transit	
Active Stop	Light Rail	Light Rail	Modern Streetcar	Highway Bus Rapid Transit	
Arterial Bus Rapid Transit	Arterial Bus Rapid Transit	Arterial Bus Rapid Transit	Undetermined	Light Rail	

0 0.225 0.45 0.9 1.35 1.8 Miles

Created: 4/4/2022
LandscapeRSA3

METROPOLITAN COUNCIL

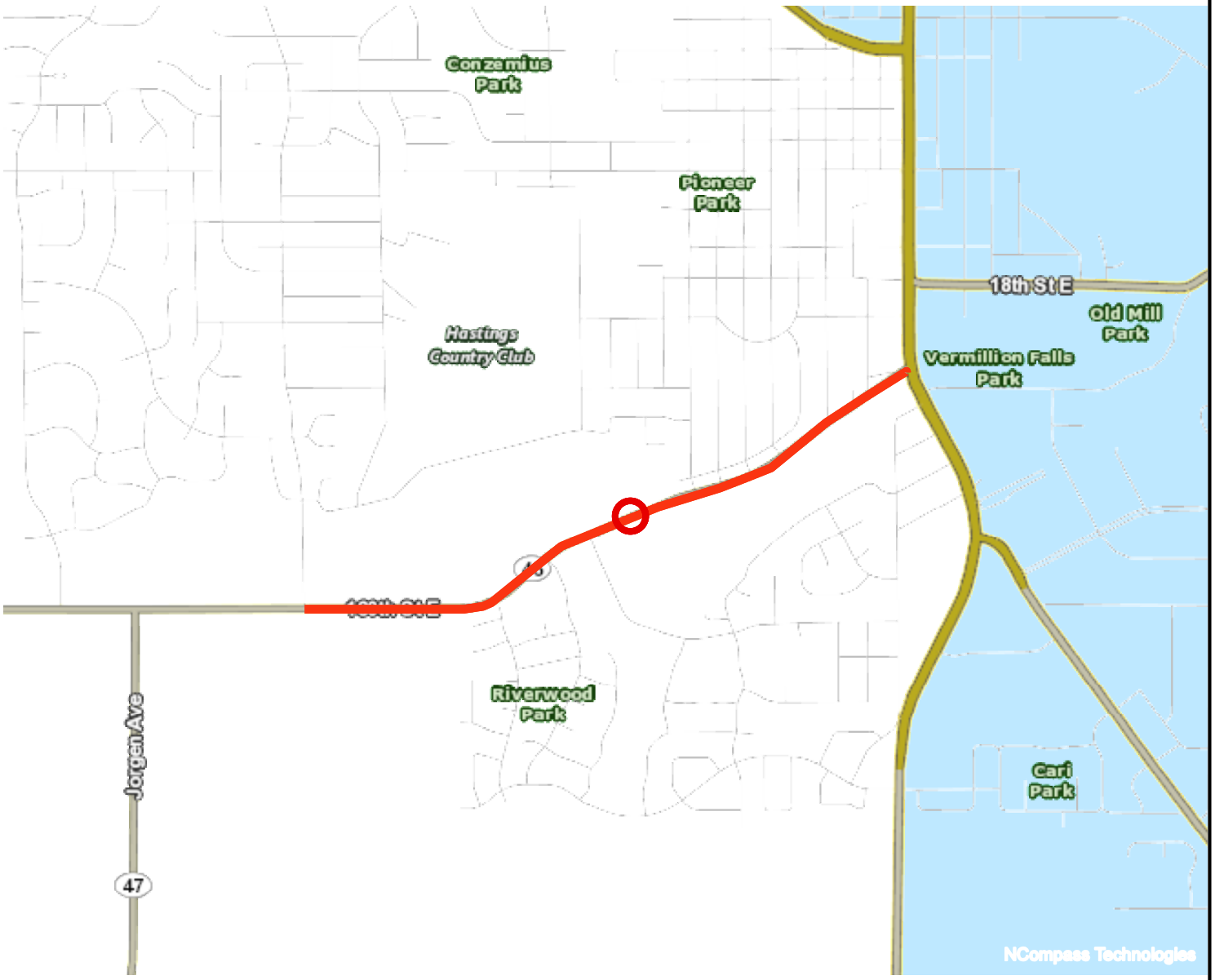
Socio-Economic Conditions

Strategic Capacity Project: CSAH 46 Modernization Project | Map ID: 1649075592141

Results

Total of publicly subsidized rental housing units in census tracts within 1/2 mile: 134

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



Points
Lines
Area of Concentrated Poverty
Regional Environmental Justice Area

0 0.225 0.45 0.9 1.35 1.8 Miles

Created: 4/4/2022
LandscapeRSA2

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

METROPOLITAN COUNCIL

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	7:00	7:00	7:00	7:00	7:00	7:00	7:00
End Time	8:15	8:15	8:15	8:15	8:15	8:15	8:15
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4	4
Volume counts from "S:\2020\200186\TRAFFIC ANALYSIS\VOLS\PM PEAK.csv" data file(s)							
Volume date = 09/27/2019							
Vehs Entered	1697	1693	1734	1732	1760	1756	1747
Vehs Exited	1701	1698	1757	1733	1768	1752	1750
Starting Vehs	59	75	79	73	67	66	73
Ending Vehs	55	70	56	72	59	70	70
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	1	0	1	0	0	0	0
Travel Distance (mi)	2374	2404	2459	2431	2491	2490	2474
Travel Time (hr)	70.0	70.6	72.1	71.9	73.1	73.1	73.0
Total Delay (hr)	5.6	5.7	6.0	6.0	6.3	6.4	6.4
Total Stops	717	739	712	765	711	742	745
Fuel Used (gal)	73.2	72.9	74.8	74.4	75.5	76.0	75.5

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	7:00	7:00	7:00	7:00
End Time	8:15	8:15	8:15	8:15
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	5	5	5	5
# of Recorded Intervals	4	4	4	4
Volume counts from "S:\2020\200186\TRAFFIC ANALYSIS\VOLS\PM PEAK.csv" data file(s)				
Volume date = 09/27/2019				
Vehs Entered	1705	1738	1647	1721
Vehs Exited	1674	1738	1660	1724
Starting Vehs	53	68	74	65
Ending Vehs	84	68	61	63
Denied Entry Before	0	1	0	0
Denied Entry After	0	0	0	0
Travel Distance (mi)	2386	2460	2387	2436
Travel Time (hr)	70.7	71.9	69.6	71.6
Total Delay (hr)	6.0	5.9	5.7	6.0
Total Stops	774	693	701	732
Fuel Used (gal)	72.9	74.8	72.1	74.2

Interval #0 Information Seeding

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:15
End Time	7:30
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	412	470	433	467	447	436	415
Vehs Exited	407	466	455	470	427	425	403
Starting Vehs	59	75	79	73	67	66	73
Ending Vehs	64	79	57	70	87	77	85
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	1	0	0	0	0
Travel Distance (mi)	573	672	630	673	632	611	589
Travel Time (hr)	16.9	20.0	18.7	19.9	18.5	18.0	17.2
Total Delay (hr)	1.2	1.7	1.5	1.7	1.5	1.5	1.4
Total Stops	171	219	185	210	164	180	181
Fuel Used (gal)	17.6	20.5	19.2	20.3	18.8	18.5	17.8

Interval #1 Information Recording

Start Time	7:15
End Time	7:30
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	420	450	422	438
Vehs Exited	403	430	422	432
Starting Vehs	53	68	74	65
Ending Vehs	70	88	74	72
Denied Entry Before	0	1	0	0
Denied Entry After	0	0	0	0
Travel Distance (mi)	570	634	619	620
Travel Time (hr)	16.8	18.5	18.2	18.3
Total Delay (hr)	1.2	1.5	1.5	1.5
Total Stops	181	172	173	184
Fuel Used (gal)	17.5	19.4	18.7	18.8

Interval #2 Information Recording

Start Time	7:30
End Time	7:45
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	457	422	453	413	466	476	457
Vehs Exited	459	427	438	416	470	466	463
Starting Vehs	64	79	57	70	87	77	85
Ending Vehs	62	74	72	67	83	87	79
Denied Entry Before	0	0	1	0	0	0	0
Denied Entry After	1	0	0	0	0	0	1
Travel Distance (mi)	656	595	619	562	657	686	656
Travel Time (hr)	19.5	17.6	18.0	16.5	19.5	20.3	19.5
Total Delay (hr)	1.6	1.4	1.4	1.3	1.6	1.7	1.7
Total Stops	183	193	168	158	209	210	181
Fuel Used (gal)	20.2	18.1	18.7	17.1	20.3	21.1	20.3

Interval #2 Information Recording

Start Time	7:30
End Time	7:45
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	466	441	416	444
Vehs Exited	461	456	422	447
Starting Vehs	70	88	74	72
Ending Vehs	75	73	68	68
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0
Travel Distance (mi)	665	632	608	634
Travel Time (hr)	20.0	18.5	17.8	18.7
Total Delay (hr)	1.8	1.6	1.4	1.6
Total Stops	223	171	188	185
Fuel Used (gal)	20.3	19.2	18.3	19.4

Interval #3 Information Recording

Start Time	7:45
End Time	8:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	432	385	435	418	437	410	454
Vehs Exited	426	403	432	403	458	422	458
Starting Vehs	62	74	72	67	83	87	79
Ending Vehs	68	56	75	82	62	75	75
Denied Entry Before	1	0	0	0	0	0	1
Denied Entry After	0	1	0	1	0	2	0
Travel Distance (mi)	584	565	615	575	635	574	624
Travel Time (hr)	17.1	16.4	17.9	17.0	18.6	16.6	18.6
Total Delay (hr)	1.4	1.3	1.5	1.4	1.7	1.4	1.6
Total Stops	185	152	169	190	179	164	209
Fuel Used (gal)	18.0	16.9	18.5	17.7	19.2	17.3	19.0

Interval #3 Information Recording

Start Time	7:45
End Time	8:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	378	421	420	417
Vehs Exited	384	434	414	422
Starting Vehs	75	73	68	68
Ending Vehs	69	60	74	64
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0
Travel Distance (mi)	532	607	594	590
Travel Time (hr)	15.4	17.6	17.2	17.2
Total Delay (hr)	1.2	1.5	1.4	1.4
Total Stops	170	177	167	175
Fuel Used (gal)	16.3	18.2	18.0	17.9

Interval #4 Information Recording

Start Time	8:00
End Time	8:15
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	396	416	413	434	410	434	421
Vehs Exited	409	402	432	444	413	439	426
Starting Vehs	68	56	75	82	62	75	75
Ending Vehs	55	70	56	72	59	70	70
Denied Entry Before	0	1	0	1	0	2	0
Denied Entry After	1	0	1	0	0	0	0
Travel Distance (mi)	561	572	595	621	566	619	606
Travel Time (hr)	16.5	16.7	17.5	18.4	16.6	18.2	17.7
Total Delay (hr)	1.4	1.3	1.5	1.5	1.5	1.7	1.6
Total Stops	178	175	190	207	159	188	174
Fuel Used (gal)	17.4	17.4	18.4	19.2	17.2	19.1	18.4

Interval #4 Information Recording

Start Time	8:00
End Time	8:15
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	441	426	389	419
Vehs Exited	426	418	402	419
Starting Vehs	69	60	74	64
Ending Vehs	84	68	61	63
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0
Travel Distance (mi)	618	588	566	591
Travel Time (hr)	18.5	17.3	16.4	17.4
Total Delay (hr)	1.9	1.4	1.3	1.5
Total Stops	200	173	173	184
Fuel Used (gal)	18.8	18.0	17.1	18.1

402: Vermillion Rd & Eddy St Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.3	0.4	0.1	0.1	0.2
Total Delay (hr)	0.0	0.1	0.0	0.0	0.0	0.0	0.1
Total Del/Veh (s)	2.9	0.4	0.3	0.1	10.6	4.0	0.4
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	1.3	0.0	0.0	0.0	9.0	4.6	0.1
Total Stops	3	2	0	0	4	3	12
Stop/Veh	0.33	0.00	0.00	0.00	1.00	1.00	0.01
Travel Dist (mi)	0.3	18.3	20.2	0.0	1.1	0.7	40.7
Travel Time (hr)	0.0	0.6	0.7	0.0	0.1	0.0	1.3
Avg Speed (mph)	15	31	33	20	22	24	31
Fuel Used (gal)	0.0	0.5	0.9	0.0	0.0	0.0	1.5
Fuel Eff. (mpg)	39.3	35.7	21.3	58.3	36.3	38.3	26.8
HC Emissions (g)	0	10	23	0	0	0	33
CO Emissions (g)	2	154	881	0	2	1	1042
NOx Emissions (g)	0	29	63	0	0	0	93
Vehicles Entered	9	481	434	1	4	3	932
Vehicles Exited	9	481	434	1	4	3	932
Hourly Exit Rate	9	481	434	1	4	3	932
Input Volume	10	483	448	1	6	2	950
% of Volume	90	100	97	100	67	150	98
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)							1365
Occupancy (veh)	0	1	1	0	0	0	1

403: Vermillion Rd & Spring St Performance by movement

Movement	EBL	EBT	WBT	WBR	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)		0.0	0.0	0.0	0.1	0.0
Total Delay (hr)	0.0	0.1	0.0	0.0	0.0	0.1
Total Del/Veh (s)		0.6	0.2	0.0	2.8	0.4
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)		0.0	0.0	0.0	2.6	0.0
Total Stops	0	0	0	0	2	2
Stop/Veh		0.00	0.00	0.00	1.00	0.00
Travel Dist (mi)	0.0	33.7	17.7	0.2	0.1	51.6
Travel Time (hr)	0.0	1.1	0.5	0.0	0.0	1.6
Avg Speed (mph)	19	32	33	19	13	32
Fuel Used (gal)	0.0	1.0	0.5	0.0	0.0	1.5
Fuel Eff. (mpg)	54.5	35.2	35.7	79.4	51.7	35.4
HC Emissions (g)	0	17	10	0	0	26
CO Emissions (g)	0	308	175	0	0	484
NOx Emissions (g)	0	52	31	0	0	83
Vehicles Entered	0	490	434	4	2	930
Vehicles Exited	0	490	435	4	2	931
Hourly Exit Rate	0	490	435	4	2	931
Input Volume	0	492	447	5	3	947
% of Volume		100	97	80	67	98
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0
Density (ft/veh)						502
Occupancy (veh)	0	1	1	0	0	2

404: Vermillion Rd & Ashland St Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Delay (hr)	0.0	0.2	0.0	0.0	0.0	0.0	0.2
Total Del/Veh (s)	3.8	1.1	0.3	0.0	10.4	4.4	0.9
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	1.3	0.0	0.0	0.0	9.1	5.0	0.1
Total Stops	4	2	0	0	5	10	21
Stop/Veh	0.36	0.00	0.00	0.00	1.00	0.91	0.02
Travel Dist (mi)	1.5	67.3	28.4	0.2	1.4	3.4	102.3
Travel Time (hr)	0.1	2.1	0.9	0.0	0.1	0.1	3.2
Avg Speed (mph)	25	32	33	23	22	25	32
Fuel Used (gal)	0.0	1.9	0.8	0.0	0.0	0.1	2.8
Fuel Eff. (mpg)	39.0	36.1	36.2	63.0	37.9	36.9	36.3
HC Emissions (g)	0	33	16	0	0	2	50
CO Emissions (g)	6	552	284	0	3	29	873
NOx Emissions (g)	1	101	48	0	0	5	156
Vehicles Entered	11	486	430	3	4	11	945
Vehicles Exited	11	485	431	3	5	10	945
Hourly Exit Rate	11	485	431	3	5	10	945
Input Volume	10	487	444	4	5	10	960
% of Volume	110	100	97	75	100	100	98
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)							842
Occupancy (veh)	0	2	1	0	0	0	3

405: Vermillion Rd & Walnut St Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Delay (hr)	0.0	0.1	0.1	0.0	0.0	0.0	0.2
Total Del/Veh (s)	3.2	0.6	0.7	0.4	9.3	3.4	0.8
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	1.2	0.0	0.0	0.0	7.5	3.2	0.1
Total Stops	3	1	0	0	6	5	15
Stop/Veh	0.33	0.00	0.00	0.00	1.00	1.00	0.02
Travel Dist (mi)	0.7	40.3	60.6	1.4	1.5	1.2	105.7
Travel Time (hr)	0.0	1.3	1.8	0.1	0.1	0.0	3.3
Avg Speed (mph)	21	32	33	28	22	25	32
Fuel Used (gal)	0.0	1.1	1.7	0.0	0.0	0.0	2.9
Fuel Eff. (mpg)	43.6	36.2	36.2	44.7	36.1	38.8	36.4
HC Emissions (g)	0	19	31	1	0	0	52
CO Emissions (g)	2	327	542	14	6	3	895
NOx Emissions (g)	0	60	97	2	1	0	161
Vehicles Entered	9	490	433	10	6	5	953
Vehicles Exited	9	491	433	10	6	5	954
Hourly Exit Rate	9	491	433	10	6	5	954
Input Volume	7	490	446	10	7	5	965
% of Volume	129	100	97	100	86	100	99
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)							747
Occupancy (veh)	0	1	2	0	0	0	3

406: Maple St & Vermillion Rd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Delay (hr)	0.0	0.1	0.1	0.0	0.0	0.0	0.1
Total Del/Veh (s)	3.2	0.4	0.5	0.3	8.4	3.3	0.5
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	1.4	0.0	0.0	0.0	7.0	3.4	0.0
Total Stops	3	1	0	0	1	4	9
Stop/Veh	0.50	0.00	0.00	0.00	1.00	1.00	0.01
Travel Dist (mi)	0.4	32.7	35.3	0.2	0.2	0.9	69.6
Travel Time (hr)	0.0	1.0	1.1	0.0	0.0	0.0	2.2
Avg Speed (mph)	20	32	33	24	21	24	32
Fuel Used (gal)	0.0	0.9	1.0	0.0	0.0	0.0	1.9
Fuel Eff. (mpg)	46.8	36.1	35.3	47.9	36.9	38.6	35.8
HC Emissions (g)	0	16	18	0	0	0	34
CO Emissions (g)	1	284	331	0	1	2	619
NOx Emissions (g)	0	50	56	0	0	0	107
Vehicles Entered	6	498	435	2	1	4	946
Vehicles Exited	6	498	435	2	1	4	946
Hourly Exit Rate	6	498	435	2	1	4	946
Input Volume	7	496	449	2	1	4	959
% of Volume	86	100	97	100	100	100	99
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)							1118
Occupancy (veh)	0	1	1	0	0	0	2

407: Vermillion Rd & Oak St Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.1	0.1	0.0
Total Delay (hr)	0.0	0.1	0.1	0.0	0.0	0.0	0.1
Total Del/Veh (s)	2.7	0.4	0.5	0.1	9.9	3.1	0.5
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	1.4	0.1	0.0	0.0	8.1	3.1	0.1
Total Stops	1	1	0	0	4	3	9
Stop/Veh	0.25	0.00	0.00	0.00	1.00	1.00	0.01
Travel Dist (mi)	0.2	34.0	28.6	0.5	0.8	0.6	64.7
Travel Time (hr)	0.0	1.1	0.9	0.0	0.0	0.0	2.1
Avg Speed (mph)	20	31	32	23	20	24	31
Fuel Used (gal)	0.0	1.0	0.8	0.0	0.0	0.0	1.9
Fuel Eff. (mpg)	42.8	32.4	36.0	59.4	37.2	39.6	34.2
HC Emissions (g)	0	20	14	0	0	0	34
CO Emissions (g)	1	476	263	2	1	1	745
NOx Emissions (g)	0	60	45	0	0	0	105
Vehicles Entered	4	501	437	7	4	3	956
Vehicles Exited	4	500	437	7	4	3	955
Hourly Exit Rate	4	500	437	7	4	3	955
Input Volume	4	500	450	8	4	3	969
% of Volume	100	100	97	88	100	100	99
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)							822
Occupancy (veh)	0	1	1	0	0	0	2

408: Pine St & Vermillion Rd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.4	2.8	0.3
Total Delay (hr)	0.1	0.3	0.1	0.0	0.2	0.2	0.8
Total Del/Veh (s)	3.9	1.9	0.7	0.2	14.5	5.2	2.4
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.2	0.2	0.4
Stop Del/Veh (s)	2.0	0.1	0.0	0.0	12.4	4.8	1.1
Total Stops	24	0	0	0	48	116	188
Stop/Veh	0.44	0.00	0.00	0.00	1.00	0.99	0.17
Travel Dist (mi)	13.9	118.2	27.7	1.6	11.1	27.4	199.9
Travel Time (hr)	0.4	3.0	0.9	0.1	0.6	1.3	6.3
Avg Speed (mph)	32	40	31	23	19	23	32
Fuel Used (gal)	0.4	3.2	0.9	0.0	0.3	0.8	5.6
Fuel Eff. (mpg)	37.7	37.0	32.3	56.9	33.5	33.9	35.8
HC Emissions (g)	8	81	17	1	4	14	124
CO Emissions (g)	200	2029	370	10	87	269	2964
NOx Emissions (g)	27	270	52	1	12	36	399
Vehicles Entered	55	465	418	24	47	116	1125
Vehicles Exited	54	465	418	24	48	116	1125
Hourly Exit Rate	54	465	418	24	48	116	1125
Input Volume	57	462	428	27	49	112	1135
% of Volume	95	101	98	89	98	104	99
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)							997
Occupancy (veh)	0	3	1	0	1	1	6

409: 31st St & Vermillion Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.4	0.0	0.1	0.3	0.0	0.2	0.2	0.1
Total Delay (hr)	0.0	0.1	0.0	0.1	0.2	0.3	0.1	0.9
Total Del/Veh (s)	5.2	1.0	0.5	4.8	1.7	16.3	5.4	2.5
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.4
Stop Del/Veh (s)	3.4	0.0	0.0	2.7	0.1	14.0	4.5	1.2
Total Stops	1	0	1	31	1	72	51	157
Stop/Veh	1.00	0.00	0.01	0.48	0.00	0.96	0.98	0.12
Travel Dist (mi)	0.1	50.9	8.3	15.8	122.3	33.5	23.7	254.7
Travel Time (hr)	0.0	1.3	0.3	0.5	3.2	1.5	0.9	7.8
Avg Speed (mph)	22	39	28	30	38	22	26	33
Fuel Used (gal)	0.0	1.7	0.2	0.6	4.9	1.0	0.7	8.9
Fuel Eff. (mpg)	41.8	30.4	47.9	27.9	25.2	34.1	35.2	28.5
HC Emissions (g)	0	39	4	12	124	16	16	211
CO Emissions (g)	1	1198	95	433	4155	277	258	6417
NOx Emissions (g)	0	133	11	38	400	44	41	667
Vehicles Entered	1	496	79	64	498	73	52	1263
Vehicles Exited	1	496	79	63	497	73	51	1260
Hourly Exit Rate	1	496	79	63	497	73	51	1260
Input Volume	1	500	82	64	503	74	47	1271
% of Volume	100	99	96	98	99	99	109	99
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0
Density (ft/veh)								1147
Occupancy (veh)	0	1	0	1	3	1	1	8

410: Riverwood Dr & Vermillion Rd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Delay (hr)	0.1	0.0	0.0	0.1	0.1	0.0	0.4
Total Del/Veh (s)	1.0	0.4	3.6	0.7	11.1	4.3	1.1
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Stop Del/Veh (s)	0.0	0.0	2.3	0.1	9.4	4.3	0.3
Total Stops	0	0	13	0	17	23	53
Stop/Veh	0.00	0.00	0.48	0.00	1.00	0.96	0.04
Travel Dist (mi)	83.8	4.2	2.9	57.5	4.6	6.4	159.4
Travel Time (hr)	2.1	0.1	0.1	1.5	0.2	0.3	4.3
Avg Speed (mph)	41	34	24	39	21	24	37
Fuel Used (gal)	2.3	0.1	0.1	2.1	0.1	0.2	4.8
Fuel Eff. (mpg)	36.6	45.8	31.7	27.8	35.9	35.2	32.9
HC Emissions (g)	54	2	2	53	1	4	116
CO Emissions (g)	1241	58	65	1593	22	65	3044
NOx Emissions (g)	194	7	5	175	3	10	395
Vehicles Entered	540	27	27	551	16	23	1184
Vehicles Exited	540	28	27	552	17	23	1187
Hourly Exit Rate	540	28	27	552	17	23	1187
Input Volume	547	26	29	556	17	24	1199
% of Volume	99	108	93	99	100	96	99
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)							976
Occupancy (veh)	2	0	0	1	0	0	4

411: Village Tr & Vermillion Rd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.1	0.0	0.1	0.1	0.0
Total Delay (hr)	0.3	0.0	0.0	0.1	0.2	0.0	0.8
Total Del/Veh (s)	2.0	1.6	3.6	0.9	13.8	7.7	2.2
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.2	0.0	0.3
Stop Del/Veh (s)	0.1	0.1	2.5	0.0	11.9	7.5	0.8
Total Stops	0	0	10	0	56	18	84
Stop/Veh	0.00	0.00	0.50	0.00	0.98	1.00	0.07
Travel Dist (mi)	238.1	29.2	3.1	79.3	19.1	6.0	374.9
Travel Time (hr)	5.8	0.8	0.1	1.9	0.9	0.3	9.7
Avg Speed (mph)	41	38	28	41	22	23	39
Fuel Used (gal)	6.6	0.7	0.1	2.2	0.6	0.2	10.3
Fuel Eff. (mpg)	36.1	39.3	43.4	36.3	34.3	34.4	36.3
HC Emissions (g)	159	16	1	54	7	3	240
CO Emissions (g)	3744	397	28	1238	135	47	5589
NOx Emissions (g)	570	58	4	192	20	7	851
Vehicles Entered	552	67	20	518	56	18	1231
Vehicles Exited	553	67	20	518	56	18	1232
Hourly Exit Rate	553	67	20	518	56	18	1232
Input Volume	560	66	22	519	56	17	1240
% of Volume	99	102	91	100	100	106	99
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)							814
Occupancy (veh)	6	1	0	2	1	0	10

412: Vermillion Rd & Pleasant Dr Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Delay (hr)	0.1	0.1	0.0	0.0	0.0	0.0	0.1
Denied Del/Veh (s)	3.2	0.6	0.0	0.1	0.2	0.2	0.4
Total Delay (hr)	0.1	0.3	0.3	0.1	0.6	0.1	1.5
Total Del/Veh (s)	3.7	2.0	2.6	2.1	22.9	6.4	4.1
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.5	0.1	0.7
Stop Del/Veh (s)	2.5	0.0	0.1	0.1	19.4	4.0	1.8
Total Stops	29	0	0	1	98	54	182
Stop/Veh	0.45	0.00	0.00	0.01	0.96	0.96	0.14
Travel Dist (mi)	17.2	138.7	191.7	52.6	85.2	46.4	531.9
Travel Time (hr)	0.5	2.9	4.7	1.4	3.6	1.7	14.8
Avg Speed (mph)	38	49	41	38	24	27	36
Fuel Used (gal)	0.5	3.9	5.3	1.3	2.5	1.3	14.7
Fuel Eff. (mpg)	35.8	35.3	36.4	40.4	34.5	36.0	36.1
HC Emissions (g)	12	100	125	33	43	22	334
CO Emissions (g)	399	3074	2887	743	683	360	8146
NOx Emissions (g)	38	335	451	112	113	60	1109
Vehicles Entered	64	512	446	122	98	53	1295
Vehicles Exited	64	512	446	122	98	53	1295
Hourly Exit Rate	64	512	446	122	98	53	1295
Input Volume	64	515	442	126	101	53	1301
% of Volume	100	99	101	97	97	100	100
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)							1132
Occupancy (veh)	0	3	5	1	4	2	15

Total Network Performance

Denied Delay (hr)	0.3
Denied Del/Veh (s)	0.7
Total Delay (hr)	5.7
Total Del/Veh (s)	11.4
Stop Delay (hr)	2.0
Stop Del/Veh (s)	4.0
Total Stops	732
Stop/Veh	0.41
Travel Dist (mi)	2435.5
Travel Time (hr)	71.6
Avg Speed (mph)	34
Fuel Used (gal)	74.2
Fuel Eff. (mpg)	32.8
HC Emissions (g)	1621
CO Emissions (g)	41336
NOx Emissions (g)	5231
Vehicles Entered	1721
Vehicles Exited	1724
Hourly Exit Rate	1724
Input Volume	13508
% of Volume	13
Denied Entry Before	0
Denied Entry After	0
Density (ft/veh)	780
Occupancy (veh)	71

Intersection: 402: Vermillion Rd & Eddy St

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	56	15
Average Queue (ft)	4	3
95th Queue (ft)	29	12
Link Distance (ft)	146	1341
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 403: Vermillion Rd & Spring St

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	5	27
Average Queue (ft)	0	2
95th Queue (ft)	6	13
Link Distance (ft)	294	223
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 404: Vermillion Rd & Ashland St

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	59	27
Average Queue (ft)	5	5
95th Queue (ft)	29	18
Link Distance (ft)	674	1649
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 405: Vermillion Rd & Walnut St

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	56	36
Average Queue (ft)	4	9
95th Queue (ft)	26	32
Link Distance (ft)	370	1293
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 406: Maple St & Vermillion Rd

Movement	EB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	40	26
Average Queue (ft)	3	4
95th Queue (ft)	22	19
Link Distance (ft)	289	1233
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 407: Vermillion Rd & Oak St

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	31	33
Average Queue (ft)	1	7
95th Queue (ft)	16	29
Link Distance (ft)	295	998
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 408: Pine St & Vermillion Rd

Movement	EB	WB	SB	SB
Directions Served	L	R	LT	R
Maximum Queue (ft)	54	4	68	71
Average Queue (ft)	16	0	23	29
95th Queue (ft)	43	3	52	56
Link Distance (ft)			1231	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	50	80		50
Storage Blk Time (%)	0		1	1
Queuing Penalty (veh)	2		1	1

Intersection: 409: 31st St & Vermillion Rd

Movement	EB	EB	WB	NB	NB
Directions Served	LT	R	LT	L	TR
Maximum Queue (ft)	21	13	65	97	63
Average Queue (ft)	1	0	20	35	22
95th Queue (ft)	9	7	52	72	49
Link Distance (ft)	510			2426	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		150	125		100
Storage Blk Time (%)				0	
Queuing Penalty (veh)				0	

Intersection: 410: Riverwood Dr & Vermillion Rd

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	49	59
Average Queue (ft)	10	17
95th Queue (ft)	36	41
Link Distance (ft)	510	1440
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 411: Village Tr & Vermillion Rd

Movement	EB	WB	NB
Directions Served	R	L	LR
Maximum Queue (ft)	8	39	81
Average Queue (ft)	0	9	29
95th Queue (ft)	5	31	62
Link Distance (ft)			1781
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	310	150	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 412: Vermillion Rd & Pleasant Dr

Movement	EB	WB	SB	SB
Directions Served	L	R	L	R
Maximum Queue (ft)	56	16	126	62
Average Queue (ft)	18	1	51	22
95th Queue (ft)	46	9	102	47
Link Distance (ft)			4590	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	125	325		150
Storage Blk Time (%)			0	
Queuing Penalty (veh)			0	

Network Summary

Network wide Queuing Penalty: 4

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	7:00	7:00	7:00	7:00	7:00	7:00	7:00
End Time	8:15	8:15	8:15	8:15	8:15	8:15	8:15
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4	4
Volume counts from "S:\2020\200186\TRAFFIC ANALYSIS\SYNCHRO\BUILD\PM PEAK-BUILD 2020.csv" data file(s)							
Volume date = 09/27/2019							
Vehs Entered	1701	1716	1679	1745	1686	1722	1786
Vehs Exited	1704	1720	1676	1734	1674	1708	1777
Starting Vehs	73	85	71	83	80	70	66
Ending Vehs	70	81	74	94	92	84	75
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	1
Travel Distance (mi)	2711	2721	2664	2782	2688	2728	2815
Travel Time (hr)	82.8	83.2	81.3	85.4	81.9	83.6	86.8
Total Delay (hr)	8.9	9.1	8.7	9.8	8.8	9.4	9.8
Total Stops	559	592	578	637	582	641	649
Fuel Used (gal)	85.7	86.8	84.3	88.0	85.6	86.3	89.6

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	7:00	7:00	7:00	7:00
End Time	8:15	8:15	8:15	8:15
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	5	5	5	5
# of Recorded Intervals	4	4	4	4
Volume counts from "S:\2020\200186\TRAFFIC ANALYSIS\SYNCHRO\BUILD\PM PEAK-BUILD 2020.csv" data file(s)				
Volume date = 09/27/2019				
Vehs Entered	1717	1662	1743	1712
Vehs Exited	1712	1657	1739	1710
Starting Vehs	72	78	76	73
Ending Vehs	77	83	80	77
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	1	0
Travel Distance (mi)	2741	2650	2741	2724
Travel Time (hr)	84.2	80.7	84.3	83.4
Total Delay (hr)	9.4	8.5	10.0	9.2
Total Stops	612	534	659	602
Fuel Used (gal)	87.1	83.7	86.5	86.4

Interval #0 Information Seeding

Start Time	7:00
End Time	7:15
Total Time (min)	15

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:15
End Time	7:30
Total Time (min)	15

Run Number	1	2	3	4	5	6	7
Vehs Entered	447	440	432	446	428	429	484
Vehs Exited	443	438	416	434	411	392	454
Starting Vehs	73	85	71	83	80	70	66
Ending Vehs	77	87	87	95	97	107	96
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	2	0	1	0	0	0
Travel Distance (mi)	709	688	675	700	660	648	745
Travel Time (hr)	21.9	21.2	20.8	21.4	20.3	19.8	23.1
Total Delay (hr)	2.5	2.3	2.2	2.5	2.0	2.2	2.6
Total Stops	168	158	175	169	145	170	221
Fuel Used (gal)	22.6	21.9	21.4	22.4	20.9	20.4	23.4

Interval #1 Information Recording

Start Time	7:15
End Time	7:30
Total Time (min)	15

Run Number	8	9	10	Avg
Vehs Entered	463	433	443	446
Vehs Exited	420	429	425	428
Starting Vehs	72	78	76	73
Ending Vehs	115	82	94	91
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0
Travel Distance (mi)	709	707	698	694
Travel Time (hr)	21.9	21.5	21.7	21.4
Total Delay (hr)	2.4	2.3	2.9	2.4
Total Stops	164	137	225	174
Fuel Used (gal)	22.4	22.2	22.0	22.0

Interval #2 Information Recording

Start Time	7:30
End Time	7:45
Total Time (min)	15

Run Number	1	2	3	4	5	6	7
Vehs Entered	442	447	435	452	473	438	457
Vehs Exited	436	460	437	453	482	469	467
Starting Vehs	77	87	87	95	97	107	96
Ending Vehs	83	74	85	94	88	76	86
Denied Entry Before	0	2	0	1	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Travel Distance (mi)	688	706	679	736	763	717	721
Travel Time (hr)	20.8	21.6	20.8	22.7	23.7	22.0	22.1
Total Delay (hr)	2.1	2.4	2.2	2.7	2.8	2.4	2.4
Total Stops	125	183	126	171	195	173	141
Fuel Used (gal)	21.8	22.8	21.6	23.0	24.2	22.9	22.9

Interval #2 Information Recording

Start Time	7:30
End Time	7:45
Total Time (min)	15

Run Number	8	9	10	Avg
Vehs Entered	455	427	440	446
Vehs Exited	484	439	443	454
Starting Vehs	115	82	94	91
Ending Vehs	86	70	91	83
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	1	0
Travel Distance (mi)	732	675	679	709
Travel Time (hr)	22.5	20.5	20.9	21.8
Total Delay (hr)	2.6	2.1	2.4	2.4
Total Stops	174	144	153	158
Fuel Used (gal)	23.4	21.6	21.4	22.5

Interval #3 Information Recording

Start Time	7:45
End Time	8:00
Total Time (min)	15

Run Number	1	2	3	4	5	6	7
Vehs Entered	426	421	405	436	390	453	437
Vehs Exited	435	400	425	448	420	443	430
Starting Vehs	83	74	85	94	88	76	86
Ending Vehs	74	95	65	82	58	86	93
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Travel Distance (mi)	685	658	665	690	639	716	671
Travel Time (hr)	21.0	20.0	20.0	21.2	19.3	22.2	20.8
Total Delay (hr)	2.3	2.2	2.2	2.5	2.0	2.7	2.4
Total Stops	143	115	146	154	139	169	145
Fuel Used (gal)	21.7	21.0	21.2	22.1	20.4	22.3	21.8

Interval #3 Information Recording

Start Time	7:45
End Time	8:00
Total Time (min)	15

Run Number	8	9	10	Avg
Vehs Entered	406	418	441	422
Vehs Exited	417	407	442	425
Starting Vehs	86	70	91	83
Ending Vehs	75	81	90	77
Denied Entry Before	0	0	1	0
Denied Entry After	0	0	0	0
Travel Distance (mi)	664	653	686	673
Travel Time (hr)	20.3	19.9	21.2	20.6
Total Delay (hr)	2.3	2.2	2.6	2.3
Total Stops	155	126	141	142
Fuel Used (gal)	21.1	20.6	21.8	21.4

Interval #4 Information Recording

Start Time	8:00
End Time	8:15
Total Time (min)	15

Run Number	1	2	3	4	5	6	7
Vehs Entered	386	408	407	411	395	402	408
Vehs Exited	390	422	398	399	361	404	426
Starting Vehs	74	95	65	82	58	86	93
Ending Vehs	70	81	74	94	92	84	75
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	1
Travel Distance (mi)	630	669	645	656	626	647	679
Travel Time (hr)	19.2	20.4	19.7	20.0	18.6	19.6	20.7
Total Delay (hr)	2.0	2.1	2.2	2.1	2.0	2.0	2.4
Total Stops	123	136	131	143	103	129	142
Fuel Used (gal)	19.7	21.1	20.0	20.5	20.1	20.7	21.5

Interval #4 Information Recording

Start Time	8:00
End Time	8:15
Total Time (min)	15

Run Number	8	9	10	Avg
Vehs Entered	393	384	419	400
Vehs Exited	391	382	429	400
Starting Vehs	75	81	90	77
Ending Vehs	77	83	80	77
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	1	0
Travel Distance (mi)	637	615	678	648
Travel Time (hr)	19.5	18.8	20.5	19.7
Total Delay (hr)	2.1	2.0	2.2	2.1
Total Stops	119	127	140	127
Fuel Used (gal)	20.2	19.3	21.3	20.4

402: Vermillion Rd & Eddy St Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.4	0.3	0.1	0.1	0.2
Total Delay (hr)	0.0	0.0	0.2	0.0	0.0	0.0	0.3
Total Del/Veh (s)	3.5	0.3	1.5	0.9	12.0	2.2	1.0
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	1.8	0.0	0.0	0.0	10.7	2.8	0.1
Total Stops	6	0	0	0	6	2	14
Stop/Veh	0.38	0.00	0.00	0.00	1.00	1.00	0.01
Travel Dist (mi)	0.6	18.8	171.5	0.5	1.6	0.4	193.4
Travel Time (hr)	0.0	0.6	5.2	0.0	0.1	0.0	5.9
Avg Speed (mph)	15	32	33	32	21	24	33
Fuel Used (gal)	0.0	0.5	4.7	0.0	0.0	0.0	5.3
Fuel Eff. (mpg)	40.5	35.1	36.4	37.3	35.9	38.5	36.3
HC Emissions (g)	0	10	75	0	0	0	85
CO Emissions (g)	4	176	1393	2	3	1	1580
NOx Emissions (g)	1	30	237	0	1	0	269
Vehicles Entered	16	479	441	1	6	2	945
Vehicles Exited	16	479	442	1	6	2	946
Hourly Exit Rate	16	479	442	1	6	2	946
Input Volume	15	489	444	1	7	2	958
% of Volume	107	98	100	100	86	100	99
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)							637
Occupancy (veh)	0	1	5	0	0	0	6

403: Vermillion Rd & Spring St Performance by movement

Movement	EBT	WBT	WBR	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0
Total Delay (hr)	0.1	0.0	0.0	0.0	0.1
Total Del/Veh (s)	0.5	0.3	0.0	3.6	0.4
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.0	0.0	0.0	3.4	0.0
Total Stops	0	0	0	4	4
Stop/Veh	0.00	0.00	0.00	1.00	0.00
Travel Dist (mi)	34.1	18.7	0.2	0.2	53.2
Travel Time (hr)	1.0	0.6	0.0	0.0	1.7
Avg Speed (mph)	33	32	20	13	32
Fuel Used (gal)	0.9	0.5	0.0	0.0	1.4
Fuel Eff. (mpg)	37.8	36.1	82.1	49.6	37.3
HC Emissions (g)	16	8	0	0	24
CO Emissions (g)	254	137	0	0	391
NOx Emissions (g)	51	26	0	0	76
Vehicles Entered	495	440	5	4	944
Vehicles Exited	495	439	5	4	943
Hourly Exit Rate	495	439	5	4	943
Input Volume	504	443	5	3	955
% of Volume	98	99	100	133	99
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0
Density (ft/veh)					487
Occupancy (veh)	1	1	0	0	2

404: Vermillion Rd & Ashland St Performance by movement

Movement	EBT	WBT	WBR	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0
Total Delay (hr)	0.1	0.1	0.0	0.0	0.2
Total Del/Veh (s)	0.7	0.5	0.1	3.1	0.6
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.0	0.0	0.0	3.9	0.0
Total Stops	0	0	0	11	11
Stop/Veh	0.00	0.00	0.00	1.00	0.01
Travel Dist (mi)	68.7	29.0	0.3	3.5	101.5
Travel Time (hr)	2.1	0.9	0.0	0.1	3.1
Avg Speed (mph)	33	32	23	25	32
Fuel Used (gal)	1.8	0.8	0.0	0.1	2.7
Fuel Eff. (mpg)	37.7	35.2	58.8	36.9	37.0
HC Emissions (g)	34	13	0	1	48
CO Emissions (g)	514	244	1	14	773
NOx Emissions (g)	104	41	0	2	148
Vehicles Entered	496	437	5	11	949
Vehicles Exited	495	438	5	11	949
Hourly Exit Rate	495	438	5	11	949
Input Volume	504	440	4	10	958
% of Volume	98	99	125	110	99
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0
Density (ft/veh)					869
Occupancy (veh)	2	1	0	0	3

405: Vermillion Rd & Walnut St Performance by movement

Movement	EBT	WBT	WBR	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0
Total Delay (hr)	0.0	0.1	0.0	0.0	0.2
Total Del/Veh (s)	0.3	1.1	0.5	4.2	0.7
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.0	0.0	0.0	4.1	0.0
Total Stops	0	0	0	5	5
Stop/Veh	0.00	0.00	0.00	1.00	0.01
Travel Dist (mi)	40.2	61.7	1.5	1.3	104.7
Travel Time (hr)	1.2	1.9	0.1	0.1	3.2
Avg Speed (mph)	34	32	27	24	32
Fuel Used (gal)	1.1	1.7	0.0	0.0	2.9
Fuel Eff. (mpg)	38.0	35.8	42.9	39.7	36.7
HC Emissions (g)	21	27	1	0	49
CO Emissions (g)	328	471	12	3	813
NOx Emissions (g)	65	84	2	0	152
Vehicles Entered	496	440	11	5	952
Vehicles Exited	496	441	11	5	953
Hourly Exit Rate	496	441	11	5	953
Input Volume	504	442	10	5	961
% of Volume	98	100	110	100	99
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0
Density (ft/veh)					758
Occupancy (veh)	1	2	0	0	3

406: Maple St & Vermillion Rd Performance by movement

Movement	EBT	WBT	WBR	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0
Total Delay (hr)	0.0	0.1	0.0	0.0	0.1
Total Del/Veh (s)	0.2	0.6	0.2	3.5	0.4
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.0	0.0	0.0	3.6	0.0
Total Stops	0	0	0	6	6
Stop/Veh	0.00	0.00	0.00	1.00	0.01
Travel Dist (mi)	33.1	35.6	0.1	1.3	70.1
Travel Time (hr)	1.0	1.1	0.0	0.1	2.1
Avg Speed (mph)	34	32	24	24	33
Fuel Used (gal)	0.9	1.0	0.0	0.0	1.9
Fuel Eff. (mpg)	37.4	34.9	55.4	38.3	36.1
HC Emissions (g)	22	16	0	0	39
CO Emissions (g)	383	298	0	3	684
NOx Emissions (g)	65	50	0	0	116
Vehicles Entered	496	444	1	6	947
Vehicles Exited	496	444	1	6	947
Hourly Exit Rate	496	444	1	6	947
Input Volume	504	445	1	5	955
% of Volume	98	100	100	120	99
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0
Density (ft/veh)					1124
Occupancy (veh)	1	1	0	0	2

407: Vermillion Rd & Oak St Performance by movement

Movement	EBT	WBT	WBR	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0
Total Delay (hr)	0.1	0.1	0.0	0.0	0.2
Total Del/Veh (s)	0.4	0.8	0.1	4.6	0.6
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.1	0.0	0.0	4.5	0.1
Total Stops	0	0	0	5	5
Stop/Veh	0.00	0.00	0.00	1.00	0.01
Travel Dist (mi)	37.5	29.5	0.4	0.9	68.3
Travel Time (hr)	1.6	1.0	0.0	0.0	2.6
Avg Speed (mph)	23	31	23	22	26
Fuel Used (gal)	2.6	0.7	0.0	0.0	3.3
Fuel Eff. (mpg)	14.3	42.8	63.5	39.0	20.4
HC Emissions (g)	68	11	0	0	79
CO Emissions (g)	2561	191	2	2	2756
NOx Emissions (g)	195	32	0	0	227
Vehicles Entered	514	446	6	5	971
Vehicles Exited	512	445	6	5	968
Hourly Exit Rate	512	445	6	5	968
Input Volume	519	448	5	5	977
% of Volume	99	99	120	100	99
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0
Density (ft/veh)					663
Occupancy (veh)	2	1	0	0	3

408: Pine St & Vermillion Rd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.2	0.2	0.0
Total Delay (hr)	0.1	1.0	0.6	0.0	0.1	0.1	2.0
Total Del/Veh (s)	5.1	8.1	5.5	4.1	4.4	4.2	6.3
Stop Delay (hr)	0.0	0.0	0.1	0.0	0.0	0.0	0.2
Stop Del/Veh (s)	0.3	0.2	0.5	0.6	1.5	1.2	0.5
Total Stops	4	23	42	3	19	25	116
Stop/Veh	0.06	0.05	0.10	0.11	0.31	0.24	0.10
Travel Dist (mi)	16.9	113.9	25.7	1.7	14.0	24.1	196.4
Travel Time (hr)	0.5	3.6	1.4	0.1	0.6	1.0	7.2
Avg Speed (mph)	31	31	19	18	25	25	27
Fuel Used (gal)	0.4	2.8	0.7	0.0	0.4	0.7	5.0
Fuel Eff. (mpg)	41.6	41.2	36.2	35.4	35.3	34.3	39.0
HC Emissions (g)	9	71	10	1	6	11	107
CO Emissions (g)	220	1696	227	18	130	222	2514
NOx Emissions (g)	28	220	32	3	18	31	331
Vehicles Entered	66	455	420	27	60	103	1131
Vehicles Exited	68	454	421	27	60	104	1134
Hourly Exit Rate	68	454	421	27	60	104	1134
Input Volume	65	454	425	27	65	106	1142
% of Volume	105	100	99	100	92	98	99
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)							454
Occupancy (veh)	1	4	1	0	1	1	7

409: 31st St & Vermillion Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.5	0.0	0.2	0.1	0.0	0.2	0.1	0.0
Total Delay (hr)	0.0	0.1	0.0	0.1	0.2	0.4	0.1	0.8
Total Del/Veh (s)	3.3	0.9	0.4	4.2	1.3	18.9	5.5	2.3
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.4
Stop Del/Veh (s)	1.4	0.0	0.0	2.4	0.1	16.6	4.7	1.2
Total Stops	0	0	0	32	3	65	40	140
Stop/Veh	0.00	0.00	0.00	0.52	0.01	0.97	0.98	0.11
Travel Dist (mi)	0.1	49.9	9.8	15.7	121.3	29.8	18.5	245.2
Travel Time (hr)	0.0	1.3	0.4	0.6	3.5	1.4	0.7	7.8
Avg Speed (mph)	24	39	28	28	35	22	26	31
Fuel Used (gal)	0.0	1.7	0.2	0.7	5.7	0.9	0.5	9.6
Fuel Eff. (mpg)	38.1	29.9	49.5	22.7	21.4	33.9	35.3	25.4
HC Emissions (g)	0	43	4	14	135	16	12	223
CO Emissions (g)	1	1281	97	617	5168	268	205	7637
NOx Emissions (g)	0	141	11	43	417	41	32	686
Vehicles Entered	1	489	95	60	474	65	40	1224
Vehicles Exited	1	489	96	61	474	65	40	1226
Hourly Exit Rate	1	489	96	61	474	65	40	1226
Input Volume	1	482	92	58	485	69	42	1229
% of Volume	100	101	104	105	98	94	95	100
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0
Density (ft/veh)								1210
Occupancy (veh)	0	1	0	1	4	1	1	8

410: Riverwood Dr & Vermillion Rd Performance by movement

Movement	EBT	EBR	WBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0
Total Delay (hr)	0.1	0.0	0.1	0.0	0.3
Total Del/Veh (s)	0.9	0.4	0.6	3.7	0.8
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.0	0.0	0.1	4.0	0.1
Total Stops	0	0	0	24	24
Stop/Veh	0.00	0.00	0.00	0.96	0.02
Travel Dist (mi)	84.5	3.7	57.2	6.8	152.2
Travel Time (hr)	2.1	0.1	1.5	0.3	3.9
Avg Speed (mph)	41	34	39	25	39
Fuel Used (gal)	2.3	0.1	2.0	0.2	4.6
Fuel Eff. (mpg)	36.7	44.7	28.5	37.3	33.3
HC Emissions (g)	59	2	48	3	112
CO Emissions (g)	1323	49	1485	48	2905
NOx Emissions (g)	207	6	163	9	385
Vehicles Entered	540	24	552	25	1141
Vehicles Exited	540	24	552	24	1140
Hourly Exit Rate	540	24	552	24	1140
Input Volume	532	23	562	23	1140
% of Volume	101	104	98	104	100
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0
Density (ft/veh)					918
Occupancy (veh)	2	0	1	0	4

411: Village Tr & Vermillion Rd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.1	0.0	0.2	0.2	0.0
Total Delay (hr)	0.3	0.0	0.0	0.1	0.3	0.0	0.9
Total Del/Veh (s)	1.9	1.5	3.4	1.0	17.4	8.3	2.5
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.3	0.0	0.4
Stop Del/Veh (s)	0.1	0.1	2.0	0.0	15.3	8.2	1.1
Total Stops	1	0	24	0	65	21	111
Stop/Veh	0.00	0.00	0.48	0.00	0.98	1.00	0.09
Travel Dist (mi)	241.8	34.9	7.7	76.2	22.2	7.1	389.9
Travel Time (hr)	6.5	1.0	0.3	1.8	1.1	0.3	11.1
Avg Speed (mph)	37	35	29	41	20	23	35
Fuel Used (gal)	9.2	1.3	0.2	2.0	0.7	0.2	13.6
Fuel Eff. (mpg)	26.2	27.2	46.8	37.6	33.2	35.3	28.7
HC Emissions (g)	243	36	3	44	11	4	341
CO Emissions (g)	7854	1152	69	1008	202	74	10359
NOx Emissions (g)	772	108	11	162	29	11	1092
Vehicles Entered	548	79	50	495	65	21	1258
Vehicles Exited	549	78	50	496	65	21	1259
Hourly Exit Rate	549	78	50	496	65	21	1259
Input Volume	541	80	53	502	65	19	1260
% of Volume	101	98	94	99	100	111	100
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)							720
Occupancy (veh)	7	1	0	2	1	0	11

412: Vermillion Rd & Pleasant Dr Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Delay (hr)	0.0	0.1	0.0	0.0	0.0	0.0	0.1
Denied Del/Veh (s)	0.4	0.5	0.0	0.0	0.2	0.2	0.2
Total Delay (hr)	0.1	1.7	1.2	0.2	0.1	0.1	3.4
Total Del/Veh (s)	7.3	11.5	9.5	6.9	5.1	4.2	9.4
Stop Delay (hr)	0.0	0.1	0.1	0.0	0.0	0.0	0.3
Stop Del/Veh (s)	0.7	0.6	0.6	0.6	1.6	0.9	0.7
Total Stops	9	55	44	12	31	12	163
Stop/Veh	0.13	0.10	0.10	0.10	0.32	0.21	0.12
Travel Dist (mi)	24.6	197.5	185.7	51.5	40.1	23.8	523.2
Travel Time (hr)	0.7	5.4	5.4	1.5	1.5	0.9	15.4
Avg Speed (mph)	37	37	34	34	26	27	34
Fuel Used (gal)	0.6	4.7	4.5	1.3	1.1	0.7	12.8
Fuel Eff. (mpg)	42.3	42.2	41.3	41.1	35.9	35.7	40.9
HC Emissions (g)	14	122	90	30	19	14	290
CO Emissions (g)	422	3516	2064	654	333	250	7238
NOx Emissions (g)	45	369	319	102	53	40	928
Vehicles Entered	66	529	440	120	95	57	1307
Vehicles Exited	66	528	440	120	96	57	1307
Hourly Exit Rate	66	528	440	120	96	57	1307
Input Volume	65	522	440	127	94	51	1299
% of Volume	102	101	100	94	102	112	101
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)							422
Occupancy (veh)	1	5	5	2	2	1	15

Total Network Performance

Denied Delay (hr)	0.2
Denied Del/Veh (s)	0.4
Total Delay (hr)	9.1
Total Del/Veh (s)	18.3
Stop Delay (hr)	1.4
Stop Del/Veh (s)	2.7
Total Stops	602
Stop/Veh	0.34
Travel Dist (mi)	2724.2
Travel Time (hr)	83.4
Avg Speed (mph)	33
Fuel Used (gal)	86.4
Fuel Eff. (mpg)	31.5
HC Emissions (g)	1888
CO Emissions (g)	52915
NOx Emissions (g)	5883
Vehicles Entered	1712
Vehicles Exited	1710
Hourly Exit Rate	1710
Input Volume	13438
% of Volume	13
Denied Entry Before	0
Denied Entry After	0
Density (ft/veh)	536
Occupancy (veh)	83

Intersection: 402: Vermillion Rd & Eddy St

Movement	EB	EB	SB
Directions Served	L	T	LR
Maximum Queue (ft)	35	4	16
Average Queue (ft)	6	0	3
95th Queue (ft)	27	0	12
Link Distance (ft)		151	1332
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	125		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 403: Vermillion Rd & Spring St

Movement	SB
Directions Served	R
Maximum Queue (ft)	30
Average Queue (ft)	4
95th Queue (ft)	21
Link Distance (ft)	216
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 404: Vermillion Rd & Ashland St

Movement	SB
Directions Served	R
Maximum Queue (ft)	16
Average Queue (ft)	4
95th Queue (ft)	12
Link Distance (ft)	1652
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 405: Vermillion Rd & Walnut St

Movement	SB
Directions Served	R
Maximum Queue (ft)	31
Average Queue (ft)	5
95th Queue (ft)	22
Link Distance (ft)	1293
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 406: Maple St & Vermillion Rd

Movement	SB
Directions Served	R
Maximum Queue (ft)	27
Average Queue (ft)	4
95th Queue (ft)	20
Link Distance (ft)	1233
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 407: Vermillion Rd & Oak St

Movement	SB
Directions Served	R
Maximum Queue (ft)	30
Average Queue (ft)	4
95th Queue (ft)	21
Link Distance (ft)	998
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 408: Pine St & Vermillion Rd

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	87	117	94
Average Queue (ft)	19	29	30
95th Queue (ft)	62	84	72
Link Distance (ft)	1280	269	1227
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 409: 31st St & Vermillion Rd

Movement	EB	EB	EB	WB	NB	NB
Directions Served	L	T	R	L	L	TR
Maximum Queue (ft)	5	5	12	52	96	56
Average Queue (ft)	0	0	0	18	35	18
95th Queue (ft)	5	0	8	45	72	43
Link Distance (ft)		504			2421	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	175		175	250		100
Storage Blk Time (%)					0	0
Queuing Penalty (veh)					0	0

Intersection: 410: Riverwood Dr & Vermillion Rd

Movement	NB
Directions Served	R
Maximum Queue (ft)	41
Average Queue (ft)	11
95th Queue (ft)	31
Link Distance (ft)	1441
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 411: Village Tr & Vermillion Rd

Movement	EB	WB	NB
Directions Served	R	L	LR
Maximum Queue (ft)	2	53	94
Average Queue (ft)	0	16	35
95th Queue (ft)	0	43	72
Link Distance (ft)			1781
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	310	150	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 412: Vermillion Rd & Pleasant Dr

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	122	122	91
Average Queue (ft)	33	32	29
95th Queue (ft)	87	90	69
Link Distance (ft)	1972	2213	2212
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	7:00	7:00	7:00	7:00	7:00	7:00	7:00
End Time	8:15	8:15	8:15	8:15	8:15	8:15	8:15
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4	4
Volume counts from "S:\2020\200186\TRAFFIC ANALYSIS\VOLS\PM PEAK.csv" data file(s)							
Volume date = 09/27/2019							
Vehs Entered	1697	1693	1734	1732	1760	1756	1747
Vehs Exited	1701	1698	1757	1733	1768	1752	1750
Starting Vehs	59	75	79	73	67	66	73
Ending Vehs	55	70	56	72	59	70	70
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	1	0	1	0	0	0	0
Travel Distance (mi)	2374	2404	2459	2431	2491	2490	2474
Travel Time (hr)	70.0	70.6	72.1	71.9	73.1	73.1	73.0
Total Delay (hr)	5.6	5.7	6.0	6.0	6.3	6.4	6.4
Total Stops	717	739	712	765	711	742	745
Fuel Used (gal)	73.2	72.9	74.8	74.4	75.5	76.0	75.5

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	7:00	7:00	7:00	7:00
End Time	8:15	8:15	8:15	8:15
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	5	5	5	5
# of Recorded Intervals	4	4	4	4
Volume counts from "S:\2020\200186\TRAFFIC ANALYSIS\VOLS\PM PEAK.csv" data file(s)				
Volume date = 09/27/2019				
Vehs Entered	1705	1738	1647	1721
Vehs Exited	1674	1738	1660	1724
Starting Vehs	53	68	74	65
Ending Vehs	84	68	61	63
Denied Entry Before	0	1	0	0
Denied Entry After	0	0	0	0
Travel Distance (mi)	2386	2460	2387	2436
Travel Time (hr)	70.7	71.9	69.6	71.6
Total Delay (hr)	6.0	5.9	5.7	6.0
Total Stops	774	693	701	732
Fuel Used (gal)	72.9	74.8	72.1	74.2

Interval #0 Information Seeding

Start Time	7:00
End Time	7:15
Total Time (min)	15

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:15
End Time	7:30
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	412	470	433	467	447	436	415
Vehs Exited	407	466	455	470	427	425	403
Starting Vehs	59	75	79	73	67	66	73
Ending Vehs	64	79	57	70	87	77	85
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	1	0	0	0	0
Travel Distance (mi)	573	672	630	673	632	611	589
Travel Time (hr)	16.9	20.0	18.7	19.9	18.5	18.0	17.2
Total Delay (hr)	1.2	1.7	1.5	1.7	1.5	1.5	1.4
Total Stops	171	219	185	210	164	180	181
Fuel Used (gal)	17.6	20.5	19.2	20.3	18.8	18.5	17.8

Interval #1 Information Recording

Start Time	7:15
End Time	7:30
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	420	450	422	438
Vehs Exited	403	430	422	432
Starting Vehs	53	68	74	65
Ending Vehs	70	88	74	72
Denied Entry Before	0	1	0	0
Denied Entry After	0	0	0	0
Travel Distance (mi)	570	634	619	620
Travel Time (hr)	16.8	18.5	18.2	18.3
Total Delay (hr)	1.2	1.5	1.5	1.5
Total Stops	181	172	173	184
Fuel Used (gal)	17.5	19.4	18.7	18.8

Interval #2 Information Recording

Start Time	7:30
End Time	7:45
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	457	422	453	413	466	476	457
Vehs Exited	459	427	438	416	470	466	463
Starting Vehs	64	79	57	70	87	77	85
Ending Vehs	62	74	72	67	83	87	79
Denied Entry Before	0	0	1	0	0	0	0
Denied Entry After	1	0	0	0	0	0	1
Travel Distance (mi)	656	595	619	562	657	686	656
Travel Time (hr)	19.5	17.6	18.0	16.5	19.5	20.3	19.5
Total Delay (hr)	1.6	1.4	1.4	1.3	1.6	1.7	1.7
Total Stops	183	193	168	158	209	210	181
Fuel Used (gal)	20.2	18.1	18.7	17.1	20.3	21.1	20.3

Interval #2 Information Recording

Start Time	7:30
End Time	7:45
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	466	441	416	444
Vehs Exited	461	456	422	447
Starting Vehs	70	88	74	72
Ending Vehs	75	73	68	68
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0
Travel Distance (mi)	665	632	608	634
Travel Time (hr)	20.0	18.5	17.8	18.7
Total Delay (hr)	1.8	1.6	1.4	1.6
Total Stops	223	171	188	185
Fuel Used (gal)	20.3	19.2	18.3	19.4

Interval #3 Information Recording

Start Time	7:45
End Time	8:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	432	385	435	418	437	410	454
Vehs Exited	426	403	432	403	458	422	458
Starting Vehs	62	74	72	67	83	87	79
Ending Vehs	68	56	75	82	62	75	75
Denied Entry Before	1	0	0	0	0	0	1
Denied Entry After	0	1	0	1	0	2	0
Travel Distance (mi)	584	565	615	575	635	574	624
Travel Time (hr)	17.1	16.4	17.9	17.0	18.6	16.6	18.6
Total Delay (hr)	1.4	1.3	1.5	1.4	1.7	1.4	1.6
Total Stops	185	152	169	190	179	164	209
Fuel Used (gal)	18.0	16.9	18.5	17.7	19.2	17.3	19.0

Interval #3 Information Recording

Start Time	7:45
End Time	8:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	378	421	420	417
Vehs Exited	384	434	414	422
Starting Vehs	75	73	68	68
Ending Vehs	69	60	74	64
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0
Travel Distance (mi)	532	607	594	590
Travel Time (hr)	15.4	17.6	17.2	17.2
Total Delay (hr)	1.2	1.5	1.4	1.4
Total Stops	170	177	167	175
Fuel Used (gal)	16.3	18.2	18.0	17.9

Interval #4 Information Recording

Start Time	8:00
End Time	8:15
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	396	416	413	434	410	434	421
Vehs Exited	409	402	432	444	413	439	426
Starting Vehs	68	56	75	82	62	75	75
Ending Vehs	55	70	56	72	59	70	70
Denied Entry Before	0	1	0	1	0	2	0
Denied Entry After	1	0	1	0	0	0	0
Travel Distance (mi)	561	572	595	621	566	619	606
Travel Time (hr)	16.5	16.7	17.5	18.4	16.6	18.2	17.7
Total Delay (hr)	1.4	1.3	1.5	1.5	1.5	1.7	1.6
Total Stops	178	175	190	207	159	188	174
Fuel Used (gal)	17.4	17.4	18.4	19.2	17.2	19.1	18.4

Interval #4 Information Recording

Start Time	8:00
End Time	8:15
Total Time (min)	15

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	441	426	389	419
Vehs Exited	426	418	402	419
Starting Vehs	69	60	74	64
Ending Vehs	84	68	61	63
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0
Travel Distance (mi)	618	588	566	591
Travel Time (hr)	18.5	17.3	16.4	17.4
Total Delay (hr)	1.9	1.4	1.3	1.5
Total Stops	200	173	173	184
Fuel Used (gal)	18.8	18.0	17.1	18.1

402: Vermillion Rd & Eddy St Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.3	0.4	0.1	0.1	0.2
Total Delay (hr)	0.0	0.1	0.0	0.0	0.0	0.0	0.1
Total Del/Veh (s)	2.9	0.4	0.3	0.1	10.6	4.0	0.4
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	1.3	0.0	0.0	0.0	9.0	4.6	0.1
Total Stops	3	2	0	0	4	3	12
Stop/Veh	0.33	0.00	0.00	0.00	1.00	1.00	0.01
Travel Dist (mi)	0.3	18.3	20.2	0.0	1.1	0.7	40.7
Travel Time (hr)	0.0	0.6	0.7	0.0	0.1	0.0	1.3
Avg Speed (mph)	15	31	33	20	22	24	31
Fuel Used (gal)	0.0	0.5	0.9	0.0	0.0	0.0	1.5
Fuel Eff. (mpg)	39.3	35.7	21.3	58.3	36.3	38.3	26.8
HC Emissions (g)	0	10	23	0	0	0	33
CO Emissions (g)	2	154	881	0	2	1	1042
NOx Emissions (g)	0	29	63	0	0	0	93
Vehicles Entered	9	481	434	1	4	3	932
Vehicles Exited	9	481	434	1	4	3	932
Hourly Exit Rate	9	481	434	1	4	3	932
Input Volume	10	483	448	1	6	2	950
% of Volume	90	100	97	100	67	150	98
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)							1365
Occupancy (veh)	0	1	1	0	0	0	1

403: Vermillion Rd & Spring St Performance by movement

Movement	EBL	EBT	WBT	WBR	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)		0.0	0.0	0.0	0.1	0.0
Total Delay (hr)	0.0	0.1	0.0	0.0	0.0	0.1
Total Del/Veh (s)		0.6	0.2	0.0	2.8	0.4
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)		0.0	0.0	0.0	2.6	0.0
Total Stops	0	0	0	0	2	2
Stop/Veh		0.00	0.00	0.00	1.00	0.00
Travel Dist (mi)	0.0	33.7	17.7	0.2	0.1	51.6
Travel Time (hr)	0.0	1.1	0.5	0.0	0.0	1.6
Avg Speed (mph)	19	32	33	19	13	32
Fuel Used (gal)	0.0	1.0	0.5	0.0	0.0	1.5
Fuel Eff. (mpg)	54.5	35.2	35.7	79.4	51.7	35.4
HC Emissions (g)	0	17	10	0	0	26
CO Emissions (g)	0	308	175	0	0	484
NOx Emissions (g)	0	52	31	0	0	83
Vehicles Entered	0	490	434	4	2	930
Vehicles Exited	0	490	435	4	2	931
Hourly Exit Rate	0	490	435	4	2	931
Input Volume	0	492	447	5	3	947
% of Volume		100	97	80	67	98
Denied Entry Before	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0
Density (ft/veh)						502
Occupancy (veh)	0	1	1	0	0	2

404: Vermillion Rd & Ashland St Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Delay (hr)	0.0	0.2	0.0	0.0	0.0	0.0	0.2
Total Del/Veh (s)	3.8	1.1	0.3	0.0	10.4	4.4	0.9
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	1.3	0.0	0.0	0.0	9.1	5.0	0.1
Total Stops	4	2	0	0	5	10	21
Stop/Veh	0.36	0.00	0.00	0.00	1.00	0.91	0.02
Travel Dist (mi)	1.5	67.3	28.4	0.2	1.4	3.4	102.3
Travel Time (hr)	0.1	2.1	0.9	0.0	0.1	0.1	3.2
Avg Speed (mph)	25	32	33	23	22	25	32
Fuel Used (gal)	0.0	1.9	0.8	0.0	0.0	0.1	2.8
Fuel Eff. (mpg)	39.0	36.1	36.2	63.0	37.9	36.9	36.3
HC Emissions (g)	0	33	16	0	0	2	50
CO Emissions (g)	6	552	284	0	3	29	873
NOx Emissions (g)	1	101	48	0	0	5	156
Vehicles Entered	11	486	430	3	4	11	945
Vehicles Exited	11	485	431	3	5	10	945
Hourly Exit Rate	11	485	431	3	5	10	945
Input Volume	10	487	444	4	5	10	960
% of Volume	110	100	97	75	100	100	98
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)							842
Occupancy (veh)	0	2	1	0	0	0	3

405: Vermillion Rd & Walnut St Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Delay (hr)	0.0	0.1	0.1	0.0	0.0	0.0	0.2
Total Del/Veh (s)	3.2	0.6	0.7	0.4	9.3	3.4	0.8
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	1.2	0.0	0.0	0.0	7.5	3.2	0.1
Total Stops	3	1	0	0	6	5	15
Stop/Veh	0.33	0.00	0.00	0.00	1.00	1.00	0.02
Travel Dist (mi)	0.7	40.3	60.6	1.4	1.5	1.2	105.7
Travel Time (hr)	0.0	1.3	1.8	0.1	0.1	0.0	3.3
Avg Speed (mph)	21	32	33	28	22	25	32
Fuel Used (gal)	0.0	1.1	1.7	0.0	0.0	0.0	2.9
Fuel Eff. (mpg)	43.6	36.2	36.2	44.7	36.1	38.8	36.4
HC Emissions (g)	0	19	31	1	0	0	52
CO Emissions (g)	2	327	542	14	6	3	895
NOx Emissions (g)	0	60	97	2	1	0	161
Vehicles Entered	9	490	433	10	6	5	953
Vehicles Exited	9	491	433	10	6	5	954
Hourly Exit Rate	9	491	433	10	6	5	954
Input Volume	7	490	446	10	7	5	965
% of Volume	129	100	97	100	86	100	99
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)							747
Occupancy (veh)	0	1	2	0	0	0	3

406: Maple St & Vermillion Rd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Delay (hr)	0.0	0.1	0.1	0.0	0.0	0.0	0.1
Total Del/Veh (s)	3.2	0.4	0.5	0.3	8.4	3.3	0.5
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	1.4	0.0	0.0	0.0	7.0	3.4	0.0
Total Stops	3	1	0	0	1	4	9
Stop/Veh	0.50	0.00	0.00	0.00	1.00	1.00	0.01
Travel Dist (mi)	0.4	32.7	35.3	0.2	0.2	0.9	69.6
Travel Time (hr)	0.0	1.0	1.1	0.0	0.0	0.0	2.2
Avg Speed (mph)	20	32	33	24	21	24	32
Fuel Used (gal)	0.0	0.9	1.0	0.0	0.0	0.0	1.9
Fuel Eff. (mpg)	46.8	36.1	35.3	47.9	36.9	38.6	35.8
HC Emissions (g)	0	16	18	0	0	0	34
CO Emissions (g)	1	284	331	0	1	2	619
NOx Emissions (g)	0	50	56	0	0	0	107
Vehicles Entered	6	498	435	2	1	4	946
Vehicles Exited	6	498	435	2	1	4	946
Hourly Exit Rate	6	498	435	2	1	4	946
Input Volume	7	496	449	2	1	4	959
% of Volume	86	100	97	100	100	100	99
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)							1118
Occupancy (veh)	0	1	1	0	0	0	2

407: Vermillion Rd & Oak St Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.1	0.1	0.0
Total Delay (hr)	0.0	0.1	0.1	0.0	0.0	0.0	0.1
Total Del/Veh (s)	2.7	0.4	0.5	0.1	9.9	3.1	0.5
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	1.4	0.1	0.0	0.0	8.1	3.1	0.1
Total Stops	1	1	0	0	4	3	9
Stop/Veh	0.25	0.00	0.00	0.00	1.00	1.00	0.01
Travel Dist (mi)	0.2	34.0	28.6	0.5	0.8	0.6	64.7
Travel Time (hr)	0.0	1.1	0.9	0.0	0.0	0.0	2.1
Avg Speed (mph)	20	31	32	23	20	24	31
Fuel Used (gal)	0.0	1.0	0.8	0.0	0.0	0.0	1.9
Fuel Eff. (mpg)	42.8	32.4	36.0	59.4	37.2	39.6	34.2
HC Emissions (g)	0	20	14	0	0	0	34
CO Emissions (g)	1	476	263	2	1	1	745
NOx Emissions (g)	0	60	45	0	0	0	105
Vehicles Entered	4	501	437	7	4	3	956
Vehicles Exited	4	500	437	7	4	3	955
Hourly Exit Rate	4	500	437	7	4	3	955
Input Volume	4	500	450	8	4	3	969
% of Volume	100	100	97	88	100	100	99
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)							822
Occupancy (veh)	0	1	1	0	0	0	2

408: Pine St & Vermillion Rd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.4	2.8	0.3
Total Delay (hr)	0.1	0.3	0.1	0.0	0.2	0.2	0.8
Total Del/Veh (s)	3.9	1.9	0.7	0.2	14.5	5.2	2.4
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.2	0.2	0.4
Stop Del/Veh (s)	2.0	0.1	0.0	0.0	12.4	4.8	1.1
Total Stops	24	0	0	0	48	116	188
Stop/Veh	0.44	0.00	0.00	0.00	1.00	0.99	0.17
Travel Dist (mi)	13.9	118.2	27.7	1.6	11.1	27.4	199.9
Travel Time (hr)	0.4	3.0	0.9	0.1	0.6	1.3	6.3
Avg Speed (mph)	32	40	31	23	19	23	32
Fuel Used (gal)	0.4	3.2	0.9	0.0	0.3	0.8	5.6
Fuel Eff. (mpg)	37.7	37.0	32.3	56.9	33.5	33.9	35.8
HC Emissions (g)	8	81	17	1	4	14	124
CO Emissions (g)	200	2029	370	10	87	269	2964
NOx Emissions (g)	27	270	52	1	12	36	399
Vehicles Entered	55	465	418	24	47	116	1125
Vehicles Exited	54	465	418	24	48	116	1125
Hourly Exit Rate	54	465	418	24	48	116	1125
Input Volume	57	462	428	27	49	112	1135
% of Volume	95	101	98	89	98	104	99
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)							997
Occupancy (veh)	0	3	1	0	1	1	6

409: 31st St & Vermillion Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.4	0.0	0.1	0.3	0.0	0.2	0.2	0.1
Total Delay (hr)	0.0	0.1	0.0	0.1	0.2	0.3	0.1	0.9
Total Del/Veh (s)	5.2	1.0	0.5	4.8	1.7	16.3	5.4	2.5
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.4
Stop Del/Veh (s)	3.4	0.0	0.0	2.7	0.1	14.0	4.5	1.2
Total Stops	1	0	1	31	1	72	51	157
Stop/Veh	1.00	0.00	0.01	0.48	0.00	0.96	0.98	0.12
Travel Dist (mi)	0.1	50.9	8.3	15.8	122.3	33.5	23.7	254.7
Travel Time (hr)	0.0	1.3	0.3	0.5	3.2	1.5	0.9	7.8
Avg Speed (mph)	22	39	28	30	38	22	26	33
Fuel Used (gal)	0.0	1.7	0.2	0.6	4.9	1.0	0.7	8.9
Fuel Eff. (mpg)	41.8	30.4	47.9	27.9	25.2	34.1	35.2	28.5
HC Emissions (g)	0	39	4	12	124	16	16	211
CO Emissions (g)	1	1198	95	433	4155	277	258	6417
NOx Emissions (g)	0	133	11	38	400	44	41	667
Vehicles Entered	1	496	79	64	498	73	52	1263
Vehicles Exited	1	496	79	63	497	73	51	1260
Hourly Exit Rate	1	496	79	63	497	73	51	1260
Input Volume	1	500	82	64	503	74	47	1271
% of Volume	100	99	96	98	99	99	109	99
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0
Density (ft/veh)								1147
Occupancy (veh)	0	1	0	1	3	1	1	8

410: Riverwood Dr & Vermillion Rd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Delay (hr)	0.1	0.0	0.0	0.1	0.1	0.0	0.4
Total Del/Veh (s)	1.0	0.4	3.6	0.7	11.1	4.3	1.1
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Stop Del/Veh (s)	0.0	0.0	2.3	0.1	9.4	4.3	0.3
Total Stops	0	0	13	0	17	23	53
Stop/Veh	0.00	0.00	0.48	0.00	1.00	0.96	0.04
Travel Dist (mi)	83.8	4.2	2.9	57.5	4.6	6.4	159.4
Travel Time (hr)	2.1	0.1	0.1	1.5	0.2	0.3	4.3
Avg Speed (mph)	41	34	24	39	21	24	37
Fuel Used (gal)	2.3	0.1	0.1	2.1	0.1	0.2	4.8
Fuel Eff. (mpg)	36.6	45.8	31.7	27.8	35.9	35.2	32.9
HC Emissions (g)	54	2	2	53	1	4	116
CO Emissions (g)	1241	58	65	1593	22	65	3044
NOx Emissions (g)	194	7	5	175	3	10	395
Vehicles Entered	540	27	27	551	16	23	1184
Vehicles Exited	540	28	27	552	17	23	1187
Hourly Exit Rate	540	28	27	552	17	23	1187
Input Volume	547	26	29	556	17	24	1199
% of Volume	99	108	93	99	100	96	99
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)							976
Occupancy (veh)	2	0	0	1	0	0	4

411: Village Tr & Vermillion Rd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.1	0.0	0.1	0.1	0.0
Total Delay (hr)	0.3	0.0	0.0	0.1	0.2	0.0	0.8
Total Del/Veh (s)	2.0	1.6	3.6	0.9	13.8	7.7	2.2
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.2	0.0	0.3
Stop Del/Veh (s)	0.1	0.1	2.5	0.0	11.9	7.5	0.8
Total Stops	0	0	10	0	56	18	84
Stop/Veh	0.00	0.00	0.50	0.00	0.98	1.00	0.07
Travel Dist (mi)	238.1	29.2	3.1	79.3	19.1	6.0	374.9
Travel Time (hr)	5.8	0.8	0.1	1.9	0.9	0.3	9.7
Avg Speed (mph)	41	38	28	41	22	23	39
Fuel Used (gal)	6.6	0.7	0.1	2.2	0.6	0.2	10.3
Fuel Eff. (mpg)	36.1	39.3	43.4	36.3	34.3	34.4	36.3
HC Emissions (g)	159	16	1	54	7	3	240
CO Emissions (g)	3744	397	28	1238	135	47	5589
NOx Emissions (g)	570	58	4	192	20	7	851
Vehicles Entered	552	67	20	518	56	18	1231
Vehicles Exited	553	67	20	518	56	18	1232
Hourly Exit Rate	553	67	20	518	56	18	1232
Input Volume	560	66	22	519	56	17	1240
% of Volume	99	102	91	100	100	106	99
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)							814
Occupancy (veh)	6	1	0	2	1	0	10

412: Vermillion Rd & Pleasant Dr Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Delay (hr)	0.1	0.1	0.0	0.0	0.0	0.0	0.1
Denied Del/Veh (s)	3.2	0.6	0.0	0.1	0.2	0.2	0.4
Total Delay (hr)	0.1	0.3	0.3	0.1	0.6	0.1	1.5
Total Del/Veh (s)	3.7	2.0	2.6	2.1	22.9	6.4	4.1
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.5	0.1	0.7
Stop Del/Veh (s)	2.5	0.0	0.1	0.1	19.4	4.0	1.8
Total Stops	29	0	0	1	98	54	182
Stop/Veh	0.45	0.00	0.00	0.01	0.96	0.96	0.14
Travel Dist (mi)	17.2	138.7	191.7	52.6	85.2	46.4	531.9
Travel Time (hr)	0.5	2.9	4.7	1.4	3.6	1.7	14.8
Avg Speed (mph)	38	49	41	38	24	27	36
Fuel Used (gal)	0.5	3.9	5.3	1.3	2.5	1.3	14.7
Fuel Eff. (mpg)	35.8	35.3	36.4	40.4	34.5	36.0	36.1
HC Emissions (g)	12	100	125	33	43	22	334
CO Emissions (g)	399	3074	2887	743	683	360	8146
NOx Emissions (g)	38	335	451	112	113	60	1109
Vehicles Entered	64	512	446	122	98	53	1295
Vehicles Exited	64	512	446	122	98	53	1295
Hourly Exit Rate	64	512	446	122	98	53	1295
Input Volume	64	515	442	126	101	53	1301
% of Volume	100	99	101	97	97	100	100
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)							1132
Occupancy (veh)	0	3	5	1	4	2	15

Total Network Performance

Denied Delay (hr)	0.3
Denied Del/Veh (s)	0.7
Total Delay (hr)	5.7
Total Del/Veh (s)	11.4
Stop Delay (hr)	2.0
Stop Del/Veh (s)	4.0
Total Stops	732
Stop/Veh	0.41
Travel Dist (mi)	2435.5
Travel Time (hr)	71.6
Avg Speed (mph)	34
Fuel Used (gal)	74.2
Fuel Eff. (mpg)	32.8
HC Emissions (g)	1621
CO Emissions (g)	41336
NOx Emissions (g)	5231
Vehicles Entered	1721
Vehicles Exited	1724
Hourly Exit Rate	1724
Input Volume	13508
% of Volume	13
Denied Entry Before	0
Denied Entry After	0
Density (ft/veh)	780
Occupancy (veh)	71

Intersection: 402: Vermillion Rd & Eddy St

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	56	15
Average Queue (ft)	4	3
95th Queue (ft)	29	12
Link Distance (ft)	146	1341
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 403: Vermillion Rd & Spring St

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	5	27
Average Queue (ft)	0	2
95th Queue (ft)	6	13
Link Distance (ft)	294	223
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 404: Vermillion Rd & Ashland St

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	59	27
Average Queue (ft)	5	5
95th Queue (ft)	29	18
Link Distance (ft)	674	1649
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 405: Vermillion Rd & Walnut St

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	56	36
Average Queue (ft)	4	9
95th Queue (ft)	26	32
Link Distance (ft)	370	1293
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 406: Maple St & Vermillion Rd

Movement	EB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	40	26
Average Queue (ft)	3	4
95th Queue (ft)	22	19
Link Distance (ft)	289	1233
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 407: Vermillion Rd & Oak St

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	31	33
Average Queue (ft)	1	7
95th Queue (ft)	16	29
Link Distance (ft)	295	998
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 408: Pine St & Vermillion Rd

Movement	EB	WB	SB	SB
Directions Served	L	R	LT	R
Maximum Queue (ft)	54	4	68	71
Average Queue (ft)	16	0	23	29
95th Queue (ft)	43	3	52	56
Link Distance (ft)			1231	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	50	80		50
Storage Blk Time (%)	0		1	1
Queuing Penalty (veh)	2		1	1

Intersection: 409: 31st St & Vermillion Rd

Movement	EB	EB	WB	NB	NB
Directions Served	LT	R	LT	L	TR
Maximum Queue (ft)	21	13	65	97	63
Average Queue (ft)	1	0	20	35	22
95th Queue (ft)	9	7	52	72	49
Link Distance (ft)	510			2426	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		150	125		100
Storage Blk Time (%)				0	
Queuing Penalty (veh)				0	

Intersection: 410: Riverwood Dr & Vermillion Rd

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	49	59
Average Queue (ft)	10	17
95th Queue (ft)	36	41
Link Distance (ft)	510	1440
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 411: Village Tr & Vermillion Rd

Movement	EB	WB	NB
Directions Served	R	L	LR
Maximum Queue (ft)	8	39	81
Average Queue (ft)	0	9	29
95th Queue (ft)	5	31	62
Link Distance (ft)			1781
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	310	150	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 412: Vermillion Rd & Pleasant Dr

Movement	EB	WB	SB	SB
Directions Served	L	R	L	R
Maximum Queue (ft)	56	16	126	62
Average Queue (ft)	18	1	51	22
95th Queue (ft)	46	9	102	47
Link Distance (ft)			4590	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	125	325		150
Storage Blk Time (%)			0	
Queuing Penalty (veh)			0	

Network Summary

Network wide Queuing Penalty: 4

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	7:00	7:00	7:00	7:00	7:00	7:00	7:00
End Time	8:15	8:15	8:15	8:15	8:15	8:15	8:15
Total Time (min)	75	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4	4
Volume counts from "S:\2020\200186\TRAFFIC ANALYSIS\SYNCHRO\BUILD\PM PEAK-BUILD 2020.csv" data file(s)							
Volume date = 09/27/2019							
Vehs Entered	1701	1716	1679	1745	1686	1722	1786
Vehs Exited	1704	1720	1676	1734	1674	1708	1777
Starting Vehs	73	85	71	83	80	70	66
Ending Vehs	70	81	74	94	92	84	75
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	1
Travel Distance (mi)	2711	2721	2664	2782	2688	2728	2815
Travel Time (hr)	82.8	83.2	81.3	85.4	81.9	83.6	86.8
Total Delay (hr)	8.9	9.1	8.7	9.8	8.8	9.4	9.8
Total Stops	559	592	578	637	582	641	649
Fuel Used (gal)	85.7	86.8	84.3	88.0	85.6	86.3	89.6

Summary of All Intervals

Run Number	8	9	10	Avg
Start Time	7:00	7:00	7:00	7:00
End Time	8:15	8:15	8:15	8:15
Total Time (min)	75	75	75	75
Time Recorded (min)	60	60	60	60
# of Intervals	5	5	5	5
# of Recorded Intervals	4	4	4	4
Volume counts from "S:\2020\200186\TRAFFIC ANALYSIS\SYNCHRO\BUILD\PM PEAK-BUILD 2020.csv" data file(s)				
Volume date = 09/27/2019				
Vehs Entered	1717	1662	1743	1712
Vehs Exited	1712	1657	1739	1710
Starting Vehs	72	78	76	73
Ending Vehs	77	83	80	77
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	1	0
Travel Distance (mi)	2741	2650	2741	2724
Travel Time (hr)	84.2	80.7	84.3	83.4
Total Delay (hr)	9.4	8.5	10.0	9.2
Total Stops	612	534	659	602
Fuel Used (gal)	87.1	83.7	86.5	86.4

Interval #0 Information Seeding

Start Time	7:00
End Time	7:15
Total Time (min)	15

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:15
End Time	7:30
Total Time (min)	15

Run Number	1	2	3	4	5	6	7
Vehs Entered	447	440	432	446	428	429	484
Vehs Exited	443	438	416	434	411	392	454
Starting Vehs	73	85	71	83	80	70	66
Ending Vehs	77	87	87	95	97	107	96
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	2	0	1	0	0	0
Travel Distance (mi)	709	688	675	700	660	648	745
Travel Time (hr)	21.9	21.2	20.8	21.4	20.3	19.8	23.1
Total Delay (hr)	2.5	2.3	2.2	2.5	2.0	2.2	2.6
Total Stops	168	158	175	169	145	170	221
Fuel Used (gal)	22.6	21.9	21.4	22.4	20.9	20.4	23.4

Interval #1 Information Recording

Start Time	7:15
End Time	7:30
Total Time (min)	15

Run Number	8	9	10	Avg
Vehs Entered	463	433	443	446
Vehs Exited	420	429	425	428
Starting Vehs	72	78	76	73
Ending Vehs	115	82	94	91
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	0	0
Travel Distance (mi)	709	707	698	694
Travel Time (hr)	21.9	21.5	21.7	21.4
Total Delay (hr)	2.4	2.3	2.9	2.4
Total Stops	164	137	225	174
Fuel Used (gal)	22.4	22.2	22.0	22.0

Interval #2 Information Recording

Start Time	7:30
End Time	7:45
Total Time (min)	15

Run Number	1	2	3	4	5	6	7
Vehs Entered	442	447	435	452	473	438	457
Vehs Exited	436	460	437	453	482	469	467
Starting Vehs	77	87	87	95	97	107	96
Ending Vehs	83	74	85	94	88	76	86
Denied Entry Before	0	2	0	1	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Travel Distance (mi)	688	706	679	736	763	717	721
Travel Time (hr)	20.8	21.6	20.8	22.7	23.7	22.0	22.1
Total Delay (hr)	2.1	2.4	2.2	2.7	2.8	2.4	2.4
Total Stops	125	183	126	171	195	173	141
Fuel Used (gal)	21.8	22.8	21.6	23.0	24.2	22.9	22.9

Interval #2 Information Recording

Start Time	7:30
End Time	7:45
Total Time (min)	15

Run Number	8	9	10	Avg
Vehs Entered	455	427	440	446
Vehs Exited	484	439	443	454
Starting Vehs	115	82	94	91
Ending Vehs	86	70	91	83
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	1	0
Travel Distance (mi)	732	675	679	709
Travel Time (hr)	22.5	20.5	20.9	21.8
Total Delay (hr)	2.6	2.1	2.4	2.4
Total Stops	174	144	153	158
Fuel Used (gal)	23.4	21.6	21.4	22.5

Interval #3 Information Recording

Start Time	7:45
End Time	8:00
Total Time (min)	15

Run Number	1	2	3	4	5	6	7
Vehs Entered	426	421	405	436	390	453	437
Vehs Exited	435	400	425	448	420	443	430
Starting Vehs	83	74	85	94	88	76	86
Ending Vehs	74	95	65	82	58	86	93
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Travel Distance (mi)	685	658	665	690	639	716	671
Travel Time (hr)	21.0	20.0	20.0	21.2	19.3	22.2	20.8
Total Delay (hr)	2.3	2.2	2.2	2.5	2.0	2.7	2.4
Total Stops	143	115	146	154	139	169	145
Fuel Used (gal)	21.7	21.0	21.2	22.1	20.4	22.3	21.8

Interval #3 Information Recording

Start Time	7:45
End Time	8:00
Total Time (min)	15

Run Number	8	9	10	Avg
Vehs Entered	406	418	441	422
Vehs Exited	417	407	442	425
Starting Vehs	86	70	91	83
Ending Vehs	75	81	90	77
Denied Entry Before	0	0	1	0
Denied Entry After	0	0	0	0
Travel Distance (mi)	664	653	686	673
Travel Time (hr)	20.3	19.9	21.2	20.6
Total Delay (hr)	2.3	2.2	2.6	2.3
Total Stops	155	126	141	142
Fuel Used (gal)	21.1	20.6	21.8	21.4

Interval #4 Information Recording

Start Time	8:00
End Time	8:15
Total Time (min)	15

Run Number	1	2	3	4	5	6	7
Vehs Entered	386	408	407	411	395	402	408
Vehs Exited	390	422	398	399	361	404	426
Starting Vehs	74	95	65	82	58	86	93
Ending Vehs	70	81	74	94	92	84	75
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	1
Travel Distance (mi)	630	669	645	656	626	647	679
Travel Time (hr)	19.2	20.4	19.7	20.0	18.6	19.6	20.7
Total Delay (hr)	2.0	2.1	2.2	2.1	2.0	2.0	2.4
Total Stops	123	136	131	143	103	129	142
Fuel Used (gal)	19.7	21.1	20.0	20.5	20.1	20.7	21.5

Interval #4 Information Recording

Start Time	8:00
End Time	8:15
Total Time (min)	15

Run Number	8	9	10	Avg
Vehs Entered	393	384	419	400
Vehs Exited	391	382	429	400
Starting Vehs	75	81	90	77
Ending Vehs	77	83	80	77
Denied Entry Before	0	0	0	0
Denied Entry After	0	0	1	0
Travel Distance (mi)	637	615	678	648
Travel Time (hr)	19.5	18.8	20.5	19.7
Total Delay (hr)	2.1	2.0	2.2	2.1
Total Stops	119	127	140	127
Fuel Used (gal)	20.2	19.3	21.3	20.4

402: Vermillion Rd & Eddy St Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.4	0.3	0.1	0.1	0.2
Total Delay (hr)	0.0	0.0	0.2	0.0	0.0	0.0	0.3
Total Del/Veh (s)	3.5	0.3	1.5	0.9	12.0	2.2	1.0
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	1.8	0.0	0.0	0.0	10.7	2.8	0.1
Total Stops	6	0	0	0	6	2	14
Stop/Veh	0.38	0.00	0.00	0.00	1.00	1.00	0.01
Travel Dist (mi)	0.6	18.8	171.5	0.5	1.6	0.4	193.4
Travel Time (hr)	0.0	0.6	5.2	0.0	0.1	0.0	5.9
Avg Speed (mph)	15	32	33	32	21	24	33
Fuel Used (gal)	0.0	0.5	4.7	0.0	0.0	0.0	5.3
Fuel Eff. (mpg)	40.5	35.1	36.4	37.3	35.9	38.5	36.3
HC Emissions (g)	0	10	75	0	0	0	85
CO Emissions (g)	4	176	1393	2	3	1	1580
NOx Emissions (g)	1	30	237	0	1	0	269
Vehicles Entered	16	479	441	1	6	2	945
Vehicles Exited	16	479	442	1	6	2	946
Hourly Exit Rate	16	479	442	1	6	2	946
Input Volume	15	489	444	1	7	2	958
% of Volume	107	98	100	100	86	100	99
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)							637
Occupancy (veh)	0	1	5	0	0	0	6

403: Vermillion Rd & Spring St Performance by movement

Movement	EBT	WBT	WBR	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0
Total Delay (hr)	0.1	0.0	0.0	0.0	0.1
Total Del/Veh (s)	0.5	0.3	0.0	3.6	0.4
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.0	0.0	0.0	3.4	0.0
Total Stops	0	0	0	4	4
Stop/Veh	0.00	0.00	0.00	1.00	0.00
Travel Dist (mi)	34.1	18.7	0.2	0.2	53.2
Travel Time (hr)	1.0	0.6	0.0	0.0	1.7
Avg Speed (mph)	33	32	20	13	32
Fuel Used (gal)	0.9	0.5	0.0	0.0	1.4
Fuel Eff. (mpg)	37.8	36.1	82.1	49.6	37.3
HC Emissions (g)	16	8	0	0	24
CO Emissions (g)	254	137	0	0	391
NOx Emissions (g)	51	26	0	0	76
Vehicles Entered	495	440	5	4	944
Vehicles Exited	495	439	5	4	943
Hourly Exit Rate	495	439	5	4	943
Input Volume	504	443	5	3	955
% of Volume	98	99	100	133	99
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0
Density (ft/veh)					487
Occupancy (veh)	1	1	0	0	2

404: Vermillion Rd & Ashland St Performance by movement

Movement	EBT	WBT	WBR	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0
Total Delay (hr)	0.1	0.1	0.0	0.0	0.2
Total Del/Veh (s)	0.7	0.5	0.1	3.1	0.6
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.0	0.0	0.0	3.9	0.0
Total Stops	0	0	0	11	11
Stop/Veh	0.00	0.00	0.00	1.00	0.01
Travel Dist (mi)	68.7	29.0	0.3	3.5	101.5
Travel Time (hr)	2.1	0.9	0.0	0.1	3.1
Avg Speed (mph)	33	32	23	25	32
Fuel Used (gal)	1.8	0.8	0.0	0.1	2.7
Fuel Eff. (mpg)	37.7	35.2	58.8	36.9	37.0
HC Emissions (g)	34	13	0	1	48
CO Emissions (g)	514	244	1	14	773
NOx Emissions (g)	104	41	0	2	148
Vehicles Entered	496	437	5	11	949
Vehicles Exited	495	438	5	11	949
Hourly Exit Rate	495	438	5	11	949
Input Volume	504	440	4	10	958
% of Volume	98	99	125	110	99
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0
Density (ft/veh)					869
Occupancy (veh)	2	1	0	0	3

405: Vermillion Rd & Walnut St Performance by movement

Movement	EBT	WBT	WBR	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0
Total Delay (hr)	0.0	0.1	0.0	0.0	0.2
Total Del/Veh (s)	0.3	1.1	0.5	4.2	0.7
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.0	0.0	0.0	4.1	0.0
Total Stops	0	0	0	5	5
Stop/Veh	0.00	0.00	0.00	1.00	0.01
Travel Dist (mi)	40.2	61.7	1.5	1.3	104.7
Travel Time (hr)	1.2	1.9	0.1	0.1	3.2
Avg Speed (mph)	34	32	27	24	32
Fuel Used (gal)	1.1	1.7	0.0	0.0	2.9
Fuel Eff. (mpg)	38.0	35.8	42.9	39.7	36.7
HC Emissions (g)	21	27	1	0	49
CO Emissions (g)	328	471	12	3	813
NOx Emissions (g)	65	84	2	0	152
Vehicles Entered	496	440	11	5	952
Vehicles Exited	496	441	11	5	953
Hourly Exit Rate	496	441	11	5	953
Input Volume	504	442	10	5	961
% of Volume	98	100	110	100	99
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0
Density (ft/veh)					758
Occupancy (veh)	1	2	0	0	3

406: Maple St & Vermillion Rd Performance by movement

Movement	EBT	WBT	WBR	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0
Total Delay (hr)	0.0	0.1	0.0	0.0	0.1
Total Del/Veh (s)	0.2	0.6	0.2	3.5	0.4
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.0	0.0	0.0	3.6	0.0
Total Stops	0	0	0	6	6
Stop/Veh	0.00	0.00	0.00	1.00	0.01
Travel Dist (mi)	33.1	35.6	0.1	1.3	70.1
Travel Time (hr)	1.0	1.1	0.0	0.1	2.1
Avg Speed (mph)	34	32	24	24	33
Fuel Used (gal)	0.9	1.0	0.0	0.0	1.9
Fuel Eff. (mpg)	37.4	34.9	55.4	38.3	36.1
HC Emissions (g)	22	16	0	0	39
CO Emissions (g)	383	298	0	3	684
NOx Emissions (g)	65	50	0	0	116
Vehicles Entered	496	444	1	6	947
Vehicles Exited	496	444	1	6	947
Hourly Exit Rate	496	444	1	6	947
Input Volume	504	445	1	5	955
% of Volume	98	100	100	120	99
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0
Density (ft/veh)					1124
Occupancy (veh)	1	1	0	0	2

407: Vermillion Rd & Oak St Performance by movement

Movement	EBT	WBT	WBR	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0
Total Delay (hr)	0.1	0.1	0.0	0.0	0.2
Total Del/Veh (s)	0.4	0.8	0.1	4.6	0.6
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.1	0.0	0.0	4.5	0.1
Total Stops	0	0	0	5	5
Stop/Veh	0.00	0.00	0.00	1.00	0.01
Travel Dist (mi)	37.5	29.5	0.4	0.9	68.3
Travel Time (hr)	1.6	1.0	0.0	0.0	2.6
Avg Speed (mph)	23	31	23	22	26
Fuel Used (gal)	2.6	0.7	0.0	0.0	3.3
Fuel Eff. (mpg)	14.3	42.8	63.5	39.0	20.4
HC Emissions (g)	68	11	0	0	79
CO Emissions (g)	2561	191	2	2	2756
NOx Emissions (g)	195	32	0	0	227
Vehicles Entered	514	446	6	5	971
Vehicles Exited	512	445	6	5	968
Hourly Exit Rate	512	445	6	5	968
Input Volume	519	448	5	5	977
% of Volume	99	99	120	100	99
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0
Density (ft/veh)					663
Occupancy (veh)	2	1	0	0	3

408: Pine St & Vermillion Rd Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.2	0.2	0.0
Total Delay (hr)	0.1	1.0	0.6	0.0	0.1	0.1	2.0
Total Del/Veh (s)	5.1	8.1	5.5	4.1	4.4	4.2	6.3
Stop Delay (hr)	0.0	0.0	0.1	0.0	0.0	0.0	0.2
Stop Del/Veh (s)	0.3	0.2	0.5	0.6	1.5	1.2	0.5
Total Stops	4	23	42	3	19	25	116
Stop/Veh	0.06	0.05	0.10	0.11	0.31	0.24	0.10
Travel Dist (mi)	16.9	113.9	25.7	1.7	14.0	24.1	196.4
Travel Time (hr)	0.5	3.6	1.4	0.1	0.6	1.0	7.2
Avg Speed (mph)	31	31	19	18	25	25	27
Fuel Used (gal)	0.4	2.8	0.7	0.0	0.4	0.7	5.0
Fuel Eff. (mpg)	41.6	41.2	36.2	35.4	35.3	34.3	39.0
HC Emissions (g)	9	71	10	1	6	11	107
CO Emissions (g)	220	1696	227	18	130	222	2514
NOx Emissions (g)	28	220	32	3	18	31	331
Vehicles Entered	66	455	420	27	60	103	1131
Vehicles Exited	68	454	421	27	60	104	1134
Hourly Exit Rate	68	454	421	27	60	104	1134
Input Volume	65	454	425	27	65	106	1142
% of Volume	105	100	99	100	92	98	99
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)							454
Occupancy (veh)	1	4	1	0	1	1	7

409: 31st St & Vermillion Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.5	0.0	0.2	0.1	0.0	0.2	0.1	0.0
Total Delay (hr)	0.0	0.1	0.0	0.1	0.2	0.4	0.1	0.8
Total Del/Veh (s)	3.3	0.9	0.4	4.2	1.3	18.9	5.5	2.3
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.4
Stop Del/Veh (s)	1.4	0.0	0.0	2.4	0.1	16.6	4.7	1.2
Total Stops	0	0	0	32	3	65	40	140
Stop/Veh	0.00	0.00	0.00	0.52	0.01	0.97	0.98	0.11
Travel Dist (mi)	0.1	49.9	9.8	15.7	121.3	29.8	18.5	245.2
Travel Time (hr)	0.0	1.3	0.4	0.6	3.5	1.4	0.7	7.8
Avg Speed (mph)	24	39	28	28	35	22	26	31
Fuel Used (gal)	0.0	1.7	0.2	0.7	5.7	0.9	0.5	9.6
Fuel Eff. (mpg)	38.1	29.9	49.5	22.7	21.4	33.9	35.3	25.4
HC Emissions (g)	0	43	4	14	135	16	12	223
CO Emissions (g)	1	1281	97	617	5168	268	205	7637
NOx Emissions (g)	0	141	11	43	417	41	32	686
Vehicles Entered	1	489	95	60	474	65	40	1224
Vehicles Exited	1	489	96	61	474	65	40	1226
Hourly Exit Rate	1	489	96	61	474	65	40	1226
Input Volume	1	482	92	58	485	69	42	1229
% of Volume	100	101	104	105	98	94	95	100
Denied Entry Before	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0
Density (ft/veh)								1210
Occupancy (veh)	0	1	0	1	4	1	1	8

410: Riverwood Dr & Vermillion Rd Performance by movement

Movement	EBT	EBR	WBT	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0
Total Delay (hr)	0.1	0.0	0.1	0.0	0.3
Total Del/Veh (s)	0.9	0.4	0.6	3.7	0.8
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.0
Stop Del/Veh (s)	0.0	0.0	0.1	4.0	0.1
Total Stops	0	0	0	24	24
Stop/Veh	0.00	0.00	0.00	0.96	0.02
Travel Dist (mi)	84.5	3.7	57.2	6.8	152.2
Travel Time (hr)	2.1	0.1	1.5	0.3	3.9
Avg Speed (mph)	41	34	39	25	39
Fuel Used (gal)	2.3	0.1	2.0	0.2	4.6
Fuel Eff. (mpg)	36.7	44.7	28.5	37.3	33.3
HC Emissions (g)	59	2	48	3	112
CO Emissions (g)	1323	49	1485	48	2905
NOx Emissions (g)	207	6	163	9	385
Vehicles Entered	540	24	552	25	1141
Vehicles Exited	540	24	552	24	1140
Hourly Exit Rate	540	24	552	24	1140
Input Volume	532	23	562	23	1140
% of Volume	101	104	98	104	100
Denied Entry Before	0	0	0	0	0
Denied Entry After	0	0	0	0	0
Density (ft/veh)					918
Occupancy (veh)	2	0	1	0	4

411: Village Tr & Vermillion Rd Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Denied Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Denied Del/Veh (s)	0.0	0.0	0.1	0.0	0.2	0.2	0.0
Total Delay (hr)	0.3	0.0	0.0	0.1	0.3	0.0	0.9
Total Del/Veh (s)	1.9	1.5	3.4	1.0	17.4	8.3	2.5
Stop Delay (hr)	0.0	0.0	0.0	0.0	0.3	0.0	0.4
Stop Del/Veh (s)	0.1	0.1	2.0	0.0	15.3	8.2	1.1
Total Stops	1	0	24	0	65	21	111
Stop/Veh	0.00	0.00	0.48	0.00	0.98	1.00	0.09
Travel Dist (mi)	241.8	34.9	7.7	76.2	22.2	7.1	389.9
Travel Time (hr)	6.5	1.0	0.3	1.8	1.1	0.3	11.1
Avg Speed (mph)	37	35	29	41	20	23	35
Fuel Used (gal)	9.2	1.3	0.2	2.0	0.7	0.2	13.6
Fuel Eff. (mpg)	26.2	27.2	46.8	37.6	33.2	35.3	28.7
HC Emissions (g)	243	36	3	44	11	4	341
CO Emissions (g)	7854	1152	69	1008	202	74	10359
NOx Emissions (g)	772	108	11	162	29	11	1092
Vehicles Entered	548	79	50	495	65	21	1258
Vehicles Exited	549	78	50	496	65	21	1259
Hourly Exit Rate	549	78	50	496	65	21	1259
Input Volume	541	80	53	502	65	19	1260
% of Volume	101	98	94	99	100	111	100
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)							720
Occupancy (veh)	7	1	0	2	1	0	11

412: Vermillion Rd & Pleasant Dr Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Delay (hr)	0.0	0.1	0.0	0.0	0.0	0.0	0.1
Denied Del/Veh (s)	0.4	0.5	0.0	0.0	0.2	0.2	0.2
Total Delay (hr)	0.1	1.7	1.2	0.2	0.1	0.1	3.4
Total Del/Veh (s)	7.3	11.5	9.5	6.9	5.1	4.2	9.4
Stop Delay (hr)	0.0	0.1	0.1	0.0	0.0	0.0	0.3
Stop Del/Veh (s)	0.7	0.6	0.6	0.6	1.6	0.9	0.7
Total Stops	9	55	44	12	31	12	163
Stop/Veh	0.13	0.10	0.10	0.10	0.32	0.21	0.12
Travel Dist (mi)	24.6	197.5	185.7	51.5	40.1	23.8	523.2
Travel Time (hr)	0.7	5.4	5.4	1.5	1.5	0.9	15.4
Avg Speed (mph)	37	37	34	34	26	27	34
Fuel Used (gal)	0.6	4.7	4.5	1.3	1.1	0.7	12.8
Fuel Eff. (mpg)	42.3	42.2	41.3	41.1	35.9	35.7	40.9
HC Emissions (g)	14	122	90	30	19	14	290
CO Emissions (g)	422	3516	2064	654	333	250	7238
NOx Emissions (g)	45	369	319	102	53	40	928
Vehicles Entered	66	529	440	120	95	57	1307
Vehicles Exited	66	528	440	120	96	57	1307
Hourly Exit Rate	66	528	440	120	96	57	1307
Input Volume	65	522	440	127	94	51	1299
% of Volume	102	101	100	94	102	112	101
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0
Density (ft/veh)							422
Occupancy (veh)	1	5	5	2	2	1	15

Total Network Performance

Denied Delay (hr)	0.2
Denied Del/Veh (s)	0.4
Total Delay (hr)	9.1
Total Del/Veh (s)	18.3
Stop Delay (hr)	1.4
Stop Del/Veh (s)	2.7
Total Stops	602
Stop/Veh	0.34
Travel Dist (mi)	2724.2
Travel Time (hr)	83.4
Avg Speed (mph)	33
Fuel Used (gal)	86.4
Fuel Eff. (mpg)	31.5
HC Emissions (g)	1888
CO Emissions (g)	52915
NOx Emissions (g)	5883
Vehicles Entered	1712
Vehicles Exited	1710
Hourly Exit Rate	1710
Input Volume	13438
% of Volume	13
Denied Entry Before	0
Denied Entry After	0
Density (ft/veh)	536
Occupancy (veh)	83

Intersection: 402: Vermillion Rd & Eddy St

Movement	EB	EB	SB
Directions Served	L	T	LR
Maximum Queue (ft)	35	4	16
Average Queue (ft)	6	0	3
95th Queue (ft)	27	0	12
Link Distance (ft)		151	1332
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	125		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 403: Vermillion Rd & Spring St

Movement	SB
Directions Served	R
Maximum Queue (ft)	30
Average Queue (ft)	4
95th Queue (ft)	21
Link Distance (ft)	216
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 404: Vermillion Rd & Ashland St

Movement	SB
Directions Served	R
Maximum Queue (ft)	16
Average Queue (ft)	4
95th Queue (ft)	12
Link Distance (ft)	1652
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 405: Vermillion Rd & Walnut St

Movement	SB
Directions Served	R
Maximum Queue (ft)	31
Average Queue (ft)	5
95th Queue (ft)	22
Link Distance (ft)	1293
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 406: Maple St & Vermillion Rd

Movement	SB
Directions Served	R
Maximum Queue (ft)	27
Average Queue (ft)	4
95th Queue (ft)	20
Link Distance (ft)	1233
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 407: Vermillion Rd & Oak St

Movement	SB
Directions Served	R
Maximum Queue (ft)	30
Average Queue (ft)	4
95th Queue (ft)	21
Link Distance (ft)	998
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 408: Pine St & Vermillion Rd

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	87	117	94
Average Queue (ft)	19	29	30
95th Queue (ft)	62	84	72
Link Distance (ft)	1280	269	1227
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 409: 31st St & Vermillion Rd

Movement	EB	EB	EB	WB	NB	NB
Directions Served	L	T	R	L	L	TR
Maximum Queue (ft)	5	5	12	52	96	56
Average Queue (ft)	0	0	0	18	35	18
95th Queue (ft)	5	0	8	45	72	43
Link Distance (ft)		504			2421	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	175		175	250		100
Storage Blk Time (%)					0	0
Queuing Penalty (veh)					0	0

Intersection: 410: Riverwood Dr & Vermillion Rd

Movement	NB
Directions Served	R
Maximum Queue (ft)	41
Average Queue (ft)	11
95th Queue (ft)	31
Link Distance (ft)	1441
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 411: Village Tr & Vermillion Rd

Movement	EB	WB	NB
Directions Served	R	L	LR
Maximum Queue (ft)	2	53	94
Average Queue (ft)	0	16	35
95th Queue (ft)	0	43	72
Link Distance (ft)			1781
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	310	150	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 412: Vermillion Rd & Pleasant Dr

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	122	122	91
Average Queue (ft)	33	32	29
95th Queue (ft)	87	90	69
Link Distance (ft)	1972	2213	2212
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 0

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route	CSAH 46	**District**	n/a	**County**	Dakota County
Begin RP	n/a	**End RP**	n/a	**Miles**	
Location	CSAH 46 between Pleasant Drive and Highway 61				

B. Project Description

Proposed Work	Convert Pleasant Drive to a Single-Lane Roundabout		
Project Cost*		**Installation Year**	2024
Project Service Life	20 years	**Traffic Growth Factor**	1.7%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

0.42	**Fatal (K) Crashes**	**Reference**	CMF 207: Conversion of Stop-Controlled to RAB
0.42	**Serious Injury (A) Crashes**		
0.42	**Moderate Injury (B) Crashes**	**Crash Type**	Angle
0.42	**Possible Injury (C) Crashes**		
0.42	**Property Damage Only Crashes**		www.CMFclearinghouse.org

D. Crash Modification Factor (optional second CMF)

0.56	**Fatal (K) Crashes**	**Reference**	CMF 253: Provide a Left-Turn Lane on Major Approach
0.56	**Serious Injury (A) Crashes**		
0.56	**Moderate Injury (B) Crashes**	**Crash Type**	Rear End (Bypass Lane)
0.56	**Possible Injury (C) Crashes**		
0.56	**Property Damage Only Crashes**		www.CMFclearinghouse.org

E. Crash Data

Begin Date	1/1/2019	**End Date**	12/31/2021	3 years
Data Source	Minnesota Crash Mapping Analysis Tool (MnCMAT2)			

Crash Severity	Angle	Rear End (Bypass Lane)
K crashes	0	0
A crashes	0	0
B crashes	1	0
C crashes	0	0
PDO crashes	0	2

F. Benefit-Cost Calculation

$1,062,359	**Benefit (present value)**
$0	**Cost**

B/C Ratio = N/A

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	$1,500,000
A crashes	$750,000
B crashes	$230,000
C crashes	$120,000
PDO crashes	$13,000

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

Real Discount Rate 0.7%

Traffic Growth Rate 1.7%

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	0.58	0.19	$44,467
C crashes	0.00	0.00	$0
PDO crashes	0.88	0.29	$3,813
			$48,280

H. Amortized Benefit

Year	Crash Benefits	Present Value
2024	$48,280	$48,280
2025	$49,101	$48,759
2026	$49,935	$49,244
2027	$50,784	$49,733
2028	$51,648	$50,227
2029	$52,526	$50,725
2030	$53,419	$51,229
2031	$54,327	$51,738
2032	$55,250	$52,252
2033	$56,190	$52,770
2034	$57,145	$53,294
2035	$58,116	$53,824
2036	$59,104	$54,358
2037	$60,109	$54,898
2038	$61,131	$55,443
2039	$62,170	$55,994
2040	$63,227	$56,550
2041	$64,302	$57,111
2042	$65,395	$57,678
2043	$66,507	$58,251
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0

Total = $1,062,359

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route	CSAH 46	**District**	n/a	**County**	Dakota County
Begin RP	n/a	**End RP**	n/a	**Miles**	1.3
Location	CSAH 46 between Pleasant Drive and Highway 61				

B. Project Description

Proposed Work	Provide Dedicated Left- and Right-Turn Lanes on CSAH 46		
Project Cost*		**Installation Year**	2024
Project Service Life	20 years	**Traffic Growth Factor**	1.7%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

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

D. Crash Modification Factor (optional second CMF)

0.56	**Fatal (K) Crashes**	**Reference**	CMF 253: Provide a Left-Turn Lane on Major Approach
0.56	**Serious Injury (A) Crashes**		
0.56	**Moderate Injury (B) Crashes**	**Crash Type**	Rear End (Bypass Lane)
0.56	**Possible Injury (C) Crashes**		
0.56	**Property Damage Only Crashes**		www.CMFclearinghouse.org

E. Crash Data

Begin Date	1/1/2019	**End Date**	12/31/2021	3 years
Data Source	Minnesota Crash Mapping Analysis Tool (MnCMAT2)			

Crash Severity	Angle	Rear End (Bypass Lane)
K crashes	0	0
A crashes	0	0
B crashes	0	0
C crashes	0	0
PDO crashes	1	1

F. Benefit-Cost Calculation

$41,955	**Benefit (present value)**
$0	**Cost**

B/C Ratio = N/A

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	$1,500,000
A crashes	$750,000
B crashes	$230,000
C crashes	$120,000
PDO crashes	$13,000

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

Real Discount Rate 0.7%

Traffic Growth Rate 1.7%

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	0.44	0.15	$1,907
			$1,907

H. Amortized Benefit

Year	Crash Benefits	Present Value
2024	$1,907	$1,907
2025	$1,939	$1,926
2026	$1,972	$1,945
2027	$2,006	$1,964
2028	$2,040	$1,984
2029	$2,074	$2,003
2030	$2,110	$2,023
2031	$2,145	$2,043
2032	$2,182	$2,064
2033	$2,219	$2,084
2034	$2,257	$2,105
2035	$2,295	$2,126
2036	$2,334	$2,147
2037	$2,374	$2,168
2038	$2,414	$2,190
2039	$2,455	$2,211
2040	$2,497	$2,233
2041	$2,539	$2,255
2042	$2,583	$2,278
2043	$2,626	$2,300
0	$0	$0
0	$0	$0
0	$0	$0
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 = $41,955

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route	CSAH 46	**District**	n/a	**County**	Dakota County
Begin RP	n/a	**End RP**	n/a	**Miles**	1.3
Location	CSAH 46 between Pleasant Drive and Highway 61				

B. Project Description

Proposed Work	Convert Riverwood Drive to Right-In, Right-Out (Raised Median on CSAH 46)		
Project Cost*		**Installation Year**	2024
Project Service Life	20 years	**Traffic Growth Factor**	1.7%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

0.00	**Fatal (K) Crashes**	**Reference**	Engineering Judgement
0.00	**Serious Injury (A) Crashes**		
0.00	**Moderate Injury (B) Crashes**	**Crash Type**	Rear End (Bypass Lane)
0.00	**Possible Injury (C) Crashes**		
0.00	**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	1/1/2019	**End Date**	12/31/2021	3 years
Data Source	Minnesota Crash Mapping Analysis Tool (MnCMAT2)			

Crash Severity	Rear End (Bypass Lane)	< optional 2nd CMF >
K crashes	0	0
A crashes	1	0
B crashes	0	0
C crashes	0	0
PDO crashes	0	0

F. Benefit-Cost Calculation

$5,501,029	**Benefit (present value)**	**B/C Ratio = N/A**
$0	**Cost**	

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

F. Analysis Assumptions

Crash Severity	Crash Cost
K crashes	$1,500,000
A crashes	$750,000
B crashes	$230,000
C crashes	$120,000
PDO crashes	$13,000

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

Real Discount Rate	0.7%
Traffic Growth Rate	1.7%
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	1.00	0.33	$250,000
B crashes	0.00	0.00	$0
C crashes	0.00	0.00	$0
PDO crashes	0.00	0.00	$0
			$250,000

H. Amortized Benefit

Year	Crash Benefits	Present Value
2024	$250,000	$250,000
2025	$254,250	$252,483
2026	$258,572	$254,990
2027	$262,968	$257,522
2028	$267,438	$260,079
2029	$271,985	$262,662
2030	$276,609	$265,270
2031	$281,311	$267,905
2032	$286,093	$270,565
2033	$290,957	$273,252
2034	$295,903	$275,966
2035	$300,933	$278,706
2036	$306,049	$281,474
2037	$311,252	$284,269
2038	$316,543	$287,092
2039	$321,925	$289,943
2040	$327,397	$292,822
2041	$332,963	$295,730
2042	$338,624	$298,667
2043	$344,380	$301,633
0	$0	$0
0	$0	$0
0	$0	$0
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 = $5,501,029

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route	CSAH 46	**District**	n/a	**County**	Dakota County
Begin RP	n/a	**End RP**	n/a	**Miles**	1.3
Location	CSAH 46 between Pleasant Drive and Highway 61				

B. Project Description

Proposed Work	Convert Pine Street to a Single-Lane Roundabout		
Project Cost*		**Installation Year**	2024
Project Service Life	20 years	**Traffic Growth Factor**	1.7%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

0.56	**Fatal (K) Crashes**	**Reference**	CMF 253: Provide a Left-Turn Lane on Major Approach
0.56	**Serious Injury (A) Crashes**		
0.56	**Moderate Injury (B) Crashes**	**Crash Type**	Rear End (Bypass Lane)
0.56	**Possible Injury (C) Crashes**		
0.56	**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 1/1/2019 **End Date** 12/31/2021 3 years

Data Source Minnesota Crash Mapping Analysis Tool (MnCMAT2)

Crash Severity	Rear End (Bypass Lane)	< optional 2nd CMF >
K crashes	0	0
A crashes	0	0
B crashes	0	0
C crashes	0	0
PDO crashes	2	0

F. Benefit-Cost Calculation

$83,910	**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	$1,500,000
A crashes	$750,000
B crashes	$230,000
C crashes	$120,000
PDO crashes	$13,000

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

Real Discount Rate 0.7%

Traffic Growth Rate 1.7%

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	0.88	0.29	$3,813
			$3,813

H. Amortized Benefit

Year	Crash Benefits	Present Value
2024	$3,813	$3,813
2025	$3,878	$3,851
2026	$3,944	$3,889
2027	$4,011	$3,928
2028	$4,079	$3,967
2029	$4,149	$4,006
2030	$4,219	$4,046
2031	$4,291	$4,086
2032	$4,364	$4,127
2033	$4,438	$4,168
2034	$4,514	$4,209
2035	$4,590	$4,251
2036	$4,668	$4,293
2037	$4,748	$4,336
2038	$4,828	$4,379
2039	$4,910	$4,423
2040	$4,994	$4,467
2041	$5,079	$4,511
2042	$5,165	$4,556
2043	$5,253	$4,601
0	$0	$0
0	$0	$0
0	$0	$0
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 = $83,910

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route	CSAH 46	**District**	n/a	**County**	Dakota County
Begin RP	n/a	**End RP**	n/a	**Miles**	1.3
Location	CSAH 46 between Pleasant Drive and Highway 61				

B. Project Description

Proposed Work	Convert Oak Street to Right-In, Right-Out (Raised Median on CSAH 46)		
Project Cost*		**Installation Year**	2024
Project Service Life	20 years	**Traffic Growth Factor**	1.7%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

0.56	**Fatal (K) Crashes**	**Reference**	CMF 253: Provide a Left-Turn Lane on Major Approach
0.56	**Serious Injury (A) Crashes**		
0.56	**Moderate Injury (B) Crashes**	**Crash Type**	Rear End (No Left-Turn Lane)
0.56	**Possible Injury (C) Crashes**		
0.56	**Property Damage Only Crashes**		www.CMFclearinghouse.org

D. Crash Modification Factor (optional second CMF)

0.00	**Fatal (K) Crashes**	**Reference**	Engineering Judgement
0.00	**Serious Injury (A) Crashes**		
0.00	**Moderate Injury (B) Crashes**	**Crash Type**	Head On (U-Turn)
0.00	**Possible Injury (C) Crashes**		
0.00	**Property Damage Only Crashes**		www.CMFclearinghouse.org

E. Crash Data

Begin Date	1/1/2019	**End Date**	12/31/2021	3 years
Data Source	Minnesota Crash Mapping Analysis Tool (MnCMAT2)			

Crash Severity	Rear End (No Left-Turn Lane)	Head On (U-Turn)
K crashes	0	1
A crashes	0	0
B crashes	1	0
C crashes	0	0
PDO crashes	1	0

F. Benefit-Cost Calculation

$11,786,283	**Benefit (present value)**	**B/C Ratio = N/A**
$0	**Cost**	

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

F. Analysis Assumptions

Crash Severity	Crash Cost
K crashes	$1,500,000
A crashes	$750,000
B crashes	$230,000
C crashes	$120,000
PDO crashes	$13,000

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

Real Discount Rate 0.7%

Traffic Growth Rate 1.7%

Project Service Life 20 years

G. Annual Benefit

Crash Severity	Crash Reduction	Annual Reduction	Annual Benefit
K crashes	1.00	0.33	$500,000
A crashes	0.00	0.00	$0
B crashes	0.44	0.15	$33,733
C crashes	0.00	0.00	$0
PDO crashes	0.44	0.15	$1,907
			$535,640

H. Amortized Benefit

Year	Crash Benefits	Present Value
2024	$535,640	$535,640
2025	$544,746	$540,959
2026	$554,007	$546,331
2027	$563,425	$551,756
2028	$573,003	$557,236
2029	$582,744	$562,769
2030	$592,651	$568,358
2031	$602,726	$574,002
2032	$612,972	$579,702
2033	$623,393	$585,459
2034	$633,990	$591,273
2035	$644,768	$597,144
2036	$655,729	$603,074
2037	$666,876	$609,063
2038	$678,213	$615,111
2039	$689,743	$621,220
2040	$701,469	$627,389
2041	$713,394	$633,619
2042	$725,521	$639,911
2043	$737,855	$646,266
0	$0	$0
0	$0	$0
0	$0	$0
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 = $11,786,283

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route	CSAH 46	**District**	n/a	**County**	Dakota County
Begin RP	n/a	**End RP**	n/a	**Miles**	1.3
Location	CSAH 46 between Pleasant Drive and Highway 61				

B. Project Description

Proposed Work	Convert Walnut Street to Right-In, Right-Out (Raised Median on CSAH 46)		
Project Cost*		**Installation Year**	2024
Project Service Life	20 years	**Traffic Growth Factor**	1.7%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

1.00	**Fatal (K) Crashes**	**Reference**	Engineering Judgement
1.00	**Serious Injury (A) Crashes**		
1.00	**Moderate Injury (B) Crashes**	**Crash Type**	Rear End (Southbound, Side-Street)
1.00	**Possible Injury (C) Crashes**		
1.00	**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	1/1/2019	**End Date**	12/31/2021	3 years
Data Source	Minnesota Crash Mapping Analysis Tool (MnCMAT2)			

Crash Severity	Rear End (Southbound, Side-Street)	< optional 2nd CMF >
K crashes	0	0
A crashes	0	0
B crashes	0	0
C crashes	1	0
PDO crashes	0	0

F. Benefit-Cost Calculation

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

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

F. Analysis Assumptions

Crash Severity	Crash Cost
K crashes	$1,500,000
A crashes	$750,000
B crashes	$230,000
C crashes	$120,000
PDO crashes	$13,000

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

Real Discount Rate 0.7%

Traffic Growth Rate 1.7%

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	0.00	0.00	$0
			$0

H. Amortized Benefit

Total = $0

Year	Crash Benefits	Present Value
2024	$0	$0
2025	$0	$0
2026	$0	$0
2027	$0	$0
2028	$0	$0
2029	$0	$0
2030	$0	$0
2031	$0	$0
2032	$0	$0
2033	$0	$0
2034	$0	$0
2035	$0	$0
2036	$0	$0
2037	$0	$0
2038	$0	$0
2039	$0	$0
2040	$0	$0
2041	$0	$0
2042	$0	$0
2043	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route	CSAH 46	**District**	n/a	**County**	Dakota County
Begin RP	n/a	**End RP**	n/a	**Miles**	1.3
Location	CSAH 46 between Pleasant Drive and Highway 61				

B. Project Description

Proposed Work	Provide Dedicated Left- and Right-Turn Lanes on CSAH 46		
Project Cost*		**Installation Year**	2024
Project Service Life	20 years	**Traffic Growth Factor**	1.7%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

0.56	**Fatal (K) Crashes**	**Reference**	CMF 253: Provide a Left-Turn Lane on Major Approach
0.56	**Serious Injury (A) Crashes**		
0.56	**Moderate Injury (B) Crashes**	**Crash Type**	Rear End (No Left-Turn Lane)
0.56	**Possible Injury (C) Crashes**		
0.56	**Property Damage Only Crashes**		www.CMFclearinghouse.org

D. Crash Modification Factor (optional second CMF)

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

E. Crash Data

Begin Date 1/1/2019 **End Date** 12/31/2021 3 years

Data Source Minnesota Crash Mapping Analysis Tool (MnCMAT2)

Crash Severity	Rear End (No Left-Turn Lane)	Angle
K crashes	0	0
A crashes	0	0
B crashes	0	0
C crashes	0	0
PDO crashes	2	1

F. Benefit-Cost Calculation

$83,910	**Benefit (present value)**
$0	**Cost**

B/C Ratio = N/A

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	$1,500,000
A crashes	$750,000
B crashes	$230,000
C crashes	$120,000
PDO crashes	$13,000

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

Real Discount Rate 0.7%

Traffic Growth Rate 1.7%

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	0.88	0.29	$3,813
			$3,813

H. Amortized Benefit

Year	Crash Benefits	Present Value
2024	$3,813	$3,813
2025	$3,878	$3,851
2026	$3,944	$3,889
2027	$4,011	$3,928
2028	$4,079	$3,967
2029	$4,149	$4,006
2030	$4,219	$4,046
2031	$4,291	$4,086
2032	$4,364	$4,127
2033	$4,438	$4,168
2034	$4,514	$4,209
2035	$4,590	$4,251
2036	$4,668	$4,293
2037	$4,748	$4,336
2038	$4,828	$4,379
2039	$4,910	$4,423
2040	$4,994	$4,467
2041	$5,079	$4,511
2042	$5,165	$4,556
2043	$5,253	$4,601
0	$0	$0
0	$0	$0
0	$0	$0
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 = $83,910

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route	CSAH 46	**District**	n/a	**County**	Dakota County
Begin RP	n/a	**End RP**	n/a	**Miles**	1.3
Location	CSAH 46 between Pleasant Drive and Highway 61				

B. Project Description

Proposed Work	Convert Rural Section to Urban Section with Raised Median		
Project Cost*		**Installation Year**	2024
Project Service Life	20 years	**Traffic Growth Factor**	1.7%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

0.89	**Fatal (K) Crashes**	**Reference**	CMF 2375: Install Curb & Gutter
0.89	**Serious Injury (A) Crashes**		
0.89	**Moderate Injury (B) Crashes**	**Crash Type**	Run Off Road
0.89	**Possible Injury (C) Crashes**		
0.89	**Property Damage Only Crashes**		www.CMFclearinghouse.org

D. Crash Modification Factor (optional second CMF)

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

E. Crash Data

Begin Date	1/1/2019	**End Date**	12/31/2021	3 years
Data Source	Minnesota Crash Mapping Analysis Tool (MnCMAT2)			

Crash Severity	Run Off Road	Animal
K crashes	0	0
A crashes	1	0
B crashes	0	0
C crashes	0	0
PDO crashes	8	3

F. Benefit-Cost Calculation

$689,023	**Benefit (present value)**
$0	**Cost**

B/C Ratio = N/A

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

F. Analysis Assumptions

Crash Severity	Crash Cost
K crashes	$1,500,000
A crashes	$750,000
B crashes	$230,000
C crashes	$120,000
PDO crashes	$13,000

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

Real Discount Rate 0.7%

Traffic Growth Rate 1.7%

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	0.11	0.04	$27,500
B crashes	0.00	0.00	$0
C crashes	0.00	0.00	$0
PDO crashes	0.88	0.29	$3,813
			$31,313

H. Amortized Benefit

Year	Crash Benefits	Present Value
2024	$31,313	$31,313
2025	$31,846	$31,624
2026	$32,387	$31,938
2027	$32,938	$32,255
2028	$33,498	$32,576
2029	$34,067	$32,899
2030	$34,646	$33,226
2031	$35,235	$33,556
2032	$35,834	$33,889
2033	$36,443	$34,226
2034	$37,063	$34,566
2035	$37,693	$34,909
2036	$38,334	$35,256
2037	$38,985	$35,606
2038	$39,648	$35,959
2039	$40,322	$36,316
2040	$41,008	$36,677
2041	$41,705	$37,041
2042	$42,414	$37,409
2043	$43,135	$37,780
0	$0	$0
0	$0	$0
0	$0	$0
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 = $689,023

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route	CSAH 46	**District**	n/a	**County**	Dakota County
Begin RP	n/a	**End RP**	n/a	**Miles**	1.3
Location	CSAH 46 between Pleasant Drive and Highway 61				

B. Project Description

Proposed Work	CSAH 46 Improvements (RABs at Pleasant & Pine, Urban Section, Raised Median)		
Project Cost*		**Installation Year**	2024
Project Service Life	20 years	**Traffic Growth Factor**	1.7%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

-	**Fatal (K) Crashes**	**Reference**	CMF XXXX & Engineering Judgement
-	**Serious Injury (A) Crashes**		
-	**Moderate Injury (B) Crashes**	**Crash Type**	Intersections
-	**Possible Injury (C) Crashes**		
-	**Property Damage Only Crashes**		www.CMFclearinghouse.org

D. Crash Modification Factor (optional second CMF)

-	**Fatal (K) Crashes**	**Reference**	CMF XXXX & Engineering Judgement
-	**Serious Injury (A) Crashes**		
-	**Moderate Injury (B) Crashes**	**Crash Type**	Segments
-	**Possible Injury (C) Crashes**		
-	**Property Damage Only Crashes**		www.CMFclearinghouse.org

E. Crash Data

Begin Date 1/1/2019 **End Date** 12/31/2021 3 years

Data Source Minnesota Crash Mapping Analysis Tool (MnCMAT2)

Crash Severity	Intersections	Segments
K crashes	1	0
A crashes	1	1
B crashes	2	0
C crashes	1	0
PDO crashes	10	11

F. Benefit-Cost Calculation

$19,248,464	**Benefit (present value)**	**B/C Ratio = N/A**
$0	**Cost**	

Proposed project expected to reduce 3 crashes annually, 1 of which involving fatality or serious injury.

F. Analysis Assumptions

Crash Severity	Crash Cost
K crashes	$1,500,000
A crashes	$750,000
B crashes	$230,000
C crashes	$120,000
PDO crashes	$13,000

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

Real Discount Rate 0.7%

Traffic Growth Rate 1.7%

Project Service Life 20 years

G. Annual Benefit

Crash Severity	Crash Reduction	Annual Reduction	Annual Benefit
K crashes	1.00	0.33	$500,000
A crashes	1.11	0.37	$277,500
B crashes	1.02	0.34	$78,200
C crashes	0.00	0.00	$0
PDO crashes	4.40	1.47	$19,067
			$874,767

H. Amortized Benefit

Year	Crash Benefits	Present Value
2024	$874,767	$874,767
2025	$889,638	$883,454
2026	$904,762	$892,227
2027	$920,142	$901,087
2028	$935,785	$910,035
2029	$951,693	$919,072
2030	$967,872	$928,199
2031	$984,326	$937,417
2032	$1,001,059	$946,726
2033	$1,018,077	$956,127
2034	$1,035,385	$965,622
2035	$1,052,986	$975,211
2036	$1,070,887	$984,895
2037	$1,089,092	$994,676
2038	$1,107,607	$1,004,553
2039	$1,126,436	$1,014,529
2040	$1,145,585	$1,024,604
2041	$1,165,060	$1,034,779
2042	$1,184,866	$1,045,054
2043	$1,205,009	$1,055,432
0	$0	$0
0	$0	$0
0	$0	$0
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 = $19,248,464

CMF / CRF Details

CMF ID: 207

Conversion of stop-controlled intersection into single-lane roundabout

Description:

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

Category: Intersection geometry

Study: ***Observational Before-After Study of the Safety Effect of U.S. Roundabout Conversions Using the Empirical Bayes Method*****, Persaud et al., 2001**

Star Quality Rating:	★★★★☆

Crash Modification Factor (CMF)	
Value:	0.42
Adjusted Standard Error:	0.13
Unadjusted Standard Error:	0.07

Crash Reduction Factor (CRF)	
Value:	58 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	13

Unadjusted Standard Error:	7

Applicability

Crash Type:	All
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:	Not specified
Traffic Control:	Stop-controlled
Major Road Traffic Volume:	
Minor Road Traffic Volume:	

Development Details

Date Range of Data Used:	
Municipality:	
State:	

Country:	
Type of Methodology Used:	2
Sample Size Used:	

Other Details

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

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: 253

Provide a left-turn lane on one major-road approach

Description:

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

Category: Intersection geometry

Study: ***Safety Effectiveness of Intersection Left- and Right-Turn Lanes*****, Harwood et al., 2002**

Star Quality Rating:	★★★★☆

Crash Modification Factor (CMF)	
Value:	0.56
Adjusted Standard Error:	0.07
Unadjusted Standard Error:	0.06

Crash Reduction Factor (CRF)	
Value:	44 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	7

Unadjusted Standard Error:	6

Applicability

Crash Type:	All
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
Traffic Control:	Stop-controlled
Major Road Traffic Volume:	1600 to 32400 Average Daily Traffic (ADT)
Minor Road Traffic Volume:	50 to 11800 Average Daily Traffic (ADT)

Development Details

Date Range of Data Used:	
Municipality:	
State:	

Country:	
Type of Methodology Used:	2
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 The number of crashes in the after period were not reported in this study, however, they have been recorded as 300 to give 10 points as a beneift of doubt for one or more of the following: (1) number of miles/sites in the reference/treatment group, (2) number of crashes in the references/treatment group, (3) reporting AADTs for the aggregate dataset but not for the disaggragate dataset used for CMF development.

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: 2375

Install curb and gutter

Description: Install AASHTO Type B curb along the outside (right) shoulder of four-lane suburban roadways.

Prior Condition: Suburban four-lane facilities without curb on the outside (right) shoulder. All roads have either two-way left-turn lanes or non-traversable medians.

Category: Shoulder treatments

Study: *Collision Models for Multilane Highway Segments to Examine the Safety of Curbs*, Baek and Hummer, 2008

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

Crash Modification Factor (CMF)	
Value:	0.89
Adjusted Standard Error:	
Unadjusted Standard Error:	

Crash Reduction Factor (CRF)	
Value:	11 *(This value indicates a **decrease** in crashes)*

Adjusted Standard Error:	
Unadjusted Standard Error:	

Applicability

Crash Type:	All
Crash Severity:	All
Roadway Types:	Not Specified
Number of Lanes:	4
Road Division Type:	Divided by Median
Speed Limit:	45-55mph
Area Type:	Suburban
Traffic Volume:	8333 to 57138
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

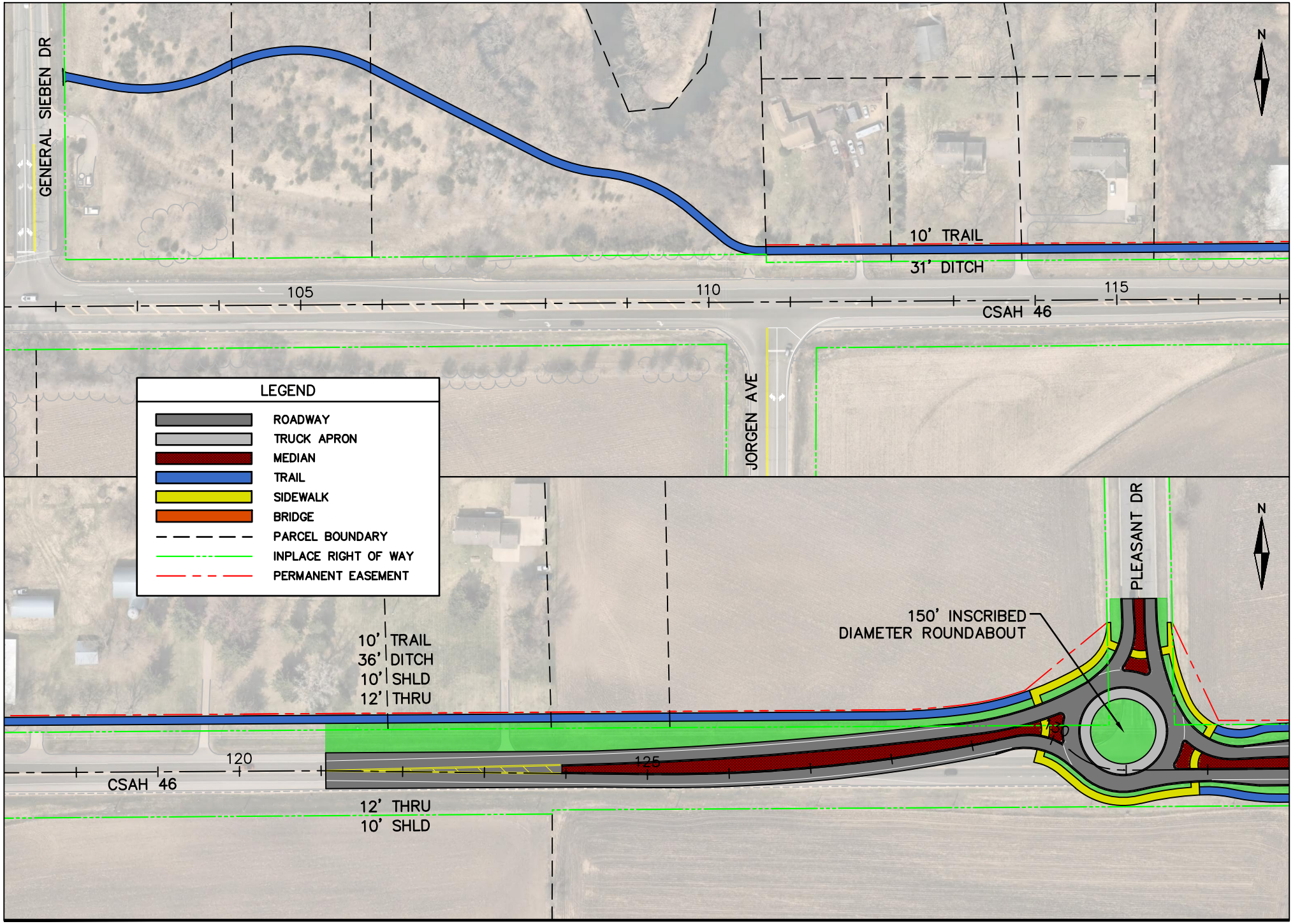
Date Range of Data Used:	2001 to 2003
Municipality:	

State:	NC
Country:	
Type of Methodology Used:	7
Sample Size Used:	2274 Crashes

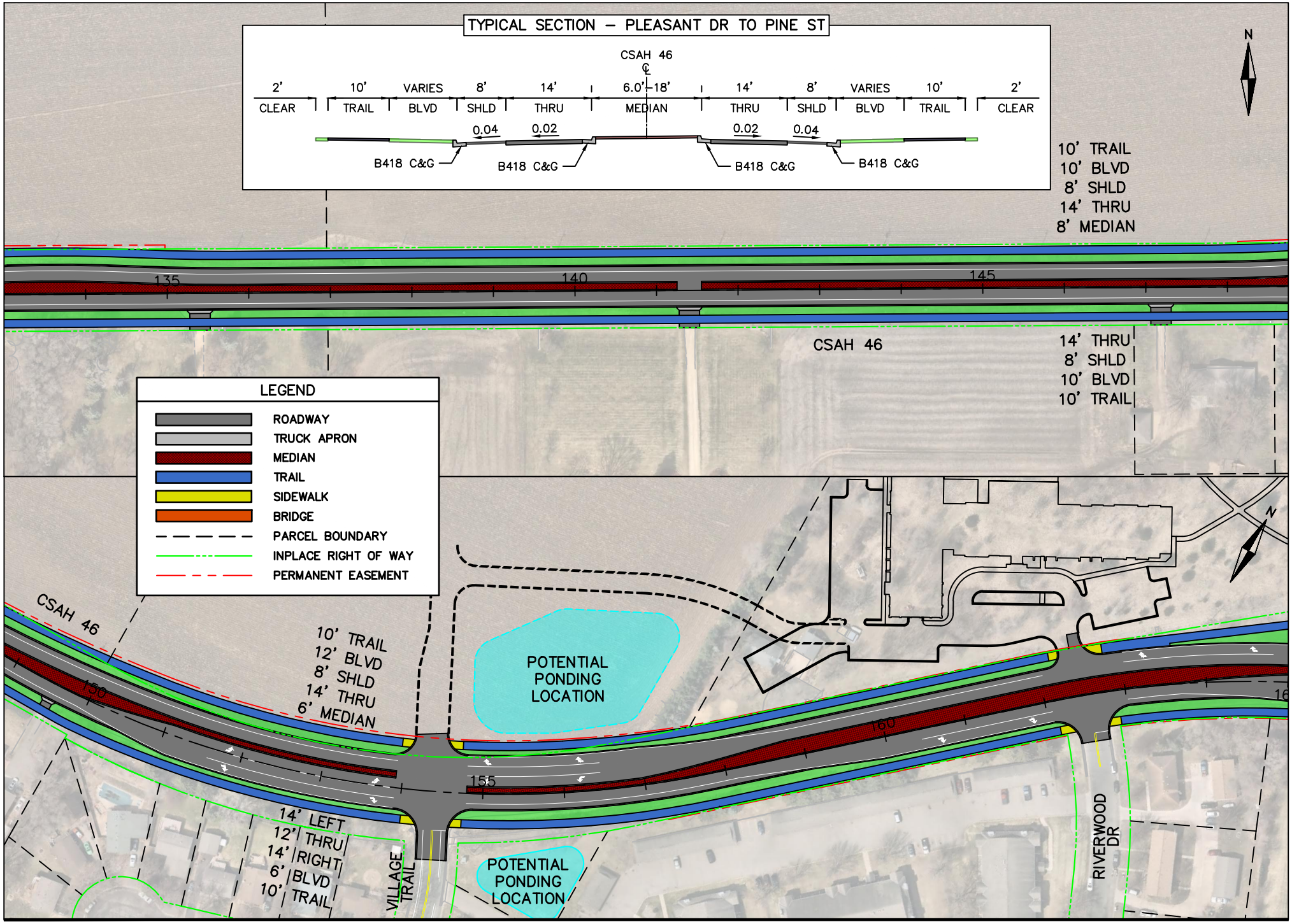
Other Details

Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	
Comments:	

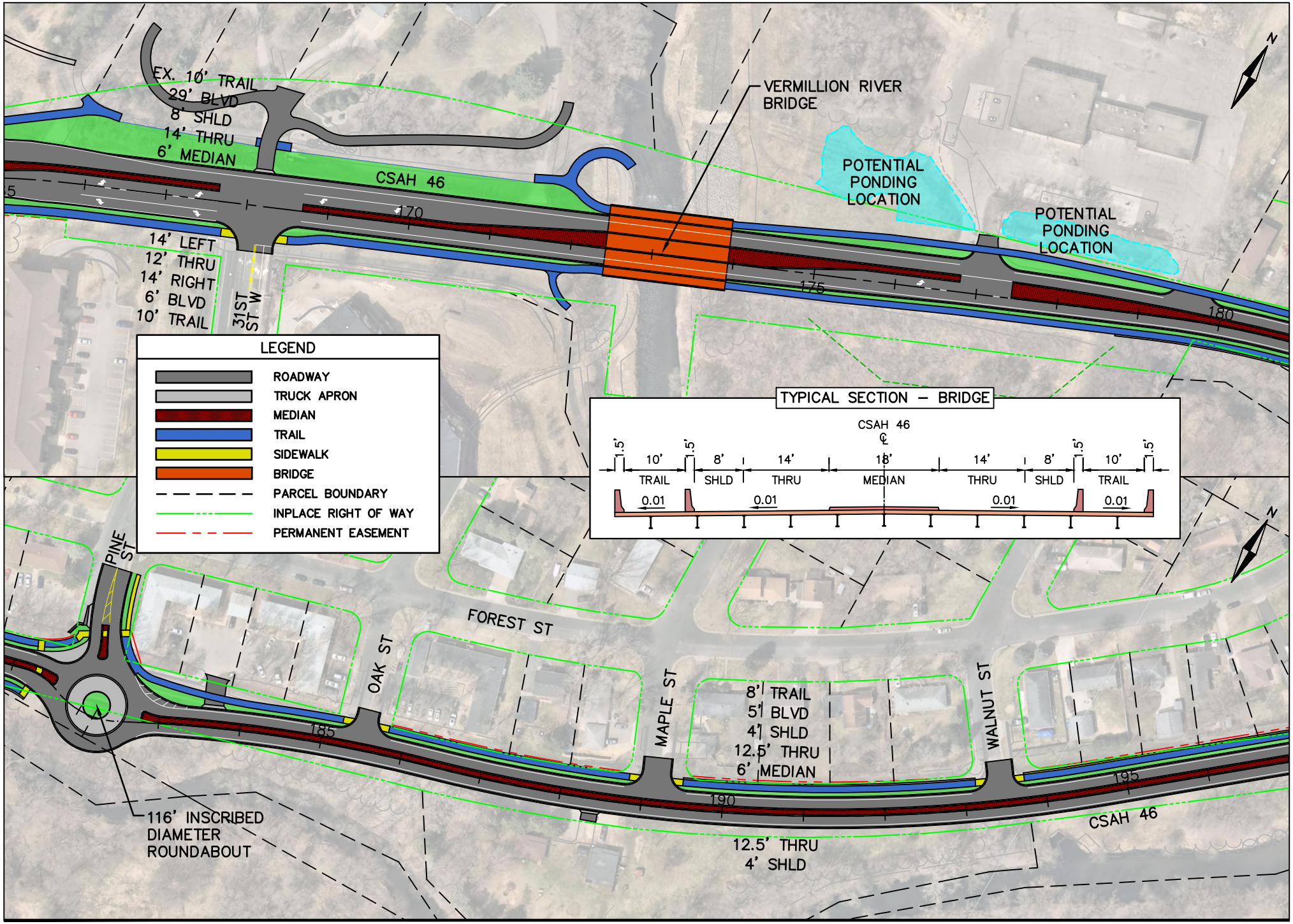
This site is funded by the U.S. Department of Transportation Federal Highway Administration and maintained by the University of North Carolina Highway Safety Research Center



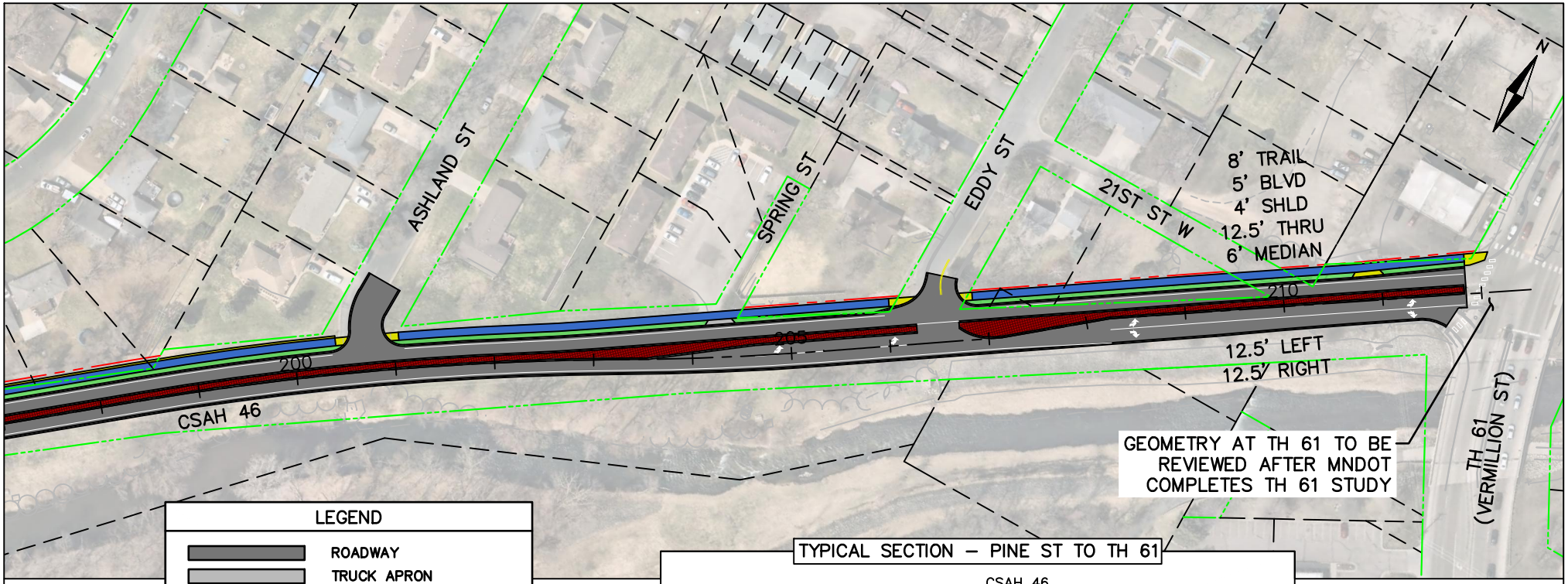
CSAH 46 - General Sieben Drive to Highway 61
Recommended Improvements



CSAH 46 - General Sieben Drive to Highway 61
Recommended Improvements



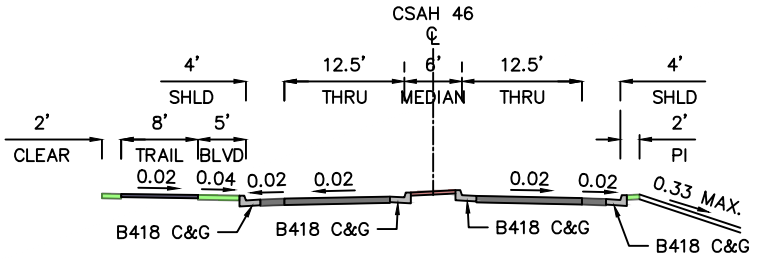
CSAH 46 - General Sieben Drive to Highway 61
Recommended Improvements



LEGEND

- ROADWAY
- TRUCK APRON
- MEDIAN
- TRAIL
- SIDEWALK
- BRIDGE
- PARCEL BOUNDARY
- INPLACE RIGHT OF WAY
- PERMANENT EASEMENT

TYPICAL SECTION – PINE ST TO TH 61



ATTACHMENT A

County State Aid Highway 46 Reconstruction

Applicant: Dakota County

Project Location: CSAH 46 between General Sieben Drive and Highway 61, Hastings, MN

Project Costs:

- Total construction cost: $10,450,000
- Requested Award Amount/Match Amount: $7,000,000 / $3,450,000 (CSAH, Local)

Project Description

Dakota County, in cooperation with the City of Hastings have completed a corridor study along County Road 46 between the Vermillion River crossing west of General Sieben Drive and Highway 61. The operations review and community engagement identified issues and needs along the corridor which the project partners used to developed potential solutions for the corridor. The alternatives and community input formed the study recommendations.

The City of Hastings Council and Dakota County Board of Commissioners adopted the results of the CSAH 46 corridor study and from the recommendations determined to advance a reconstruction project of CSAH 46 from Pleasant Drive to Highway 61 to modernize the corridor and address safety and mobility issues. The project includes reconstructing CSAH 46 as a divided 2-lane roadway with a raised center median; constructing single lane roundabouts at Pleasant Drive and Pine Street; replacing the existing Vermillion River bridge east of 31st Street with a wider bridge that accommodates pedestrians and bicyclists; and constructing trail along the north side of CSAH 46 from General Sieben Drive to Highway 61 and along the south side from Pleasant Drive to Pine Street.

Existing Conditions

Project Benefits

Goals for the corridor included improving corridor safety and mobility, evaluating and improving non-motorized facilities, and enhancing natural resources. The project will provide the following benefits:

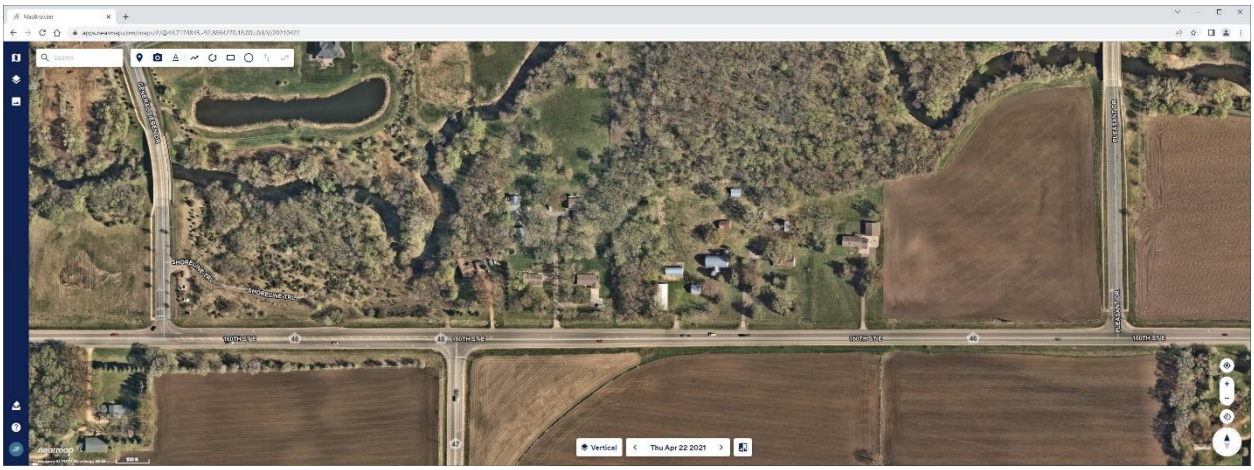
- Provide safe, equitable non-motorized facilities for travelers of all abilities connecting the community with the Vermillion River greenway, natural resources, adjacent neighborhoods, and commercial nodes along Highway 61
- Reduce potential for vehicle crashes through geometric improvements including replacing bypass lanes with dedicated turn lanes
- Improved safety and mobility through access management and intersection control improvements
- Geometric improvements to encourage consistent vehicular speeds
- Replacing the load restricted, aging Bridge #19503 over the Vermillion River with a wider facility including non-motorized accommodations
- Addressing potential future capacity issues by adding turn lanes and constructing a divided roadway section

ATTACHMENT B

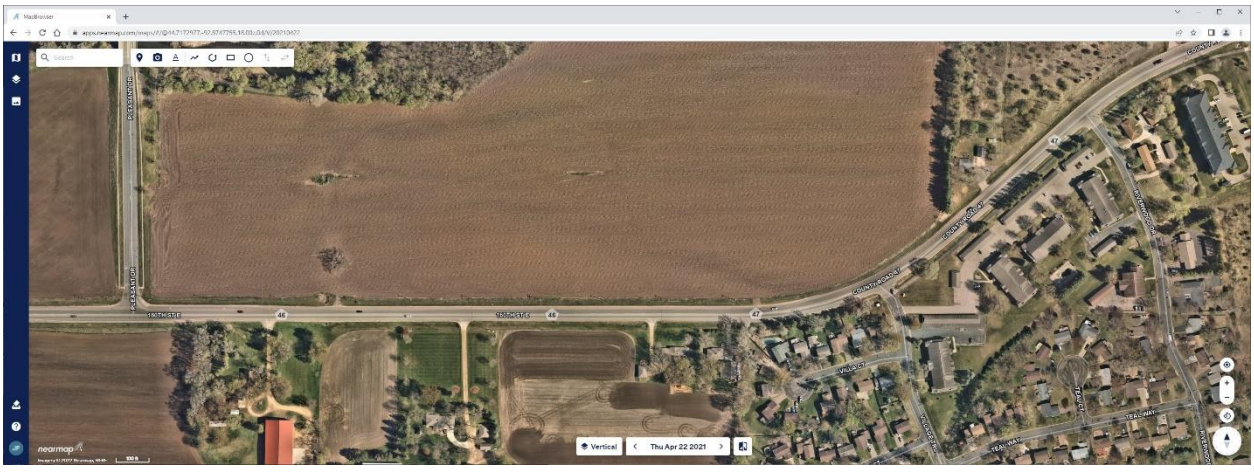
CSAH 46 Modernization Project

Existing Conditions Photos

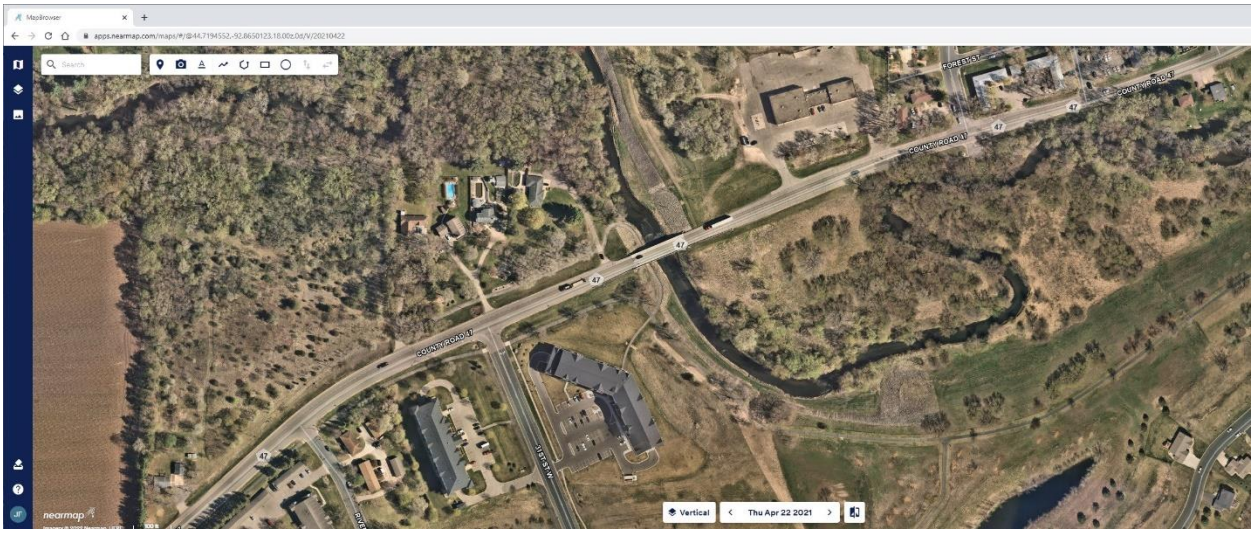
CSAH 46 Aerial – General Sieben Drive to Pleasant Drive



CSAH 46 Aerial – Pleasant Drive to Riverwood Drive

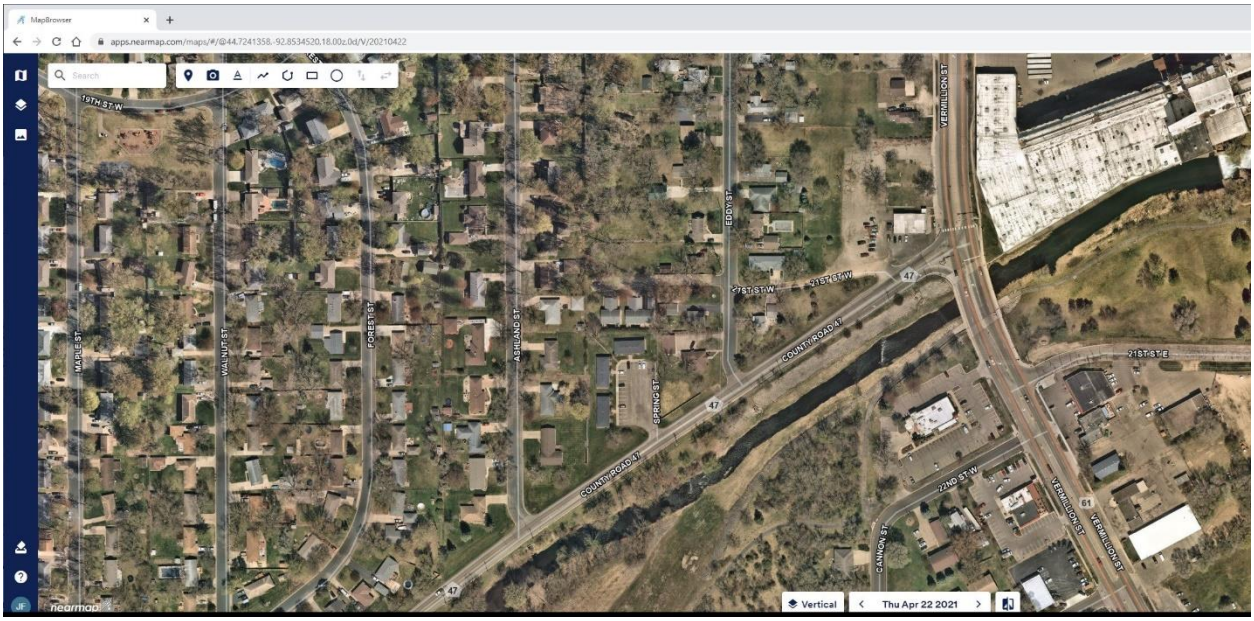


CSAH 46 Aerial – Riverwood Drive to Pine Street



CSAH 46 Aerial – Pine Street to Spring Street

CSAH 46 Aerial – Spring Street to TH 61

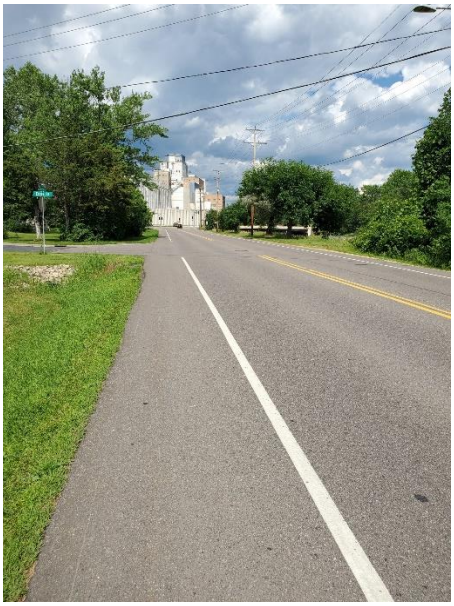


CSAH 46 Photos

Looking east from Vermillion River bridge west of General Sieben Drive

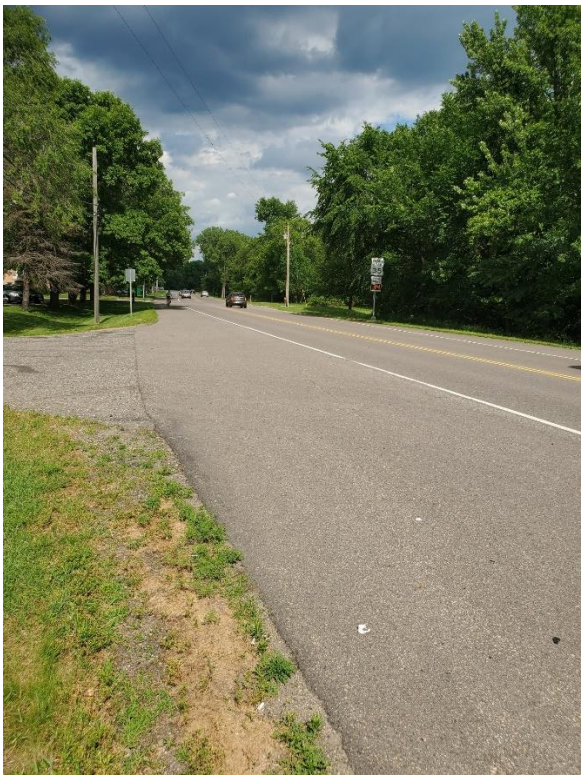
Looking west on CSAH 46 from 21st Avenue

Looking west on CSAH 46 at Eddy Street



Looking east on CSAH 46 at Spring Street

Looking west on CSAH 46 at the Vermillion River bridge east of 31st Street



Looking east on CSAH 46 at the driveway to County's maintenance facility

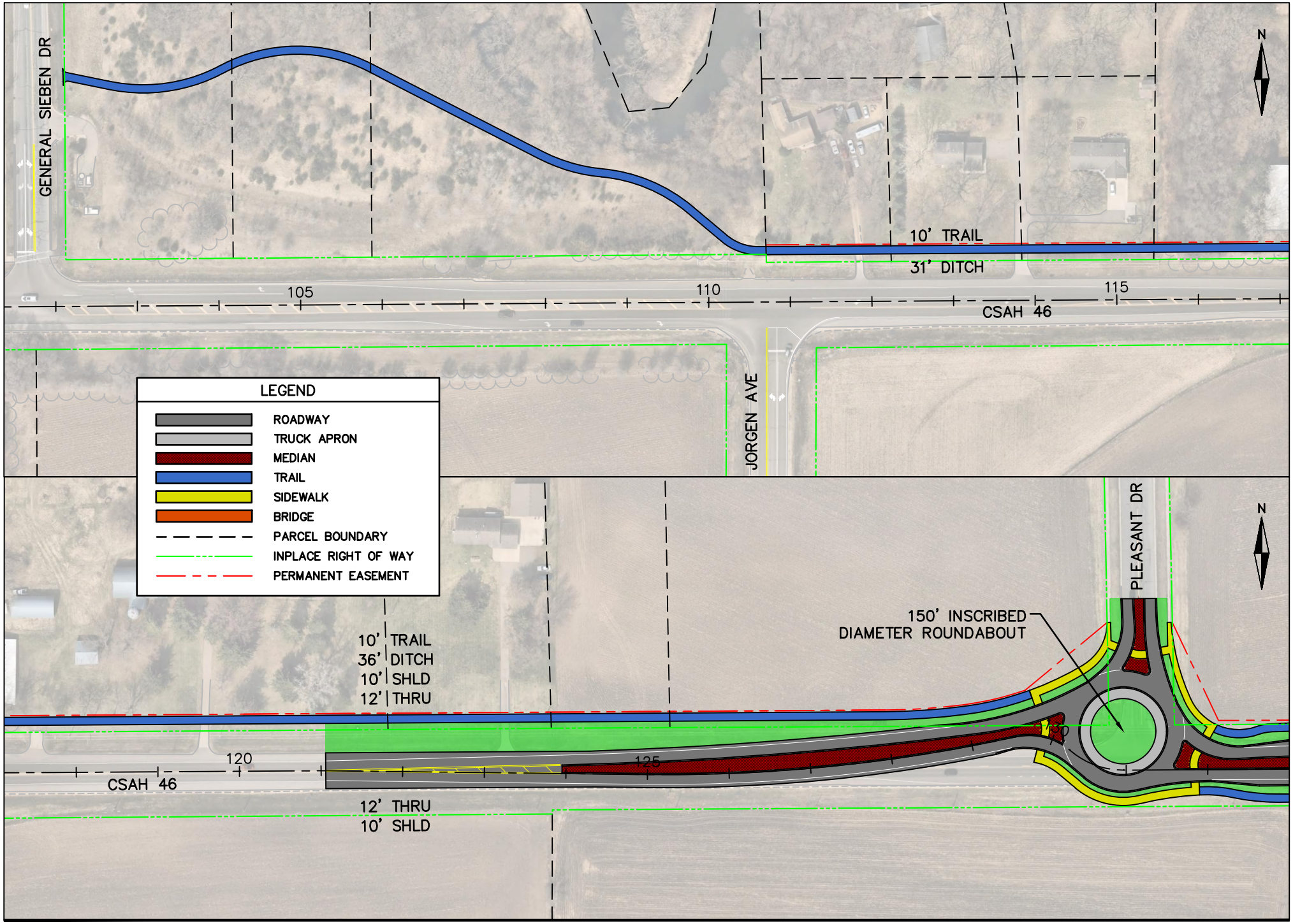
Looking east on CSAH 46 at 31st Street

Looking east on north side of CSAH 46 existing underpass

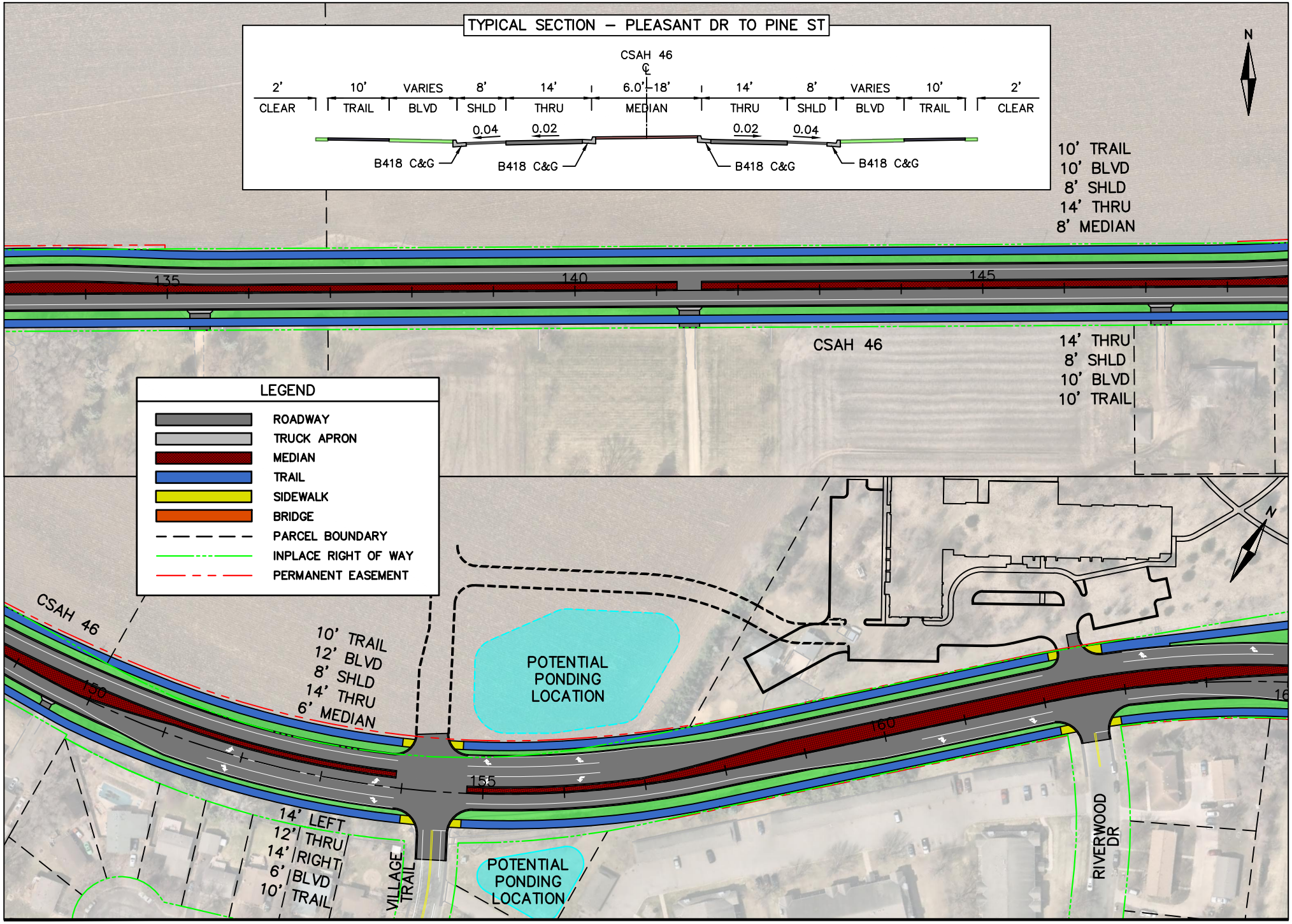
Looking west on CSAH 46 at 31st Street

Looking west on CSAH 46 at Village Trail

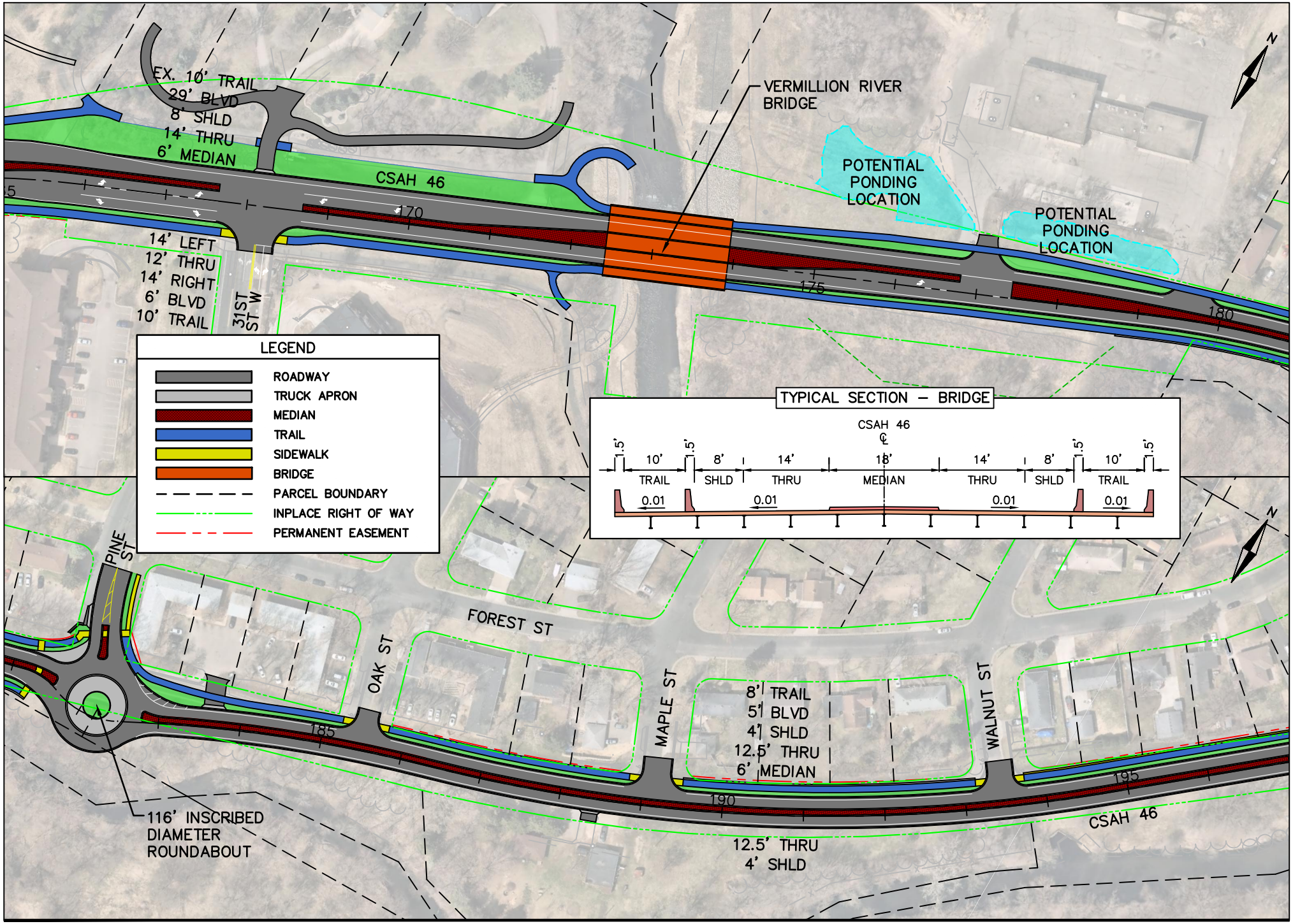
Looking south on Pleasant Drive at CSAH 46



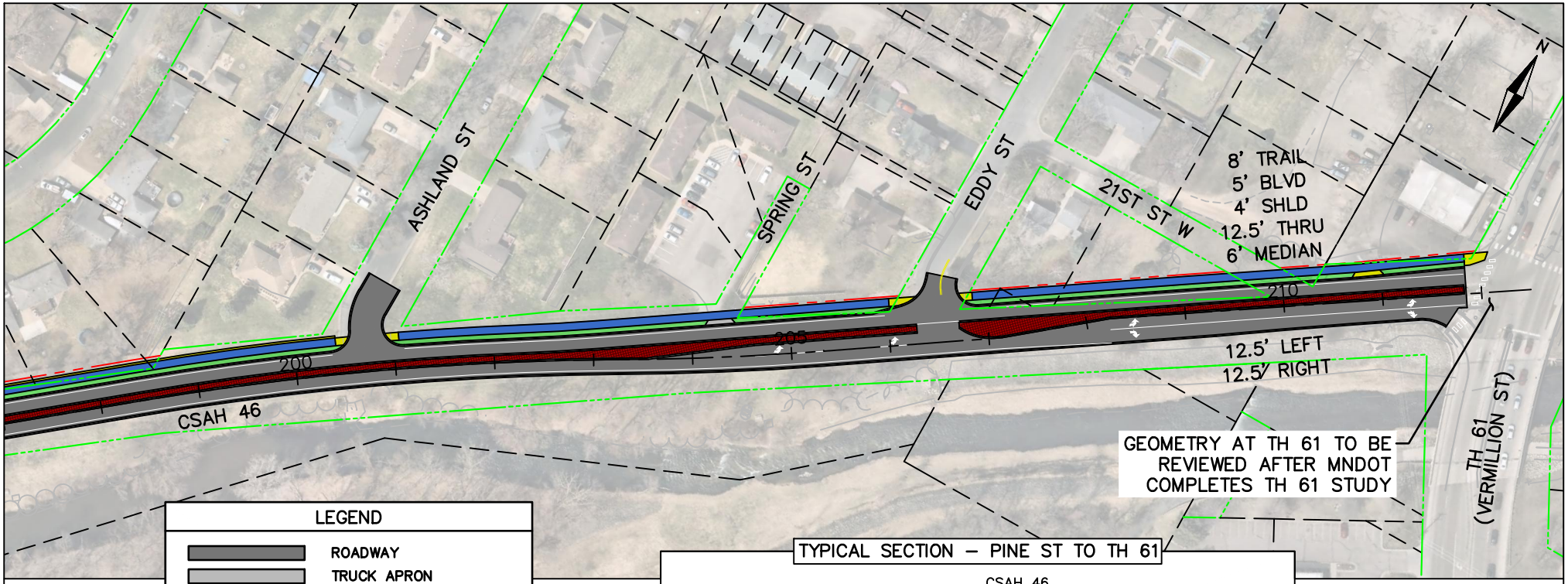
CSAH 46 - General Sieben Drive to Highway 61
Recommended Improvements



CSAH 46 - General Sieben Drive to Highway 61
Recommended Improvements



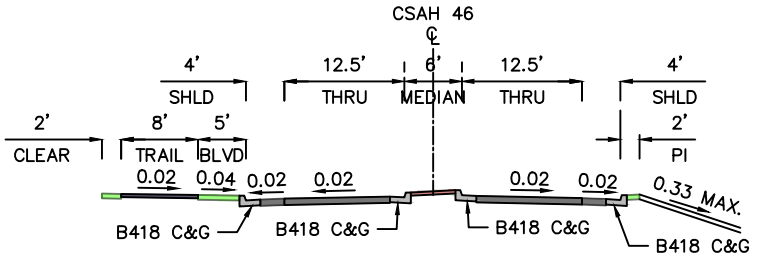
CSAH 46 - General Sieben Drive to Highway 61
Recommended Improvements

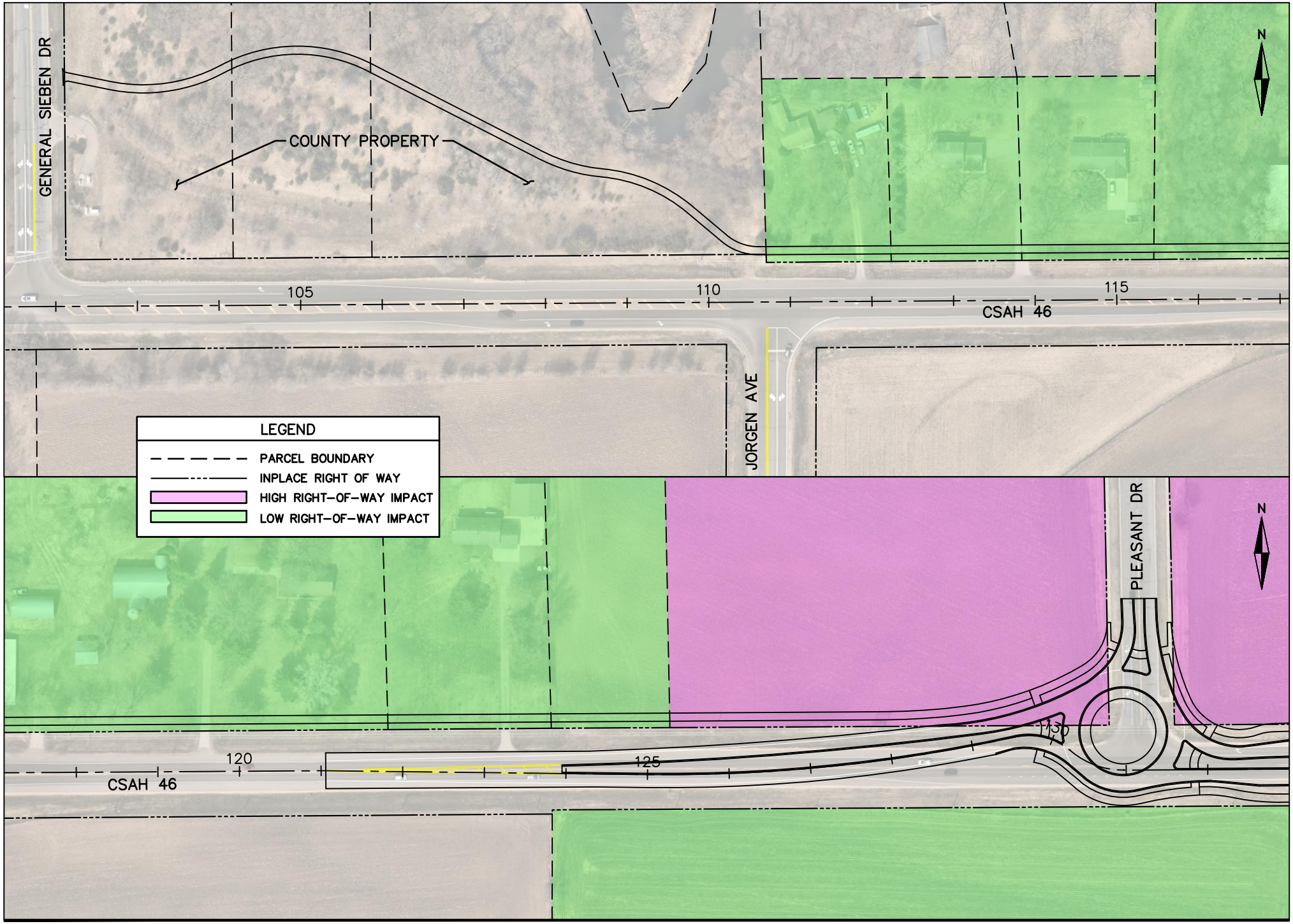


LEGEND

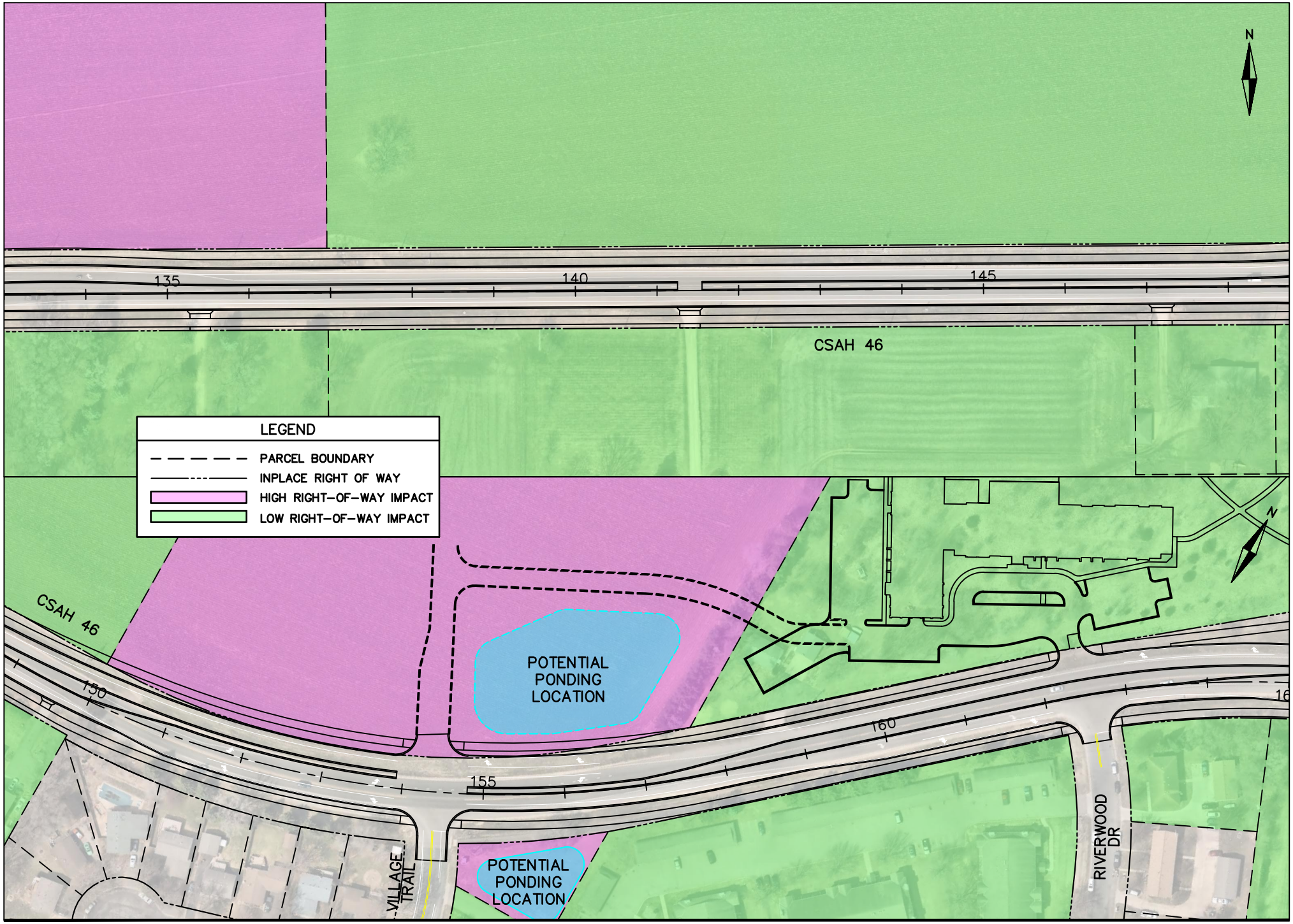
- ROADWAY
- TRUCK APRON
- MEDIAN
- TRAIL
- SIDEWALK
- BRIDGE
- PARCEL BOUNDARY
- INPLACE RIGHT OF WAY
- PERMANENT EASEMENT

TYPICAL SECTION – PINE ST TO TH 61

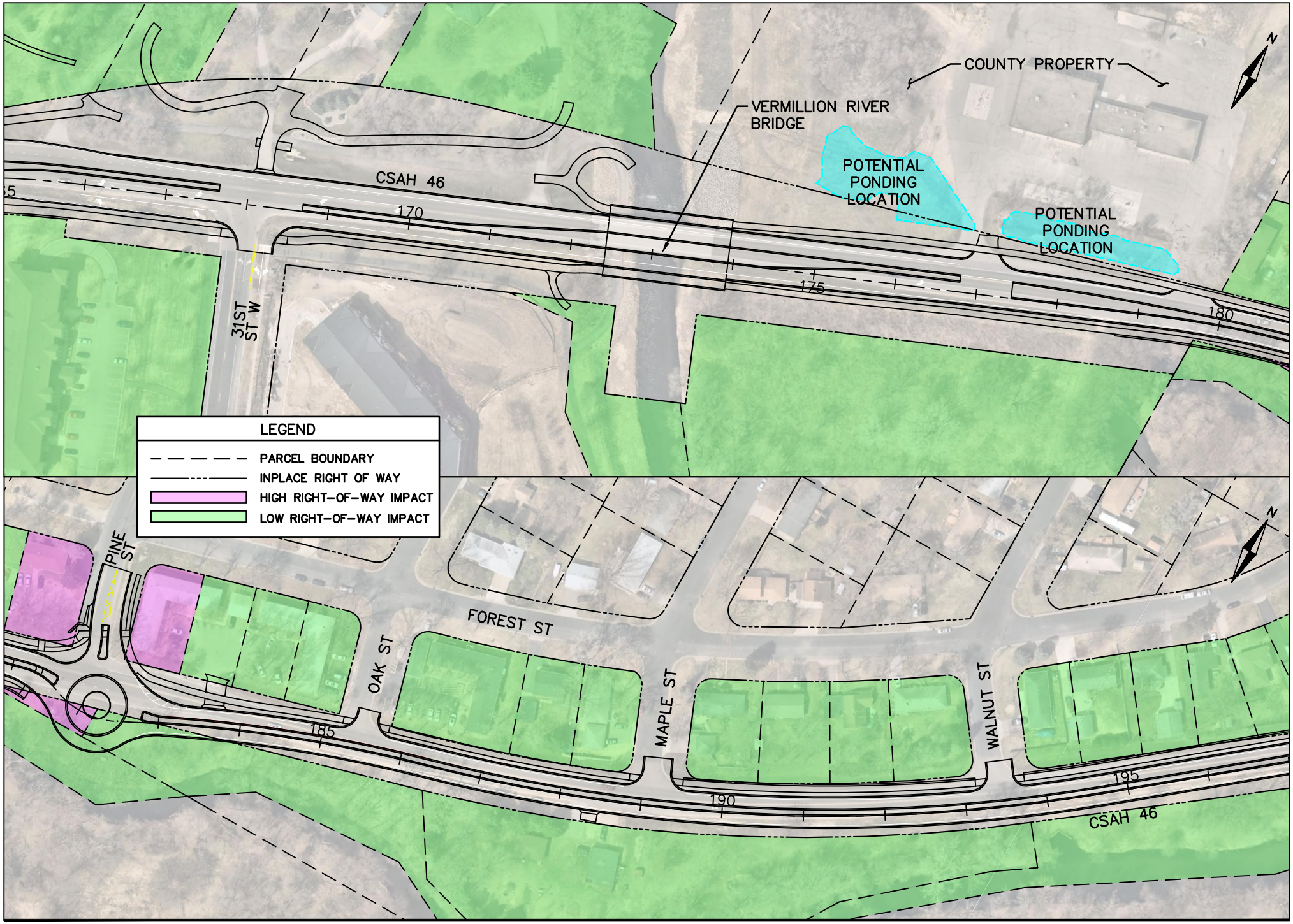




CSAH 46 - General Sieben Drive to Highway 61
Potential Right-of-Way Impacts



CSAH 46 - General Sieben Drive to Highway 61
Potential Right-of-Way Impacts



CSAH 46 - General Sieben Drive to Highway 61
Potential Right-of-Way Impacts

CSAH 46 - General Sieben Drive to Highway 61
Potential Right-of-Way Impacts

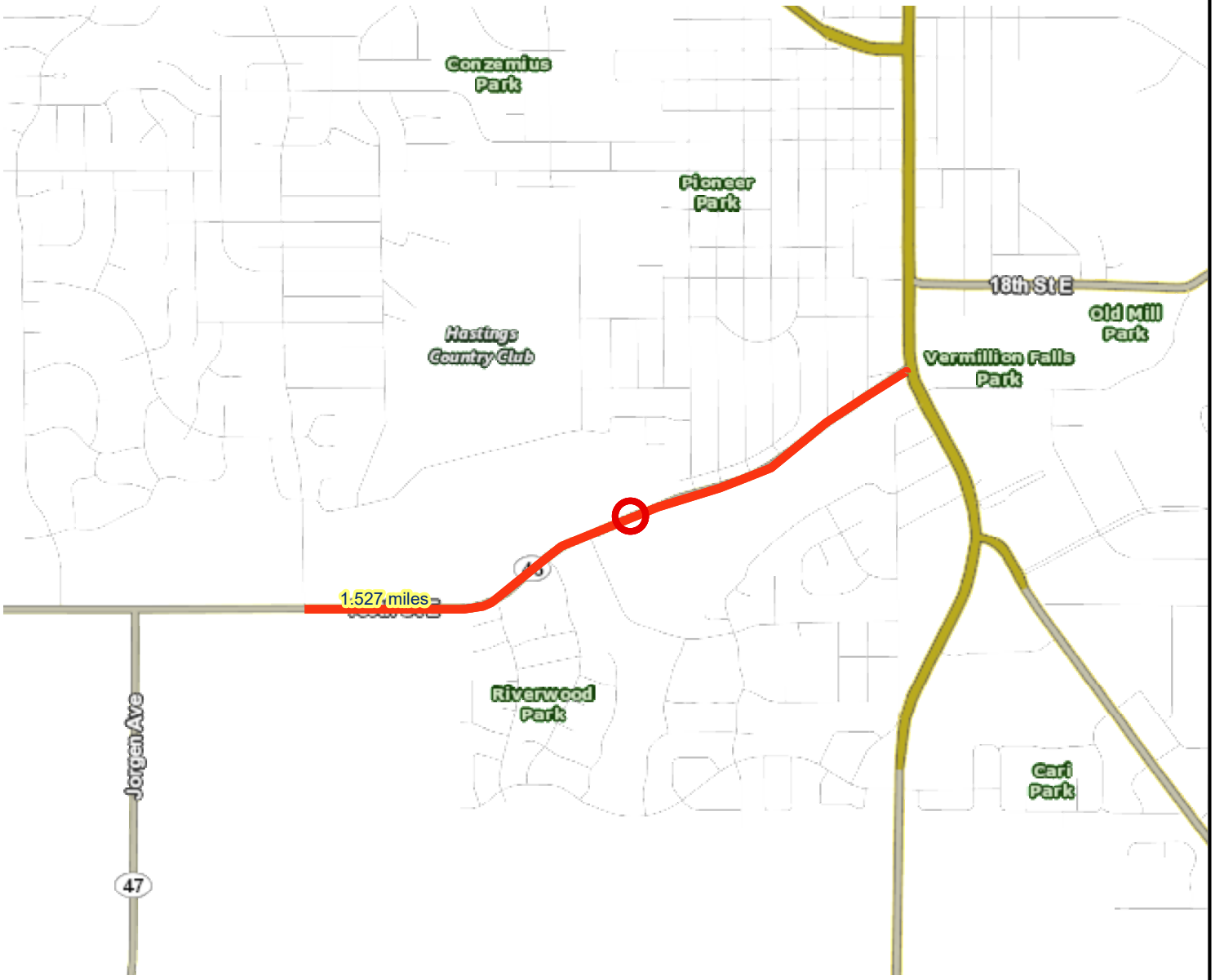
Regional Economy

Strategic Capacity Project: CSAH 46 Modernization Project | Map ID: 1649075592141

Results

WITHIN ONE MI of project:
Postsecondary Students: 0

Totals by City:
Hastings
Population: 10676
Employment: 2980
Mfg and Dist Employment: 982
Marshan Twp.
Population: 4382
Employment: 592
Mfg and Dist Employment: 165



Project Points
Project
Manfacturing/Distribution Centers
Job Concentration Centers

0 0.225 0.45 0.9 1.35 1.8 Miles

Created: 4/4/2022
LandscapeRSA5

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

METROPOLITAN COUNCIL

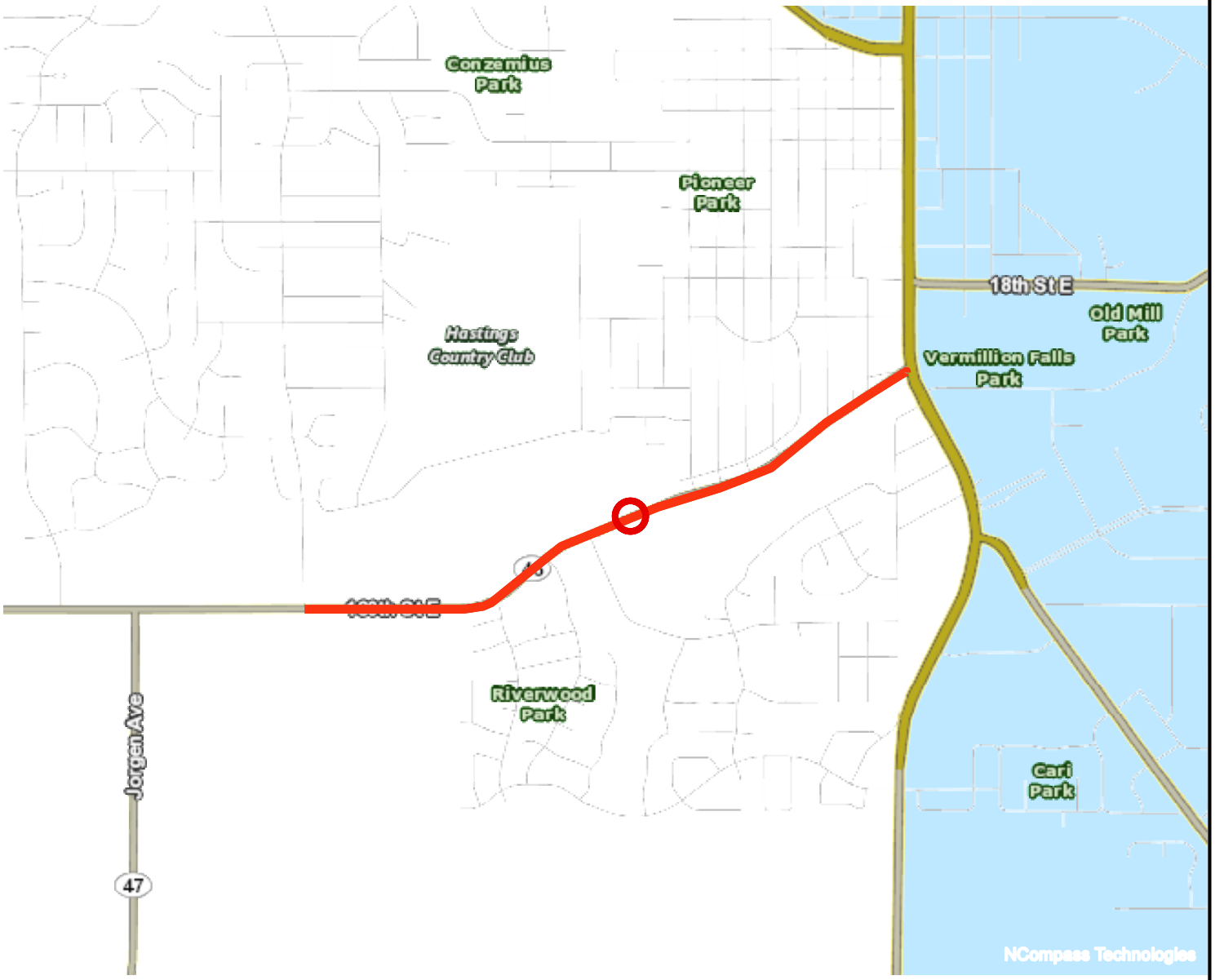
Socio-Economic Conditions

Strategic Capacity Project: CSAH 46 Modernization Project | Map ID: 1649075592141

Results

Total of publicly subsidized rental housing units in census tracts within 1/2 mile: 134

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



Points
Lines
Area of Concentrated Poverty
Regional Environmental Justice Area

0 0.225 0.45 0.9 1.35 1.8 Miles

Created: 4/4/2022
LandscapeRSA2

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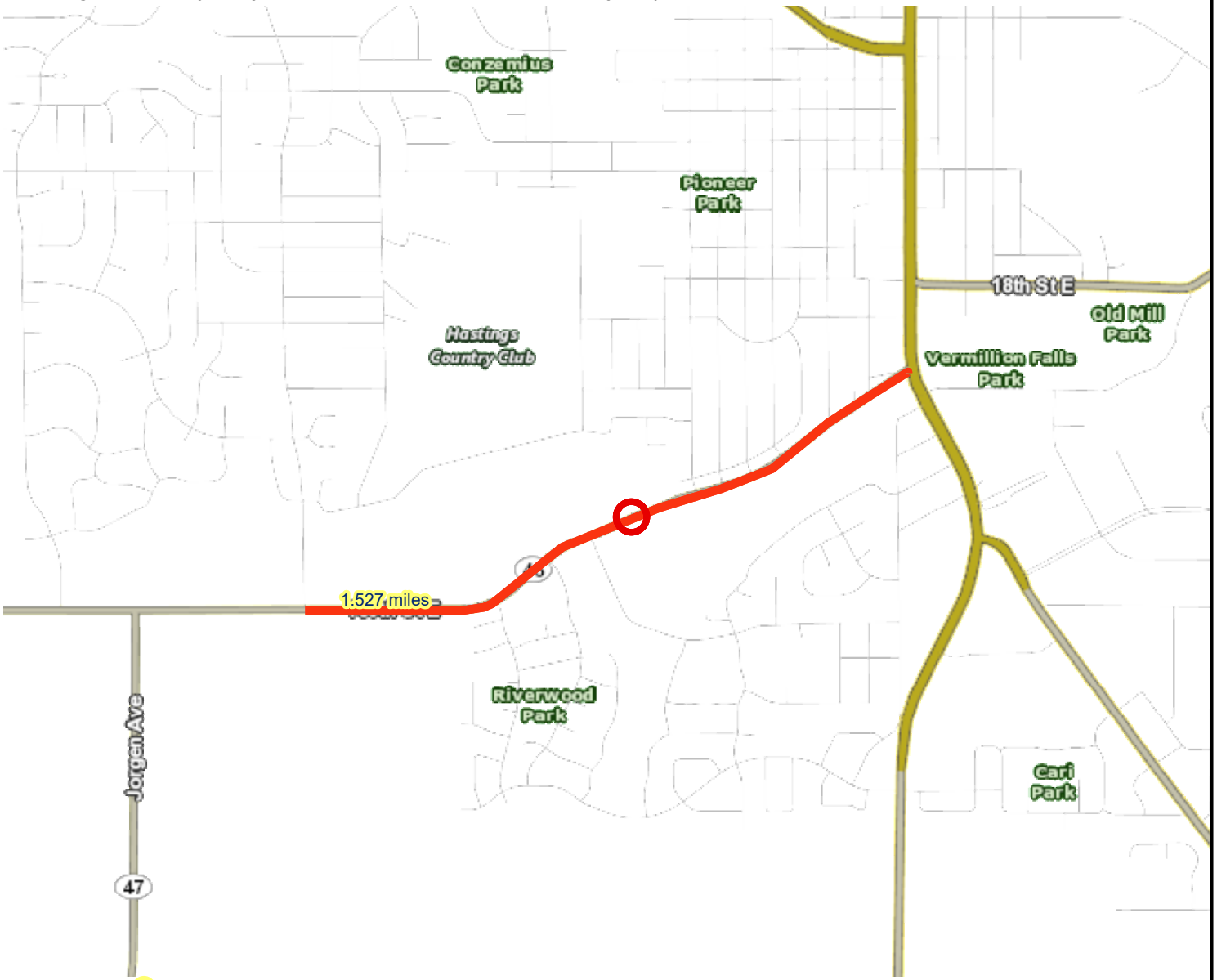
METROPOLITAN COUNCIL

Transit Connections

Strategic Capacity Project: CSAH 46 Modernization Project | Map ID: 1649075592141



Results

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

**indicates Planned Alignments*

Transit Market areas: 5

Project Points	Commuter Rail	Commuter Rail	Dedicated Bus Rapid Transit	Arterial Bus Rapid Transit	Modern Streetcar
Project	Dedicated Bus Rapid Transit	Dedicated Bus Rapid Transit	Highway Bus Rapid Transit	Commuter Rail	Undetermined
Project Area	Highway Bus Rapid Transit	Highway Bus Rapid Transit	Light Rail	Dedicated Bus Rapid Transit	
Active Stop	Light Rail	Light Rail	Modern Streetcar	Highway Bus Rapid Transit	
Arterial Bus Rapid Transit	Arterial Bus Rapid Transit	Arterial Bus Rapid Transit	Undetermined	Light Rail	

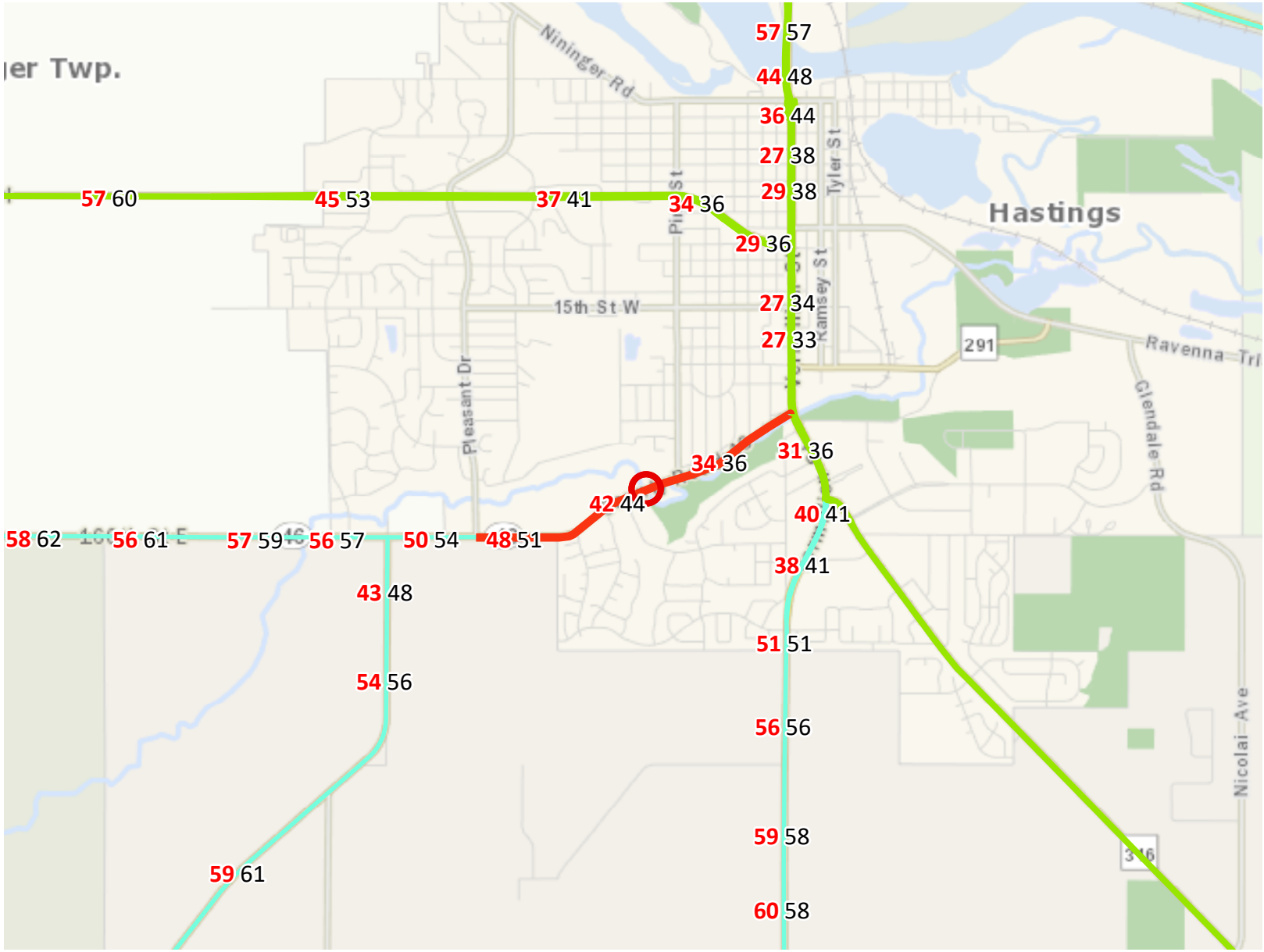
0 0.225 0.45 0.9 1.35 1.8 Miles

Created: 4/4/2022
LandscapeRSA3

METROPOLITAN COUNCIL

Level of Congestion

Strategic Capacity Project: CSAH 46 Modernization Project | Map ID: 1649075592141



Project Points — Principal Arterials — Principal Arterials Planned

Project — A Minor Arterials — A Minor Arterials Planned

0 0.4 0.8 1.6 2.4 3.2 Miles

Created: 4/4/2022
LandscapeRSA1

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METROPOLITAN COUNCIL

April 14, 2022

Metropolitan Council
Transportation Advisory Board (TAB)
ATTN: Elaine Koutsoukos, TAB Coordinator
390 Robert Street North
Saint Paul, MN 55101

RE: Fixing America's Surface Transportation (FAST) Act
Letter of Support for Dakota County's CSAH 46 (160th Street/County Road 47) reconstruction (Roadway Reconstruction/Modernization) project

Dear Ms. Koutsoukos:

The City of Hastings is supportive of Dakota County's application for federal funding for the reconstruction of CSAH 46 (160th Street/County Road 47) from Pleasant Drive east to Trunk Highway 61 as a divided 2-lane urban roadway and construct a multi-use trail along the north side of CSAH 46 from General Sieben Drive to Pleasant Drive. The project is a joint effort with Dakota County and the City of Hastings.

Dakota County and the City of Hastings partnered on a corridor study that review existing and future operations along the corridor, identified issues and needs along the corridor, hosted several community engagement events, developed short-, mid-, and long-term options, and ultimately recommended a corridor project improvement.

The study's design consultant, Alliant Engineering, has developed a draft layout based on the study recommendations and the City of Hastings concurs with the draft layout. The City of Hastings is aware of and understands the proposed project will affect Dakota County CSAH 46. Dakota County has jurisdiction over CSAH 46 and commits to operate and maintain this roadway for its design life.

The City of Hastings supports this proposed project for federal funding and agrees to provide a financial commitment for the improvements directly related to CSAH 46 within the City of Hastings, consistent with the current County cost participation policy.

We are pleased to offer our support to Dakota County for their Regional Solicitation application.

Sincerely,

Ryan Stempski, P.E.
Hastings Public Works Director/City Engineer

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

April 11, 2022

Gina Mitteco, Regional and Multimodal Transportation Manager
Dakota County

Re: MnDOT Letter for Dakota County's Metropolitan Council/Transportation Advisory Board 2022 Regional Solicitation funding request for projects

Gina,

This letter documents MnDOT Metro District's recognition for Dakota County to pursue funding for the Metropolitan Council/Transportation Advisory Board's (TAB) 2022 Regional Solicitation for the following projects.

As proposed, the projects have impacts to MnDOT right-of-way and MnDOT will allow Dakota County to seek improvements proposed in the applications. Details of any future maintenance agreement with the County will need to be determined during project development to define how the improvements will be maintained for the project's useful life if the project receives funding.

County State Aid Highway (CSAH) 46 from TH 3 to TH 52 in Coates, Empire Township and Rosemount. Project includes the reconstruction of CSAH 46 from an undivided 2-lane roadway to a divided 4-lane roadway, a trail along the north side from Trunk Highway (TH) 3, a grade separated crossing for the Vermillion Highlands Greenway, modifying the CSAH 46/TH 52 interchange bridge into 4-lane roadway, constructing roundabouts at both TH 52 ramps, pavement preservation work, and implementing access management strategies along the corridor.

CSAH 46 (160th Street) from 1,300 feet west of General Sieben Drive to Highway 61 in Hastings. The project includes the reconstruction of CSAH 46 from Pleasant Drive east to TH 61 from an undivided 2-lane roadway to a divided 2-lane roadway with turn lanes, constructing multi-use trail along the north side of CSAH 46 from General Sieben Drive to TH 61, constructing multi-use trail along the south side of CSAH 46 from Pleasant Drive to the Vermillion River Bridge (east of 31st Street), constructing single lane roundabouts at both Pleasant Drive and Pine Street, implementing access management strategies, and replacing the existing bridge over the Vermillion River (east of 31st Street).

CSAH 26 (Lone Oak Road) from TH 13 to Interstate 35E in Eagan The project will reconstruct CSAH 26 between TH 13 and Pilot Knob Road and include bicycle and pedestrian facilities and drainage improvements. The project will tie into the planned signal improvements at TH 13 and CSAH 26. The section between Pilot Knob Road and I-35E will include a mill and overlay and a 4 to 3 lane conversion.

CSAH 63 (Delaware Avenue) Trail from Marie Avenue to TH 149 (Dodd Road) in Mendota Heights and West St. Paul This project will construct a multiuse trail and sidewalk along CSAH 63 between TH 149 and Marie Avenue.

The trail and sidewalk will be included in a larger roadway reconstruction project. The project's new pedestrian and bicycle facilities will tie into the ADA facilities on TH 149.

River to River Greenway from TH 149 trail and TH 149 underpass in Mendota Heights—This project will construct an underpass of TH 149 north of TH 62.

Mendota to Lebanon Hills Greenway - TH 149 South in Mendota Heights—Project will construct a multiuse trail along TH 149 ROW connecting an existing trail along Mendota Heights Road to the existing Mendota to Lebanon Hills Greenway trail south of TH 62.

Veterans Memorial Greenway from TH 3 to CSAH 32 (Cliff Road) in Eagan and Inver Grove Heights – The project will create a grade separated pedestrian/bicycle bridge over TH 3 north of CSAH 32.

CSAH 63 (Delaware Avenue) Trail from TH 62 to Marie Avenue in Mendota Heights and West St. Paul – This project will construct a multi-use trail on the east side of Delaware between TH 62 and Marie Avenue to provide a safe pedestrian route and enhanced crossing of Delaware for students accessing Two Rivers High School. The trail will tie-in to MnDOT's ADA facilities at the intersection of TH 62 and Delaware.

There is no funding from MnDOT currently planned or programmed for these improvements. If your project receives funding, continue to work with MnDOT Area staff to coordinate needs and opportunities for cooperation.

If you have questions or require additional information at this time, please reach out to South Area Manager Ryan Wilson at ryan.wilson@state.mn.us or 651-234-4216.

Sincerely,

Michael Barnes

Digitally signed by Michael Barnes
Date: 2022.04.12 09:49:18 -05'00'

Michael Barnes, PE
Metro District Engineer

CC: Ryan Wilson, Metro District Area Manager; Dan Erickson, Metro State Aid Engineer; Molly McCartney, Metro Program Director

Thrive MSP 2040

TRANSPORTATION POLICY PLAN

Chapter 2: Transportation Strategies

2040

TRANSPORTATION POLICY PLAN

Chapter 2: Transportation Policy Plan Strategies

CONTENTS

Table 2-1: Summary matrix of goals, objectives and associated strategies

Goal	Objectives	Strategies
A. Transportation System Stewardship *Goal Statement* *Sustainable investments in the transportation system are protected by strategically preserving, maintaining, and operating system assets.*	• Efficiently preserve and maintain the regional transportation system in a state of good repair. • Operate the regional transportation system to efficiently and cost-effectively connect people and freight to destinations	A1. Regional transportation partners will place the highest priority for transportation investments on strategically preserving, maintaining, and operating the transportation system.
		A2. Regional transportation partners should regularly review planned preservation and maintenance projects to identify cost-effective opportunities to incorporate improvements for safety, lower-cost congestion management and mitigation, transit, bicycle, and pedestrian facilities.
		A3. The Council and regional transit providers will use regional transit design guidelines and performance standards, as appropriate based on Transit Market Areas, to manage the transit network, to respond to demand, and balance performance and geographic coverage.
		A4. Airport sponsors will prepare a long-term comprehensive plan (LTCP) for each airport every five years and submit it to the Metropolitan Council for review to ensure that plans for preservation, management and improvement of infrastructure at each airport are consistent with the regional aviation system plan.

Table 2-1: Summary matrix of goals, objectives and associated strategies

Goal	Objectives	Strategies
B. Safety and Security *Goal Statement* *The regional transportation system is safe and secure for all users.*	• Reduce crashes and improve safety and security for all modes of passenger travel and freight transport. • Reduce the transportation system's vulnerability to natural and man-made incidents and threats.	B1. Regional transportation partners will incorporate safety and security considerations for all modes and users throughout the processes of planning, funding, construction, operation.
		B2. Regional transportation partners should work with local, state, and federal public safety officials, including emergency responders, to protect and strengthen the role of the regional transportation system in providing security and effective emergency response to serious incidents and threats.
		B3. Regional transportation partners should monitor and routinely analyze safety and security data by mode and severity to identify priorities and progress.
		B4. Regional transportation partners will support the state's vision of moving toward zero traffic fatalities and serious injuries, which includes supporting educational and enforcement programs to increase awareness of regional safety issues, shared responsibility, and safe behavior.
		B5. The Council and regional transit providers will provide transit police services and coordinate with public safety agencies to provide a collaborative approach to safety and security.
		B6. Regional transportation partners will use best practices to provide and improve facilities for safe walking and bicycling, since pedestrians and bicyclists are the most vulnerable users of the transportation system.
		B7. Airport sponsors and air service providers will provide facilities that are safe, secure and technologically current.

Table 2-1: Summary matrix of goals, objectives and associated strategies

Goal	Objectives	Strategies
C. Access to Destinations *Goal Statement* *People and businesses prosper by using a reliable, affordable, and efficient multimodal transportation system that connects them to destinations throughout the region and beyond.*	• Increase the availability of multimodal travel options, especially in congested highway corridors. • Increase travel time reliability and predictability for travel on highway and transit systems. • Ensure access to freight terminals such as river ports, airports, and intermodal rail yards. • Increase transit ridership and the share of trips taken using transit, bicycling and walking. • Improve multimodal travel options for people of all ages and abilities to connect to jobs and other opportunities, particularly for historically under-represented populations.	C1. Regional transportation partners will continue to work together to plan and implement transportation systems that are multimodal and provide connections between modes. The Council will prioritize regional projects that are multimodal and cost-effective and encourage investments to include appropriate provisions for bicycle and pedestrian travel.
		C2. Local units of government should provide a system of interconnected arterial roads, streets, bicycle facilities, and pedestrian facilities to meet local travel needs using Complete Streets principles.
		C3. The Council, working with MnDOT through their Enhancing Financial Effectiveness (EFE) efforts, and other relevant jurisdictions, will continue to maintain a Congestion Management Process for the region's principal arterials to meet federal requirements. The Congestion Management Process will incorporate and coordinate the various activities of MnDOT, transit providers, counties, cities and transportation management organizations to increase the multimodal efficiency and people-moving capacity of the National Highway System.
		C4. Regional transportation partners will promote multimodal travel options and alternatives to single-occupant vehicle travel and highway congestion through a variety of travel demand management initiatives, with a focus on major job, activity, and industrial and manufacturing concentrations on congested highway corridors and corridors served by regional transit service.
		C5. The Council will work with MnDOT and local governments to implement a system of MnPASS lanes and transit advantages that support fast, reliable alternatives to single-occupancy vehicle travel in congested highway corridors.

Table 2-1: Summary matrix of goals, objectives and associated strategies

Goal	Objectives	Strategies
		C6. The Council will support an interagency approach to preserving right-of-way for future transportation projects that are consistent with the Transportation Policy Plan.
		C7. Regional transportation partners will manage and optimize the performance of the principal arterial system as measured by person throughput.
		C8. Regional transportation partners will prioritize all regional highway capital investments based on a project's expected contributions to achieving the outcomes, goals, and objectives identified in *Thrive MSP 2040* and the Transportation Policy Plan.
		C9. The Council will support investments in A-minor arterials that build, manage, or improve the system's ability to supplement the capacity of the principal arterial system and support access to the region's job, activity, and industrial and manufacturing concentrations.
		C10. Regional transportation partners will manage access to principal and A-minor arterials to preserve and enhance their safety and capacity. The Council will work with MnDOT to review interchange requests for the principal arterial system.
		C11. The Council and regional transit providers will expand and modernize transit service, facilities, systems, and technology, to meet growing demand, improve the customer experience, improve access to destinations, and maximize the efficiency of investments.
		C12. Regional transportation partners will invest in an expanded network of transitways that includes but is not limited to bus rapid transit, light rail, and commuter rail. Transitway investments will be prioritized based on factors that measure a project's expected contributions to achieving the outcomes, goals, and objectives identified in *Thrive MSP 2040* and the Transportation Policy Plan.

Table 2-1: Summary matrix of goals, objectives and associated strategies

Goal	Objectives	Strategies
		C13. The Council will provide paratransit service complementary to the region's regular route transit system for individuals who are certified by the Council under the Americans with Disabilities Act (ADA).
		C14. The Council and regional transit providers will provide coordinated transit options, including general public dial-a-ride and vanpool subsidies, in areas of the region not served by regular-route transit. Service levels for these options will be based on available resources and needs.
		C15. Regional transportation partners should focus investments on completing Priority Regional Bicycle Transportation Corridors and on improving the larger Regional Bicycle Transportation Network.
		C16. Regional transportation partners should fund projects that provide for bicycle and pedestrian travel across or around physical barriers and/or improve continuity between jurisdictions.
		C17. Regional transportation partners will provide or encourage reliable, cost-effective, and accessible transportation choices that provide and enhance access to employment, housing, education, and social connections for pedestrians and people with disabilities.
		C18. The Council, MnDOT, regional railroad authorities, and railroad companies will pursue short- and long-term improvements to accommodate future freight and passenger rail demand.
		C19. The Council and MnDOT should work together with cities and counties to provide efficient connections from major freight terminals and facilities to the regional highway system, including the federally designated Primary Freight Network.

Table 2-1: Summary matrix of goals, objectives and associated strategies

Goal	Objectives	Strategies
		C20. The Council and airport sponsors will maintain a system of reliever airports to augment the Minneapolis-Saint Paul International Airport that are accessible within reasonable travel times from all parts of the metropolitan area.
D. Competitive Economy *Goal Statement* *The regional transportation system supports the economic competitiveness, vitality, and prosperity of the region and state.*	• Improve multimodal access to regional job concentrations identified in *Thrive MSP 2040*. • Invest in a multimodal transportation system to attract and retain businesses and residents. • Support the region's economic competitiveness through the efficient movement of freight.	D1. The Council and its transportation partners will identify and pursue the level of increased funding needed to create a multimodal transportation system that is safe, well-maintained, offers modal choices, manages and eases congestion, provides reliable access to jobs and opportunities, facilitates the shipping of freight, connects and enhances communities, and shares benefits and impacts equitably among all communities and users.
		D2. The Council will coordinate with other agencies planning and pursuing transportation investments that strengthen connections to other regions in Minnesota and the Upper Midwest, the nation, and world including intercity bus and passenger rail, highway corridors, air service, and freight infrastructure.
		D3. The Council and its partners will invest in regional transit and bicycle systems that improve connections to jobs and opportunity, promote economic development, and attract and retain businesses and workers in the region on the established transit corridors.
		D4. The Council, MnDOT, and local governments will invest in a transportation system that provides travel conditions that compete well with peer metropolitan areas.
		D5. The Council and MnDOT will work with transportation partners to identify the impacts of highway congestion on freight and identify cost-effective mitigation.

Table 2-1: Summary matrix of goals, objectives and associated strategies

Goal	Objectives	Strategies
		D6. The Council, Metropolitan Airports Commission, MnDOT, and other agencies will work together to maintain a strong regional airport system, including maintaining the Minneapolis-Saint Paul International Airport as a major national and international passenger hub and reliever airports that serve business travel.
		D7. The Metropolitan Airports Commission should periodically update its airport economic impact studies and commercial air-service competition plan to determine facility and service improvements needed at the region's airports to foster a competitive regional economy.
E. Healthy Environment *Goal Statement* *The regional transportation system advances equity and contributes to communities' livability and sustainability while protecting the natural, cultural, and developed environments.*	• Reduce transportation-related air emissions. • Reduce impacts of transportation construction, operations, and use on the natural, cultural, and developed environments. • Increase the availability and attractiveness of transit, bicycling, and walking to encourage healthy communities and active car-free lifestyles.	E1. Regional transportation partners recognize the role of transportation choices in reducing emissions and will support state and regional goals for reducing greenhouse gas and air pollutant emissions. The Council will provide information and technical assistance to local governments in measuring and reducing transportation-related emissions.
		E2. The Council and MnDOT will consider reductions in transportation-related emissions of air pollutants and greenhouse gases when prioritizing transportation investments.
		E3. Regional transportation partners will plan and implement a transportation system that considers the needs of all potential users, including children, senior citizens, and persons with disabilities, and that promotes active lifestyles and cohesive communities. A special emphasis should be placed on promoting the environmental and health benefits of alternatives to single-occupancy vehicle travel.

Table 2-1: Summary matrix of goals, objectives and associated strategies

Goal	Objectives	Strategies
	• Provide a transportation system that promotes community cohesion and connectivity for people of all ages and abilities, particularly for historically under-represented populations.	E4. Regional transportation partners will protect, enhance and mitigate impacts on natural resources when planning, constructing, and operating transportation systems. This will include management of air and water quality and identification of priority natural resources through the Natural Resources Inventory developed by the Council and Minnesota Department of Natural Resources.
		E5. Transportation partners will protect, enhance and mitigate impacts on the cultural and built environments when planning, constructing, and operating transportation systems.
		E6. Regional transportation partners will use a variety of communication methods and eliminate barriers to foster public engagement in transportation planning that will include special efforts to engage members of historically underrepresented communities, including communities of color, low-income communities, and those with disabilities to ensure that their concerns and issues are considered in regional and local transportation decision making.
		E7. Regional transportation partners will avoid, minimize and mitigate disproportionately high and adverse impacts of transportation projects to the region's historically underrepresented communities, including communities of color, low-income communities, and those with disabilities.

Table 2-1: Summary matrix of goals, objectives and associated strategies

Goal	Objectives	Strategies
F. Leveraging Transportation Investments to Guide Land Use *Goal Statement* *The region leverages transportation investments to guide land use and development patterns that advance the regional vision of stewardship, prosperity, livability, equity, and sustainability.*	• Focus regional growth in areas that support the full range of multimodal travel. • Maintain adequate highway, riverfront, and rail-accessible land to meet existing and future demand for freight movement. • Encourage local land use design that integrates highways, streets, transit, walking, and bicycling. • Encourage communities, businesses and aviation interests to collaborate on limiting incompatible land uses that would limit the use of the region's airports.	F1. Local governments within the seven-county metropolitan area must prepare comprehensive plans that conform to the Transportation Policy Plan and should recognize the land use and transportation opportunities and challenges that correspond to *Thrive MSP 2040* planning areas. Local governments within the Metropolitan Urban Service Area should plan for their projected growth and stage their transportation infrastructure to accommodate the needs of that growth. Local governments in the Rural Service Area should plan for transportation systems and land use patterns that are compatible with the protection of agricultural uses and the need for future sewered development.
		F2. Local governments should plan for increased density and a diversification of uses in job concentrations, nodes along corridors, and local centers to maximize the effectiveness of the transportation system.
		F3. Metropolitan Council, MnDOT, and local governments will plan, build, operate, maintain, and rebuild an adequate system of interconnected highways and local roads.

Table 2-1: Summary matrix of goals, objectives and associated strategies

Goal	Objectives	Strategies
		F4. Local governments will identify opportunities for and adopt guiding land use policies that support future growth around transit stations and near high-frequency transit service. The Council will work with local governments in this effort by providing technical assistance and coordinating the implementation of transit-oriented development. The Council will also prioritize investments in transit expansion in areas where infrastructure and development patterns to support a successful transit system are either in place or committed to in the planning or development process.
		F5. Local governments should lead planning efforts for land use in transit-oriented station areas, small-areas, or corridors, with the support of the Council and other stakeholders.
		F6. Local governments should adopt policies, develop partnerships, identify resources, and consider regulatory tools to support and specifically address the opportunities and challenges related to creating walkable, bikeable, transit-friendly places.
		F7. Local governments should include bicycle and pedestrian elements in local comprehensive plans.
		F8. Local governments should adopt comprehensive plans that include policies emphasizing identifying and improving roads best suited for carrying trucks while minimizing impacts such as noise and traffic to sensitive land uses.
		F9. Local governments should balance the needs of industrial, residential and recreational users when planning and implementing land uses along the navigable portions of the Mississippi River system to ensure sufficient access for existing and future barge transportation needs.

Table 2-1: Summary matrix of goals, objectives and associated strategies

Goal	Objectives	Strategies
		F10. Local governments should consider the role of railroads in promoting economic activity and identify an adequate supply of land in their comprehensive plans to meet existing and future demand for industrial uses requiring rail access.
		F11. Local governments located near all of the region's airports should address land use compatibility and air safety requirements in their comprehensive plans.
		F12. Communities affected by aircraft noise should incorporate the Land Use Compatibility Guidelines for Aircraft Noise into their local comprehensive plans and ordinances.
		F13. Local governments should minimize potential general airspace hazards by adopting federal and state regulations regarding airspace and notifying potential developers of the need to submit FAA form 7460-1 regarding structure height near an airport.

Dakota COUNTY

Dakota County 2040 Transportation Plan

July 2021

Dakota COUNTY transportation
we get you there

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Implementation

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Chapter 7

Goal 4: Replacement and Modernization of Deficient Elements of the System

Transportation system elements such as pavement and bridges deteriorate over time. Even with proactive preservation over the life of the transportation system, replacement eventually becomes the most cost-effective approach. Additionally, standards and practices change, affecting system safety and operation to maintain safe and efficient movement of people and goods. Therefore, the county will replace and modernize deficient elements of the transportation system as they become structurally or functionally obsolete to enhance safety and efficiently operate the system.

Goal Purpose

This goal provides measures, strategies and policies aimed at replacement and modernization of four important elements of the transportation system – bridges, highways, traffic signals and gravel roads. It also provides current and future estimated investments and measures for replacement of key transportation system elements.

Modernization of the transportation system includes the addition of shoulders, turn lanes, and medians to reduce crashes and channelize traffic to efficiently move vehicles. Pedestrians and bicyclists are also accommodated with the addition of trails and sidewalks. Installation of street lighting at school zones and pedestrian crossings improves safety for vulnerable users. Each of these elements are considered on highway replacement and modernization projects.

The strategies and policies of this goal provide for current and future estimated investment needs for replacement of key transportation system elements. Replacement and modernization of the transportation system will be pursued through the following CIP investment categories.

CIP Investment Categories

- Highway Replacement and Modernization
- Bridge Replacement
- Gravel Road Paving
- Traffic Signal Replacement
- Through-Lane Reduction
- Two- to Three-Lane Modernization

Highway Replacement and Modernization

The county reconstructs highways when they have exceeded their functional lives. The highway useful life is based on the adequacy of structural, operational or functional highway elements. Safety, operational and modernization improvements are also incorporated into reconstruction projects when appropriate. Even with proactive preservation, eventually highway replacement becomes the most cost-

effective approach for safe and efficient maintenance and operation of the system. The county considers the general expected highway life to be approximately 70 years. The current Dakota County highway system age is shown by highway segment in Figure 31.

Highway age will be one factor in considering reconstruction and modernization needs of a highway. Additional analysis including assessment of safety, consideration of bicycle and pedestrian accommodation, and the structure of the individual highway segments will be conducted to better determine the actual replacement and modernization needs. Replacement and modernization projects may consist of a wide variety of improvement types depending on the actual needs and condition of the particular highway segment. Future prioritization and timing of projects will still be based on a number of factors per Plan priorities, strategies, and policies.

The following are the estimated annual CIP investments for highway replacement and modernization over the plan period including estimated investments for County Roads:

- 2021-2025 = $17.9 million ($9.0 million for County Roads)
- 2026-2030 = $24.3 million ($2.5 million for County Roads)
- 2031-2040 = $12.6 million ($0.7 million for County Roads)

PERFORMANCE MEASURE: The County will consider reconstruction and modernization of County highways when they have exceeded their functional lives, generally expected to be approximately 70 years. This includes consideration of the adequacy of the structure and operation of functional highway elements including age, multi-modal accommodation, safety assessment and cost effectiveness.

The following ***policy*** supports replacement and reconstruction of deficient highway elements of the system.

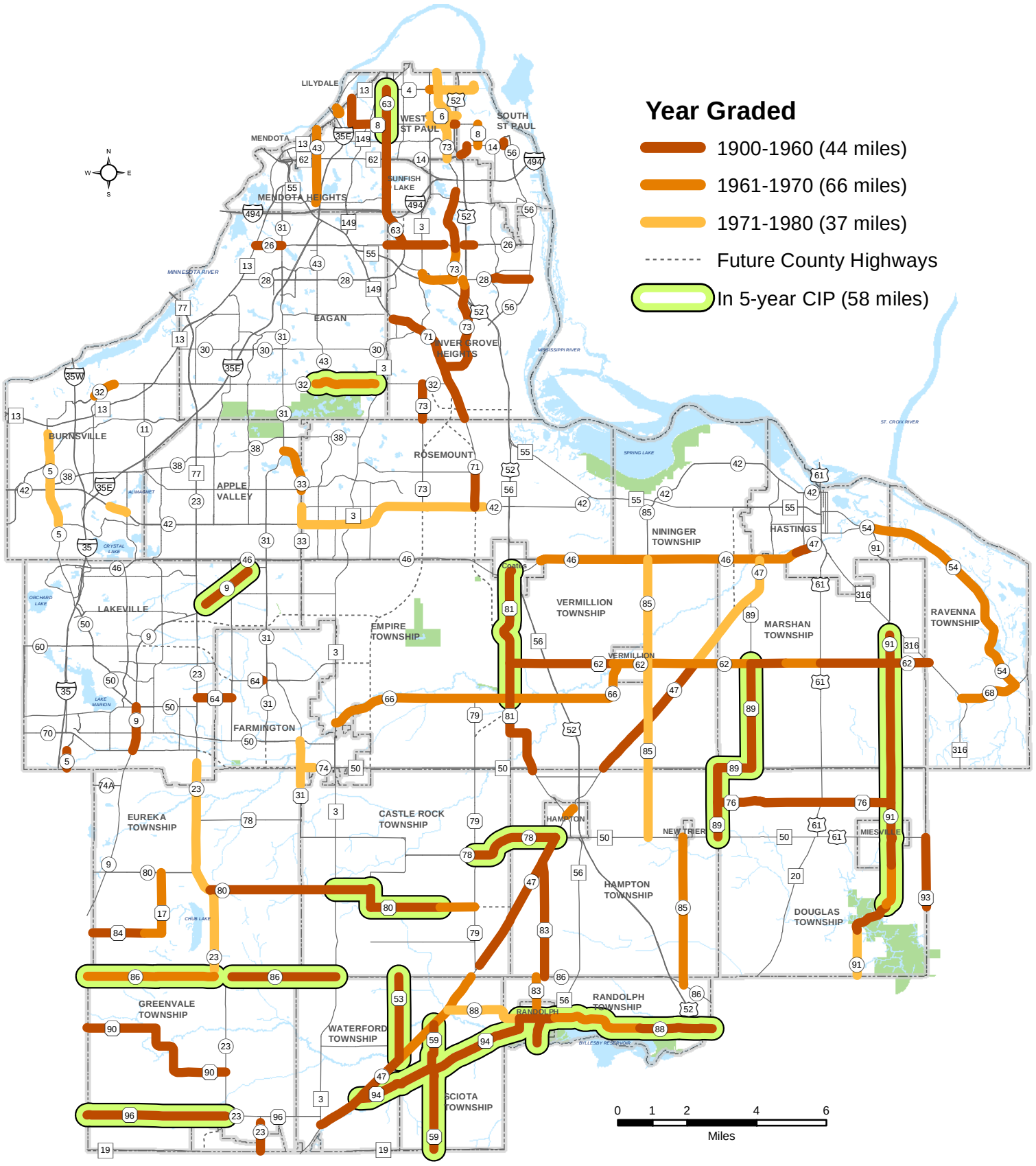
R.1 Highway Replacement
Reconstruct and modernize highways or highway elements that have exceeded their useful life based on structural, functional, operational or safety factors.

Bridge Replacement

The county uses the Local Planning Index (LPI) for bridges that was recently established by the Minnesota Department of Transportation (MnDOT) to monitor the operation quality of bridges. The LPI is a risk score which factors both the consequence of a service interruption and the probability of service interruption. The following factors are considered in determining the probability of a bridge failure:

- Bridge condition
- Vertical clearance
- Scour
- Load rating
- Fatigue
- Fracture critical status

Dakota County Road Age



Prepared by:
Dakota County Office of GIS, 2/2021.

Dakota County 2040 Transportation Plan - Figure 31

The following factors are considered in determining the consequence of failure:

- Traffic volume
- Detour length
- Bridge length
- Local considerations (such as impacts to industry, trade and agriculture)

The LPI is an improvement to the sufficiency rating that the county has used in the past and uses a more risk-based approach. The sufficiency rating is no longer being used by the Federal Highway Administration (FHWA) or MnDOT.

To monitor operation quality of bridges, the county conducts annual bridge inspection to determine the LPI. As bridges age over the plan period, bridge replacement investment will continue to be necessary. county bridges are shown in Figure 32.

PERFORMANCE MEASURE: The county will have no bridges under its jurisdiction that have a Local Planning Index (LPI) rating of 80 or less.

The following are the estimated annual CIP investments for bridge replacement over the plan period including estimated investments for County Roads:

- 2021-2025 = $0.2 million ($0 for County Roads)
- 2026-2030 = $0.5 million ($0.1 million for County Roads)
- 2031-2040 = $0.5 million ($.0.1 million for County Roads)

The following ***strategies*** support replacement of deficient bridge elements.

- **Bridge Replacement - Condition**
  Replace bridges determined as deficient according to state guidelines and funding availability.

- **Bridge Replacement – Adjacent Highway Project**
  Replace bridges if an adjacent highway project necessitates replacement for functional or safety reasons.

- **Bridge Replacement – Beyond 20-Year Needs**
  Anticipate traffic needs beyond 20-year ADT to determine bridge design elements.

- **Bridge Replacement – Funding**
  Pursue federal and state funds for the replacement of eligible bridges.

- **Township Bridge Program**
  Assist townships with administration of Township Bridge Program. Funding for township bridge replacements will be pursued from the Township Bridge Program, State Bridge Bonds, and townships in accordance with state program criteria. The ability to accomplish township bridge projects is contingent upon eligibility and availability of funds. Townships are responsible for funding any costs not provided for by the state and concurrence with consultant selection and coordination of project schedule. The County Engineer may be the administrator or the township agent. Typically, county staff will:

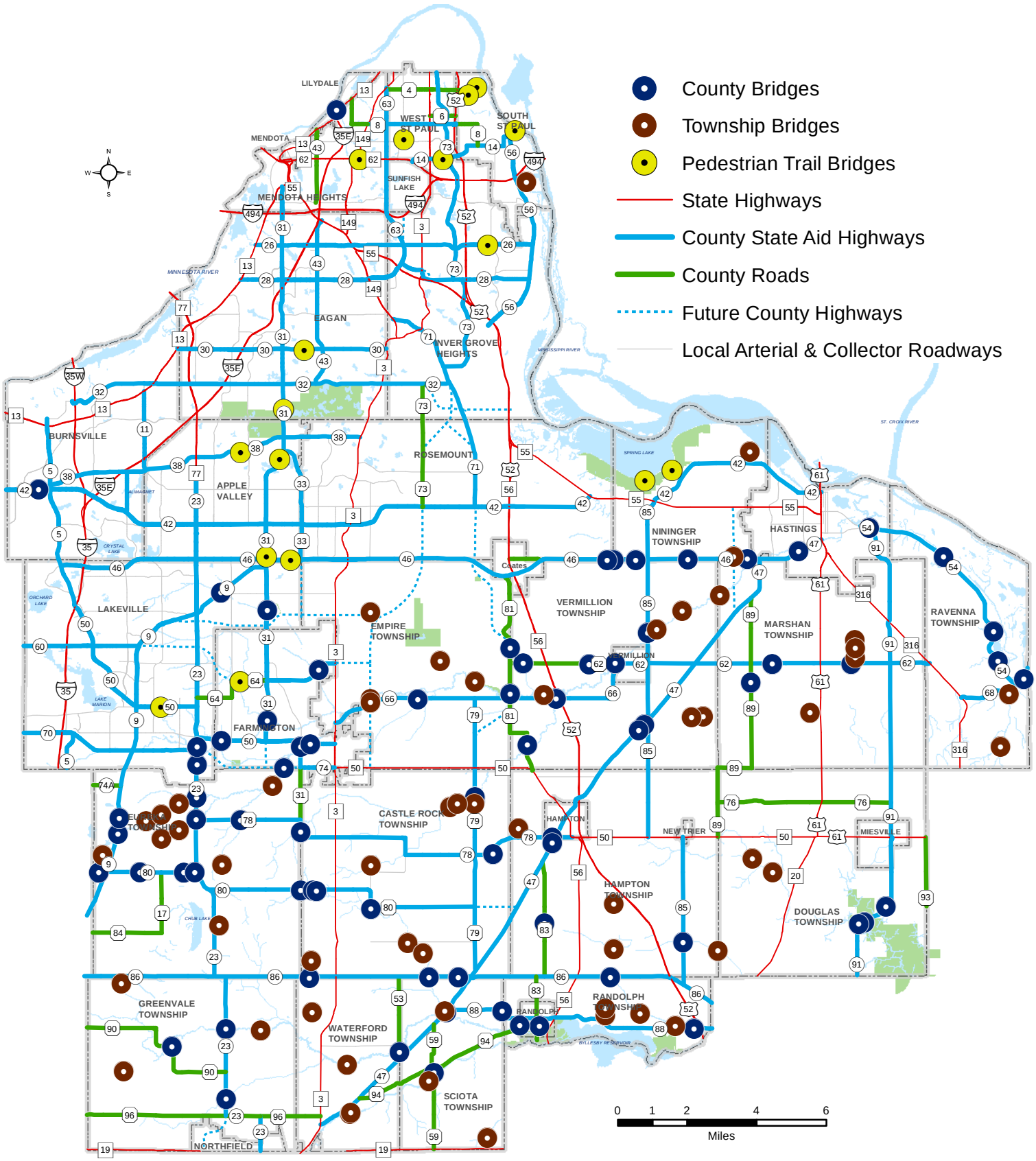
- Assist with pursuit and administration of State Bridge funding; and
- Administer plan and specification submittal and review by the state

- **Timber Bridge Replacement**
  Replace timber bridges that have exceeded the design life of 50 years or that have succumbed to substructure decay and cannot be rehabilitated.

The following ***policy*** supports replacement of deficient bridge elements of the system.

R.2 Bridge Inspections
Perform bridge inspections of county bridges in accordance with applicable laws and rules.

County Bridges



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Dakota County 2040 Transportation Plan - Figure 32

- 2021-2025 = $1.4 million ($0 for County Roads)
- 2026-2030 = $1.4 million ($0 for County Roads)
- 2031-2040 = $1.8 million ($0 for County Roads)

The following **strategy** supports replacement and reconstruction of deficient highway elements of the system.

- **Traffic Signal Replacement**
  Apply preventative maintenance techniques to defer the need for signal replacement. Prioritize traffic signal replacement for signals that exceed their operational or functional life, typically around 30 years of age. The replacement signal selection process consists of considering operation, maintenance needs and collaboration with cities in consideration of cost share policies through the following steps:
    1) Apply preventive maintenance techniques to defer the need for signal replacement;
    2) Evaluate traffic control per Policy M.10 Intersection Traffic Control Changes; and
    3) Evaluate the scope of signal replacements on a case-by-case basis.

    When it is determined that a signal replacement is the appropriate action, the signal replacement will include updating the system to current standards including ADA criteria, Advanced Traffic Management System (ATMS) updates and other current design elements as applicable to the specific location.

Three-Lane Road Sections

Three lane road sections are comprised of a through travel lane in each direction and a left turn lane, either with or without medians, at all cross-road intersections. These sections typically also include right turn lanes and shoulders. Because these sections separate turning from through traffic, they provide a high level of safety and efficient movement of traffic with a minimal roadway footprint. They work well for daily traffic volumes of 10,000 to 18,000 vehicles and promote safety through minimized weaving when compared to multi-lane through sections, dedicated lanes for turning traffic, and shorter distances for pedestrian crossings. Three-lane sections typically have lower crash and severity rates when compared to multi-lane road sections. They are less expensive, and less impactful to construct than roadway sections with multiple through lanes and have lower annual operating and maintenance costs. Further, they can be designed for cost effective expansion to the outside of the roadway if longer term traffic needs warrant additional lanes. Two approaches are identified to implement three lane road sections where they are applicable to the county highway system based on anticipated 2040 traffic volumes.

Through-Lane Reduction

Through-lane reductions is a newer approach to properly size a highway to fit its anticipated volumes. Approximately 6 miles of four-lane highways have been identified as candidates for reduction to three-lane sections to improve safety and operation of these highways based on 2040 traffic volumes. Highway segments for consideration are shown in Figure 35. These segments have a 2040 anticipated traffic volume of 80 percent or less than the 18,000 capacity for a three-lane highway section, or 14,400 vehicles per day. This is also less than the minimal projected 20-year traffic of 15,000 vehicles per day where a four-lane section would typically be considered. Thus, these segments are considered over-sized and may see safety and operational benefits from a reduction in through lanes. Through-lane reduction of four-

lane highways to three-lane highways will be considered based on other highway segment needs and consultation and agreement with local jurisdictions. The most appropriate time to consider conversion is at a time when pavement overlay or reconstruction and modernization is required.

The following are the estimated annual CIP investments for through-lane reductions over the plan period including estimated investments for County Roads:

- 2021-2025 = $1.0 million ($0 for County Roads)
- 2026-2030 = $0.4 million ($0 for County Roads)
- 2031-2040 = $0.4 million ($0 for County Roads)

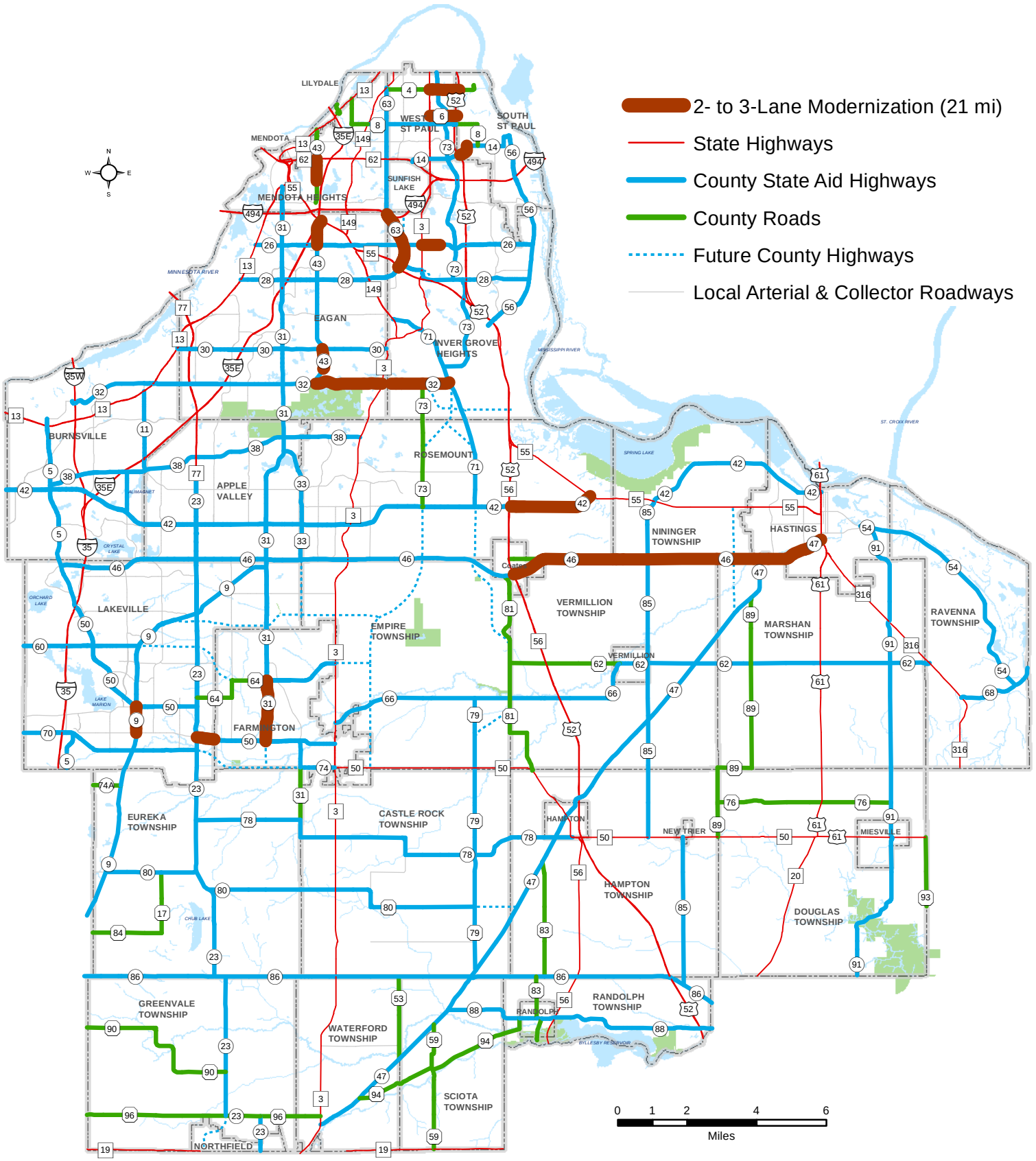
Two-Lane to Three-Lane Modernization

For two-lane highways requiring replacement and modernization that have an anticipated future traffic volume between 10,000 and 15,000 ADT, a three-lane modernization improvement will be considered. This modernization includes improvements to the existing two-lane highway to include left and right turn lanes, medians, shoulders, trails and sidewalks. This type of improvement does not include additional through lanes. Approximately 21 miles of two-lane highways have been identified as candidates for three-lane modernization. Highway segments for consideration are shown in Figure 36.

The following are the estimated annual CIP investments for two-lane to three-lane modernization over the plan period including estimated investments for County Roads:

- 2021-2025 = $1.5 million ($0 for County Roads)
- 2026-2030 = $1.5 million ($0 for County Roads)
- 2031-2040 = $1.5 million ($0 for County Roads)

Two- to Three-Lane Modernization



Prepared by:
Dakota County Office of GIS, 2/2021.

Dakota County 2040 Transportation Plan - Figure 36

Goal 4 Summary

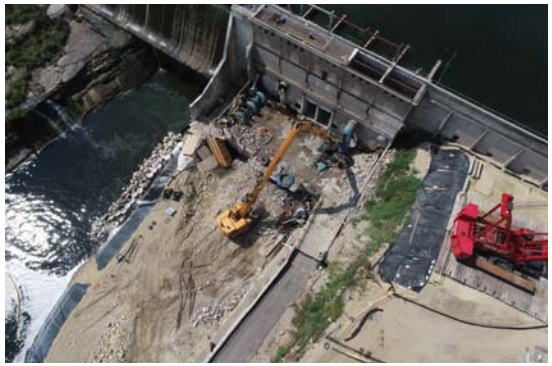
The emphasis of this goal is to address the transportation system elements that have deteriorated over time through replacement and modernization. The goal recognizes that even with proactive preservation of system elements replacement and modernization eventually becomes the most cost-effective approach. Replacement and modernization investments are focused on highway replacement and reconstruction, bridge replacement, gravel paving, traffic signal replacement, through-lane reduction and two-lane to three-lane improvements. These investments are made as these transportation system elements age and deteriorate to the point where preservation techniques are no longer practical or cost effective. The following are the estimated annual CIP replacement and modernization needs and investments over the plan period.

	Annual Replacement & Modernization Investment Needs					
	2021-2025		2026-2030		2031-2040	
REVENUE/EXPENSE	CSAH	CR	CSAH	CR	CSAH	CR
Highway Replace. & Modern.	$ 13.97	$ 1.99	$ 18.11	$ 1.21	$ 8.51	$ 0.60
Bridge Replacement	$ 0.18	$ -	$ 0.40	$ 0.06	$ 0.40	$ 0.06
Gravel Road Paving	$ -	$ 6.99		$ 0.60	$ -	$ -
Traffic Signal Replacement	$ 1.35	$ -	$ 1.35	$ -	$ 1.83	$ -
Through-Lane Reduction	$ 0.95	$ -	$ 0.41	$ -	$ 0.41	$ -
Two- To Three-Lane Modern.	$ 1.45		$ 1.45		$ 1.45	
ANNUAL AVERAGE	**$ 17.90**	**$ 8.98**	**$ 21.72**	**$ 1.87**	**$ 12.60**	**$ 0.66**

CAPITAL IMPROVEMENT PROGRAM

Dakota COUNTY

2022-2026



Capital Improvement Program
2022-2026

Dakota County Board of Commissioners

Mike Slavik, First District
Kathleen A. Gaylord, Second District
Laurie Halverson, Third District
Joe Atkins, Fourth District
Liz Workman, Fifth District
Mary Liz Holberg, Sixth District
Mary Hamann-Roland, Seventh District

Dakota County Manager

Matt Smith

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Capital Improvement Program

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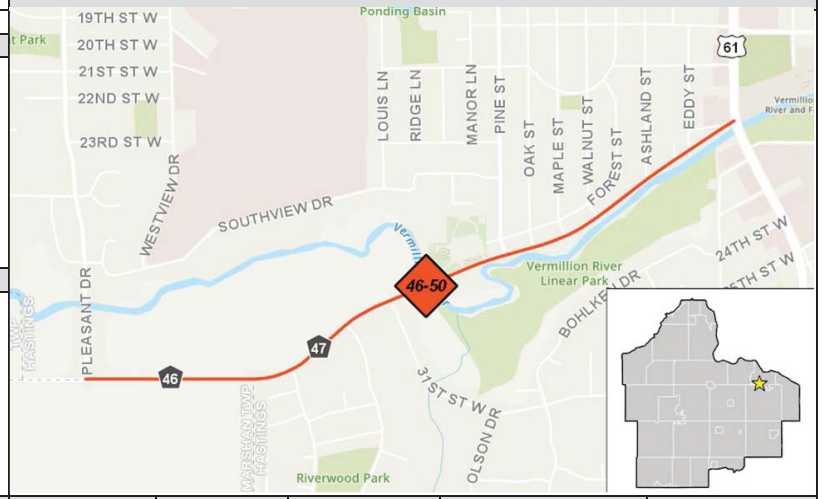
2022-2026 Capital Improvement Program

2022 CAPITAL BUDGET

and 2022 - 2026 TRANSPORTATION SALES & USE TAX CAPITAL IMPROVEMENT PROGRAM

Project Title:	CSAH 46 Reconstruction	
Project Number(s):	46-50	ST46050
Year of Board Authorization:	2022	**Project Description:**
Target Completion:	2024	Reconstruction of CSAH 46 from Pleasant Drive to TH 61 in Hastings. The project will include roundabouts at Pleasant Drive and Pine Street, bridge replacement over the Vermillion River, trail construction, and storm sewer.
Project Type:	Replacement & Modernization	
JL Key:	ST46050	
Project Location:		
CSAH 46 from Pleasant Drive to TH 61 (Vermillion St) in Hastings		

Project Graphic



Project and Fiscal History:

Project assumes federal funding to advance, which has not yet been received. Regional Solicitation funding will be applied for in 2022.

Project Revenues	Original Project Estimate	Approved Budget	2022 Budget	2023 Estimate	2024 Estimate	2025 Estimate	2026 Estimate	Beyond 2026	Total Revised Project Revenues Estimate	2022 Project Revenues Estimate Change
Local	-	-	123,000	345,000	249,000	-	-	-	717,000	717,000
Federal	-	-	-	-	6,640,000	-	-	-	6,640,000	6,640,000
Transportation Sales Tax	-	-	697,000	1,955,000	1,411,000	-	-	-	4,063,000	4,063,000
	-	-	820,000	2,300,000	8,300,000	-	-	-	11,420,000	11,420,000

Project Expenditures	Original Project Estimate	Approved Budget	2022 Budget	2023 Estimate	2024 Estimate	2025 Estimate	2026 Estimate	Beyond 2026	Total Revised Project Expenditures Estimate	2022 Project Expenditures Estimate Change
Land Acquisition	-	-	-	2,300,000	-	-	-	-	2,300,000	2,300,000
Consulting Services	-	-	820,000	-	-	-	-	-	820,000	820,000
New Construction	-	-	-	-	8,300,000	-	-	-	8,300,000	8,300,000
Total	-	-	820,000	2,300,000	8,300,000	-	-	-	11,420,000	11,420,000

ATTACHMENT J

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Hastings
MINNESOTA

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TRAILS

- ASPHALT
- CONCRETE
- OTHER
- MISSISSIPPI RIVER TRAIL (MRT)
- HASTINGS 10-MILE SCENIC CIRCUIT
- MRT CONNECTION

PARKS

1-Eagle Bluff Park
2-River Flats Park
3-Featherstone Park Ponding Basin
4-Lake Rebecca Park
5-Jaycee Park
6-Levee Park
7-Olivers Grove Park
8-Depot Park
9-Lake Isabel Park
10-Crestview Park
11-Public Square
12-Lions Park
13-Wilson Park
14-Roadside Park
15-Rivertown Dog Park
16-Conzemius Park
17-Tierney Park
18-Rosemary Park Ponding Basin
19-C.P. Adams Park
20-Southwest Park Ponding Basin
21-Pioneer Park
22-Wallin Park
23-Pleasant Park
24-Dakota Hills Park
25-Westwood Park
26-Con Agra Park
27-Old Mill Park
28-Vermillion Falls Park
29-Vermillion River Linear Park
30-Veterans Park Athletic Complex
31-Cannon Park
32-Riverwood Park
33-Greten Park
34-Cari Park
35-Sunny Acres Park
36-South Pines Park
37-Tuttle Park

FACILITIES

- PARKING
- SCHOOLS

CITY BUILDINGS

- AQUATIC CENTER
- CHAMBER OF COMMERCE
- CITY HALL
- CIVIC ARENA
- FIRE DEPARTMENT
- PARKS DEPARTMENT
- POLICE DEPARTMENT
- PUBLIC DOCK
- FISHING PIER
- BOAT LANDING

POINTS OF INTEREST

- A-SCENIC OVERLOOK
- B-RIVER DIKE TRAIL
- C-FEDERAL LOCK AND DAM #2
- D-SCENIC OVERLOOK
- E-HASTINGS BRIDGE PLAZA, RIVER OVERLOOK, & TRAILHEAD
- F-OFF LEASH DOG PARK
- G-LEDUC MANSION
- H-DISC GOLF COURSE
- I-VERMILLION RIVER FALLS
- J-WHITE WATER RAFTING
- K-VERMILLION RIVER GORGE BRIDGE
- L-OLD MILL RUINS

0 0.25 0.5 1 Mile

ATTACHMENT K

Vermillion River Greenway (Hastings)

MASTER PLAN

County Board Adopted—October 29, 2019

Dakota COUNTY

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Introduction

1

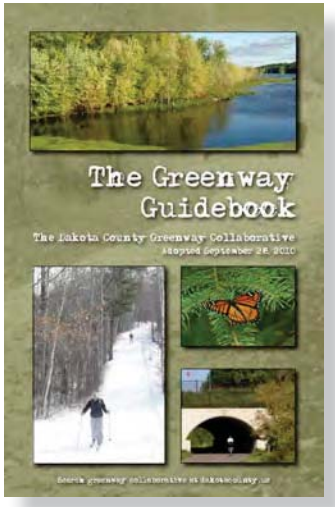
OVERVIEW

The Vermillion River Greenway (Hastings) is a proposed regional trail and open space corridor that will provide a link between southwestern Hastings neighborhoods, Vermillion Falls Park, the Mississippi River Greenway in eastern Dakota County, and the new Point Douglas Regional Trail connecting Hastings to Prescott, Wisconsin. Much of the greenway corridor has an existing City trail facility along it today. The regional greenway designation will provide improvements, such as natural resources restoration projects, trailhead and gateway facilities, and overlooks. The greenway will serve as a destination trail for the larger surrounding area and connect to the Dakota County Greenway network. The five-mile corridor stretches east and west within southern Hastings and then north to the Mississippi River and downtown Hastings. A one-mile portion of the trail corridor will be newly designed and constructed in southwestern Hastings connecting to Marshan Township. The greenway corridor's surrounding land use includes single-family residential, downtown business district, and public open space.

The Vermillion River Greenway Master Plan:

- Identifies the preferred trail and greenway alignment
- Envisions improvements to water quality, habitat, recreation, and non-motorized transportation along the corridor
- Provides strategies for interpretation, resource stewardship, development, land acquisition, and operations
- Estimates project costs
- Satisfies requirements for Metropolitan Council Thrive 2040 regional destination trail and greenway planning

The Vermillion River Greenway is circled in red on the map above.



Dakota County Greenway Vision

In the 2008 Dakota County Park System Plan and the 2010 Dakota County Greenway Guidebook, the County has established a vision for an interconnected system of open space corridors – greenways. Greenways provide many benefits but require little land.

Greenways can protect natural areas, habitat, stream corridors, and water quality. As green corridors landscaped with native plants, greenways offer a more natural experience than traditional roadside trails.

Greenways are a great way to "bring parks to people" in developed areas, where opportunities for large regional parks may no longer exist.

Dakota County Park System Plan

The 2008 Dakota County Park System Plan established the foundation for a county-wide greenway network by envisioning regional greenways that connect parks, schools, local trails, and libraries through the non-rural portions of the county.

Dakota County Greenway Collaborative: The Greenway Guidebook

In 2010, Dakota County adopted the Dakota County Greenway Guidebook, which guides the process for greenway planning and development. The guidebook establishes a framework for a collaborative approach to governance, stewardship, design, and operation of greenways.

Figure 4. Mississippi River Corridor Critical Area

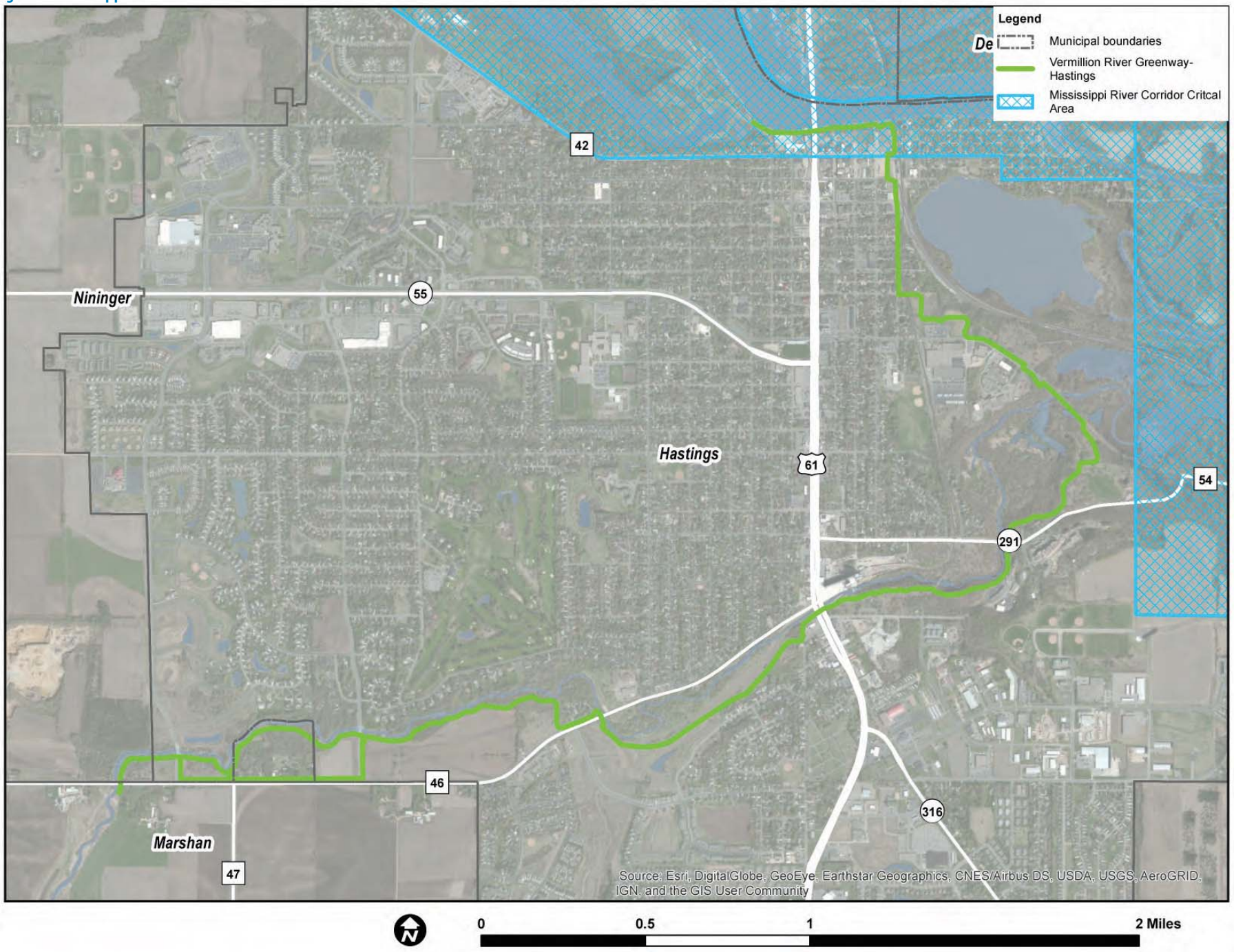
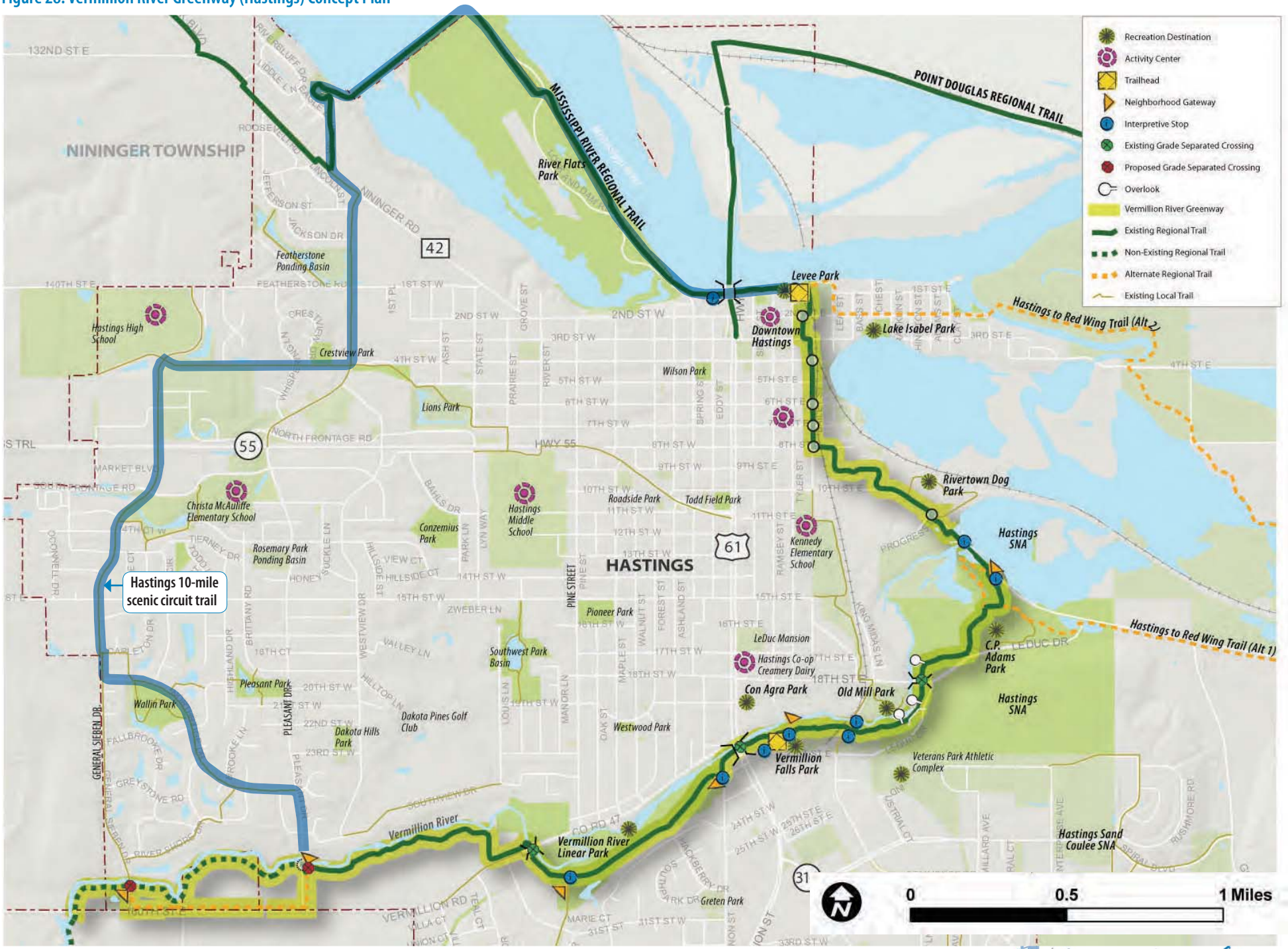


Figure 28. Vermillion River Greenway (Hastings) Concept Plan

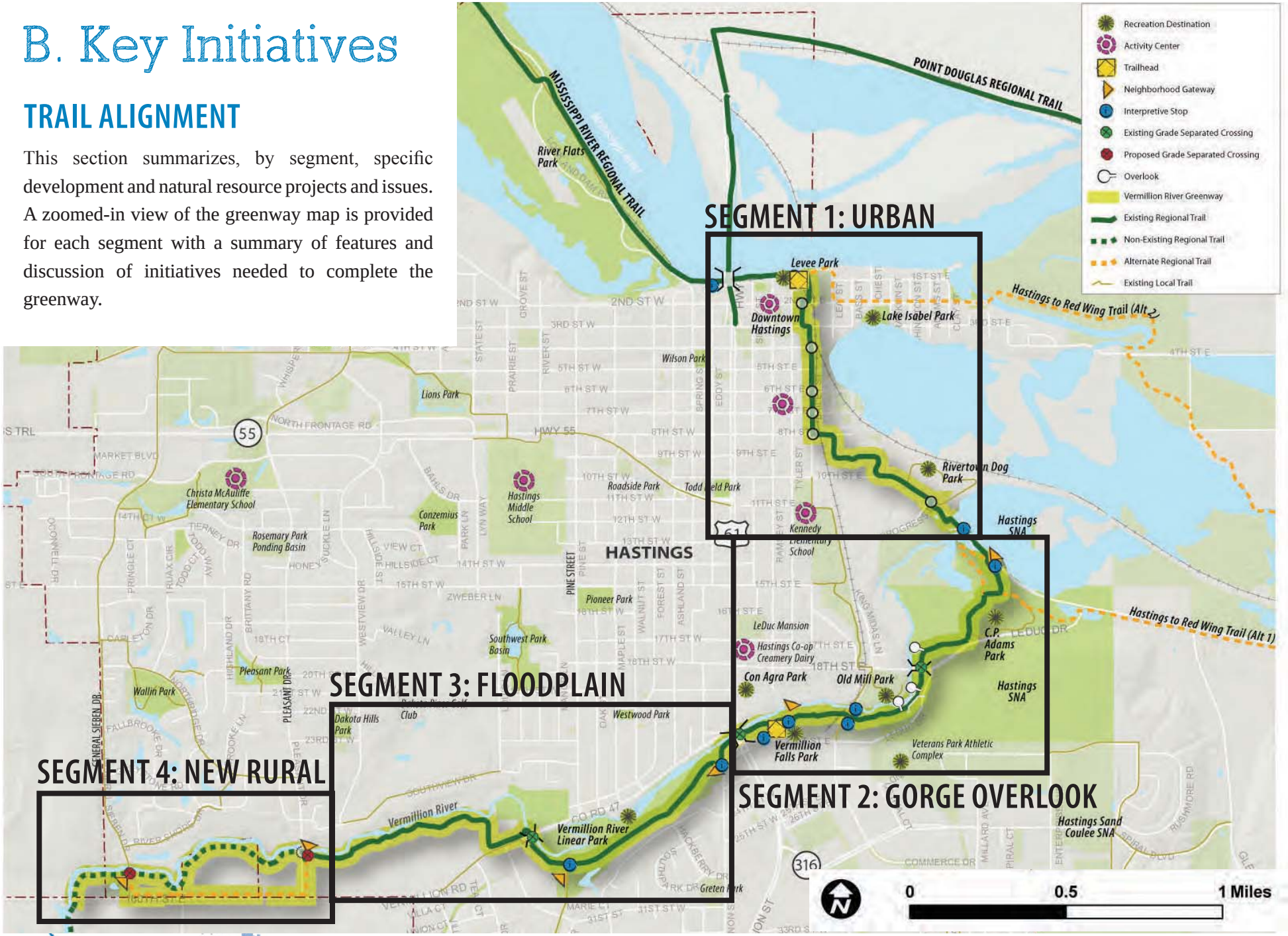


B. Key Initiatives

TRAIL ALIGNMENT

This section summarizes, by segment, specific development and natural resource projects and issues. A zoomed-in view of the greenway map is provided for each segment with a summary of features and discussion of initiatives needed to complete the greenway.

Figure 37. Vermillion River Greenway (Hastings) Segment Map



Segment 2: Gorge Overlook

(1.35 Miles; 0% parallel to road, 100% off-road)

Segment 2 of the Vermillion River Greenway follows the Vermillion River gorge from the falls to the outlet of the river at Ravenna Trail where it begins to pour into the Mississippi River. This segment offers dramatic views of the Vermillion River, opportunities to view ruins of the former mills, and a restored rail trestle bridge that serves as a trail connection to the north side of the river.

SEGMENT 2: GORGE OVERLOOK

Recreation Destinations
- C.P. Adams Park
- Old Mill Park
- Veterans Park Athletic Complex
- Vermillion Falls Park
- Con Agra Park

Activity Centers
- Kennedy Elementary School
- Hasting Co-op Creamery Dairy

Trailheads
- Vermillion Falls Park

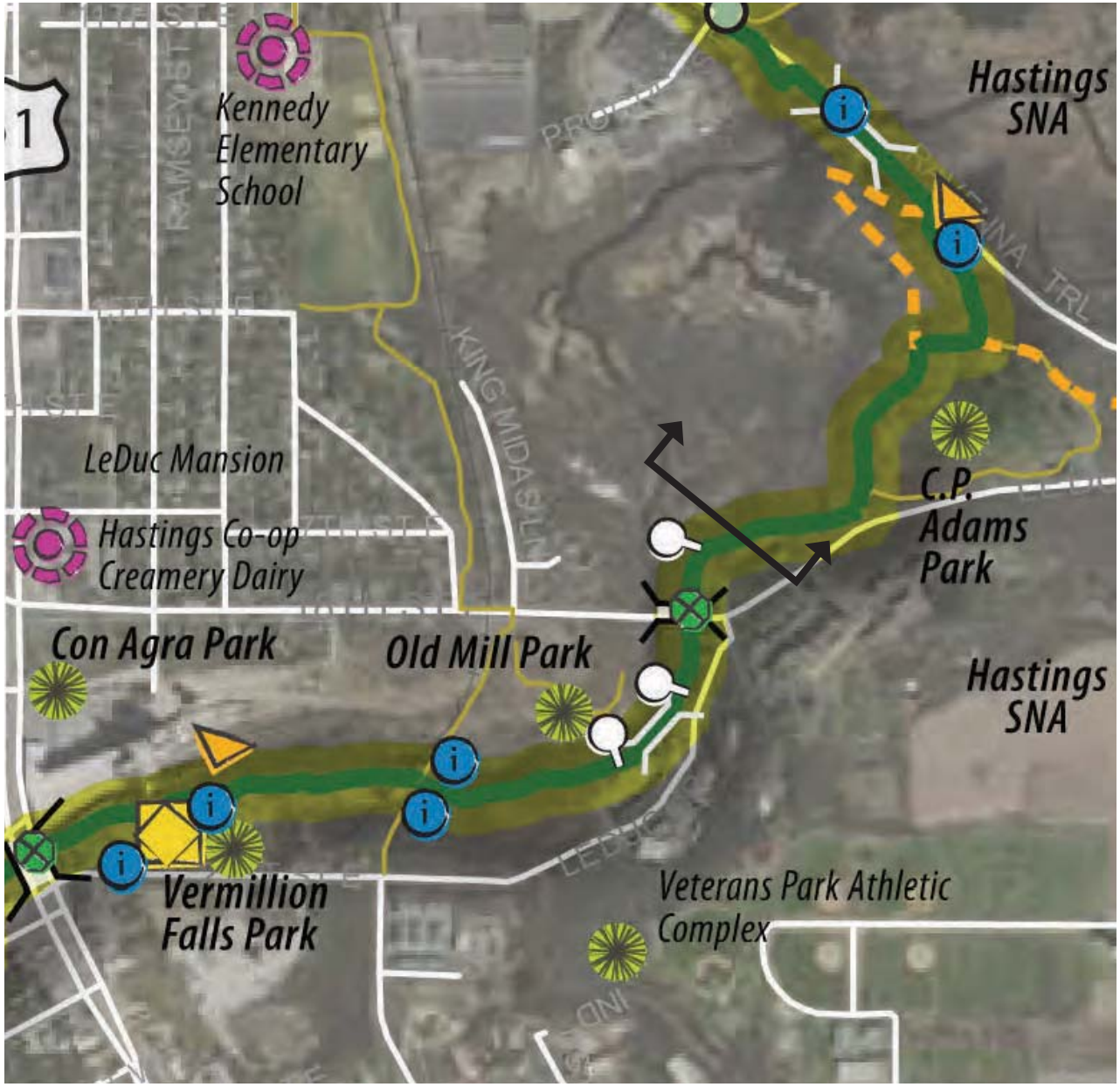
Neighborhood Gateways
- Ravenna Trail Entry
- Con Agra Park

Interpretive Stop
- Ravenna Trail
- Old Mill Park
- Vermillion Falls Park

Grade Separated Crossings
- 18th Street E
- Highway 61

Figure 40. Gorge Overlook Section

Figure 41. Vermillion River Greenway: Segment 2



Further design details will assess location and access of overlooks.

C.P. Adams Park / Alternative Alignment

From Ravenna Trail to the north side of the disc golf course in C.P. Adams Park, two paved trails exist to traverse the steep slope. Trail A is newer and wider than B, but A includes a sharp, hairpin turn in order to meet ADA slope requirements. Trail B has a more gentle curve but has a steeper grade. This plan identifies trail B as the preferred route for the regional greenway trail.

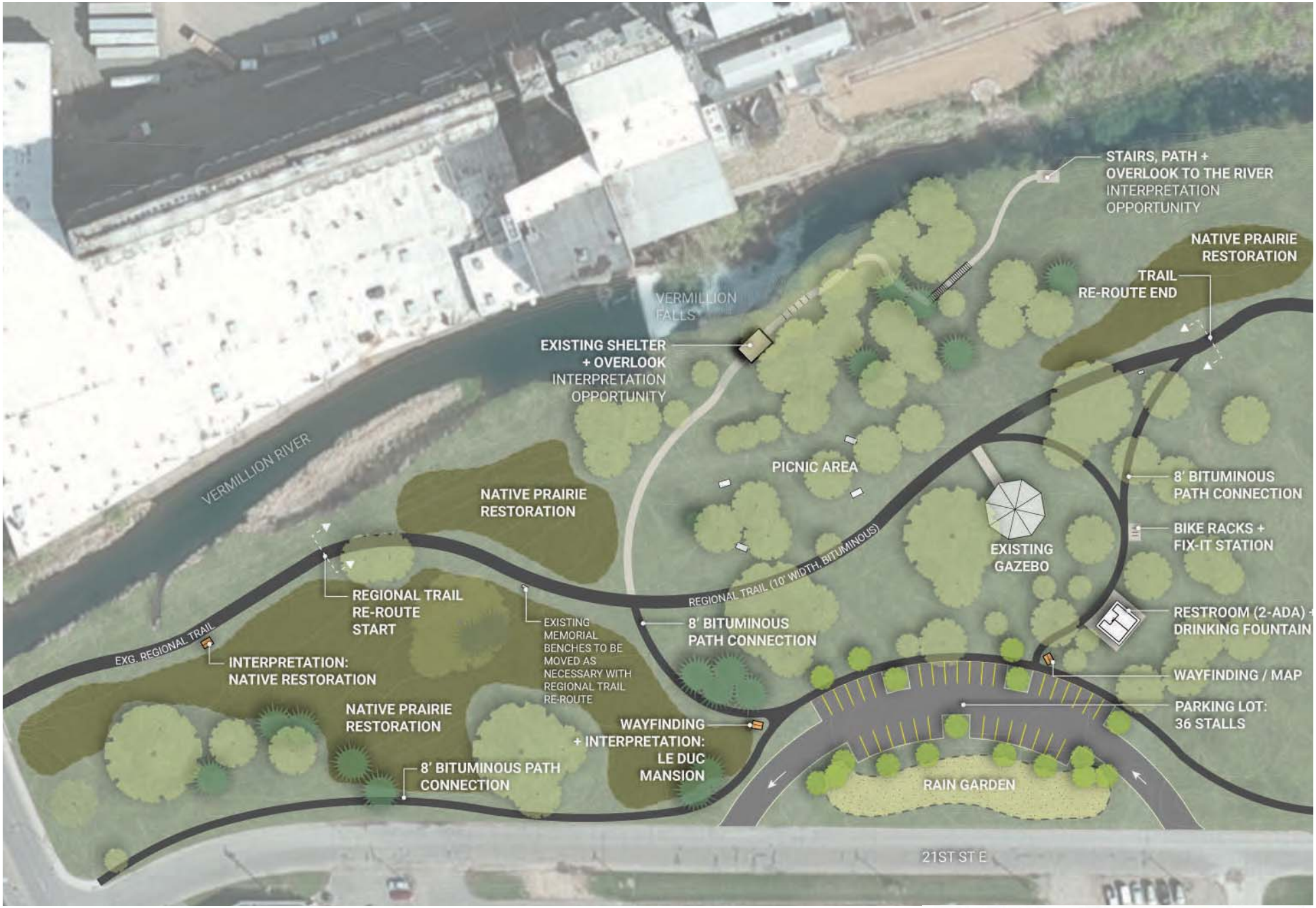
Figure 42. Alternative Alignment Options at C.P. Adams Park

Vermillion Falls Park

The trailhead concept at Vermillion Falls Park shows a re-designed parking lot with trail connections to a re-aligned Regional Trail. Trailhead amenities include a future ADA accessible restroom, bike racks, and areas with native prairie restoration. Wayfinding and interpretation are integrated into the park at key locations. An additional stair, path and overlook will connect trail and park users to the river.

Existing trail bridge over the Vermillion River and connecting the greenway trail to Old Mill Park

Figure 43. Trailhead at Vermillion Falls Park



Segment 3: Floodplain
(1.75 Miles; 6% parallel to road, 94% off-road)

Segment 3 of the Vermillion River Greenway starts at the Highway 61 underpass and leads west along the river and floodplain. The trail winds behind homes and along the levee that was constructed as a result of severe flooding in the 1960s. The experience on this segment allows some views of the river, but the trail winds away from the river and through prairie restoration areas.

The trail crosses under Co. Rd. 47 and continues to follow along the south side of the river up until Pleasant Drive where the trail ends and meets up with a local trail that crosses over the river on the Pleasant Drive bridge.

SEGMENT 3: FLOODPLAIN

Recreation Destinations
Vermillion River Linear Park

Neighborhood Gateways
Cannon Street / 22nd Street W
Bolkhen Drive
Pleasant Drive

Grade Separated Crossings
Vermillion Road/31st Street W

Interpretive Stop
Vermillion River Linear Park

Figure 44. Floodplain Restoration Section

Figure 45. Vermillion River Greenway: Segment 3

The trail will be reconstructed in its current location in order to stay out of the floodway.

Segment 4: New Rural Section
(0.9 Mile; 0% parallel to road, 100% off-road)

Segment 4 of the Vermillion River Greenway starts at the Neighborhood Gateway at Pleasant Drive.

The new trail segment begins at Pleasant Drive and will follow the south edge of the Vermillion River. This alignment has been identified on past City trail planning maps and in the City's comprehensive plan. If the trail were to follow the river, easements or property acquisition would be needed on several private properties that are adjacent to the river. This alignment would be in an entirely off-road corridor, which would provide a more natural experience for trail users.

An alternative alignment shows the trail travelling south to CR 46 where the trail will turn, crossing Pleasant Drive at-grade. The alternative alignment will continue along the north side of CR 46. At General Sieben Drive, the trail will turn north.

The remaining (long-term) future trail segment will cross General Sieben Drive with a grade-separated crossing and continue alongside the Vermillion River to Marshan Township, crossing under CR46 with another grade separated crossing.

Figure 46. Vermillion River Greenway: Segment 4
The trail will be located generally along the floodway boundary (where feasible outside of the floodway).

SEGMENT 4: NEW RURAL SECTION

Neighborhood Gateways
Pleasant Drive
General Sieben Drive

Grade Separated Crossings
Pleasant Drive
General Sieben Drive
CR 46 / 160th Street E

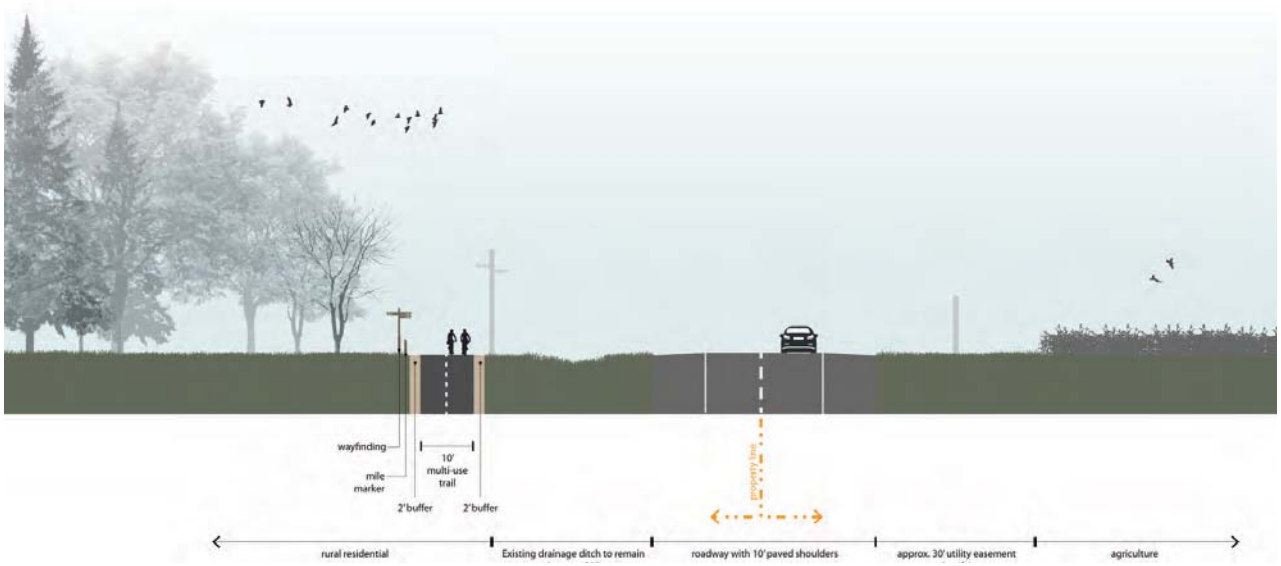


Figure 47. New Rural Section: Alternative Alignment

CSAH 46 Corridor Study
Summary and Recommendations

Study Purpose

Dakota County and the City of Hastings have completed a study of County State Aid Highway (CSAH 46) between the Vermillion River crossing west of General Sieben Drive and Minnesota Trunk Highway 61 (TH 61). The study evaluated safety, traffic, and access issues on the highway. Community members provided input at several in-person and online events. Together, this information was used to create a future vision for the highway.

Study Goals

- Improve traffic safety and mobility
- Evaluate and improve pedestrian and bicycle facilities
- Implement roadway and intersection improvements
- Improve natural resources
- Engage with the community along the corridor

Issues and Concerns

The following issues and concerns were identified, based on technical study and community input:

- Obstructed sight lines for drivers
- Speeding was noted as a concern. Also, the different speeds on the corridor make it hard for drivers to know when it is safe to pull out into traffic.
- The road is nearing its capacity for traffic
- Pedestrian and bicycle facilities are not continuous
- The Vermillion River bridge is nearing the end of its service life and does not have pedestrian and bicycle facilities
- Closely spaced intersections lead to congestion and safety issues
- Vehicles passing on the shoulders was noted as a concern in some locations

Improvement Needs

The study identified the following needs:

- Improve mobility and intersection safety
- Upgrade roadway capacity to accommodate future traffic growth
- Facilitate safe and efficient local access to and from CSAH 46
- Minimize impacts to natural resources
- Accommodate pedestrian and bicycle use
- Replace the aging bridge

Dakota County transportation we get you there

Study Recommendations

Initial Corridor Project

The project partners have defined an initial corridor improvement project between Pleasant Drive and Highway 61. Long term improvements along the western segment of the corridor between General Sieben Drive and Pleasant Drive will be addressed as future development and redevelopment occurs. The details of the initial project are described below and shown in the figure, with numbers in black boxes matching up the improvements described in the text and shown on the figure on page 6 of this document.

Roadway Section

Between Pleasant Drive and Highway 61, CSAH 46 is recommended to be reconstructed as a two-lane divided roadway with right and left turn lanes at select intersections. A raised center median in conjunction with the access management strategy described below is also proposed. Between Pine Street and Highway 61, the road would be narrower to minimize impacts to the Vermillion River and to private property *(map note #1)*.

Intersection Changes

PLEASANT DRIVE

A single-lane roundabout is recommended at the Pleasant Drive and CSAH 46 intersection. A roundabout in this location provides the greatest safety benefit compared to other options while also maintaining traffic flow. A roundabout will encourage slower speeds, facilitate crossings for pedestrians and bicyclists, and accommodate future growth if Pleasant Drive is expanded to the south *(map note #2)*.

PINE STREET

A single-lane roundabout is recommended at the Pine Street and CSAH 46 intersection. The roundabout is anticipated to reduce delay and backups, facilitate efficient access to and from the highway, address left-turn crashes, encourage slower speeds, and facilitate crossings for pedestrians and bicyclists. The roundabout also can be used for u-turns by traffic from nearby intersections or driveways that do not have left turn access onto CSAH 46 *(map note #3)*.

Access Management

When driveways and/or intersections are closely spaced, congestion and collision problems result from conflicts between traffic entering and exiting the road and through traffic. The more access points on a road, the more opportunities for such conflicts. Dakota County access spacing guidelines were developed to minimize the potential for safety issues while maximizing the efficiency of the road. For CSAH 46, the guidelines recommend one-quarter mile spacing between full movement intersections and one-eighth mile spacing between partial movement intersections. The locations below do not meet the County's spacing guidelines.

PLEASANT DRIVE TO VERMILLION RIVER BRIDGE

The intersections between Village Trail and 31st Street do not meet the spacing requirements. Recommendations include limiting Riverwood Drive to a right-in/right out intersection. A new senior living facility is planned along the north side of CSAH 46 at Riverwood Drive. The proposed corridor access changes include a right-in/right out intersection at the senior living facility. During final design of the highway, the County and City will consider additional access options for the facility *(map note #4)*.

Four private residences along the north side of CSAH 46 near the 31st Street intersection have driveway access directly onto CSAH 46. During final design, consolidating the four private driveways to one common access point opposite 31st Street is recommended. The driveway consolidation will improve mobility and safety for both driveway users and highway traffic *(map note #5)*.

VERMILLION RIVER BRIDGE TO HIGHWAY 61

Immediately east of Pine Street, the intersections of Oak, Maple, and Walnut Street are too closely spaced, as are the intersections of Ashland, Spring, Eddy, and 21st Street. Challenging sightlines and trouble finding gaps to make turns have been identified by the public as issues in this location. It is recommended to convert Maple Street, Oak Street, Walnut Street, Ashland Street and Spring Street to right-in/right-out intersections. A full access intersection is currently proposed at Eddy Street. The intersection of 21st Street and CSAH 46 is recommended to be closed. The County and City plan to use recommendations from the upcoming MnDOT Highway 61 study to inform final the design of CSAH 46 in the area west of Highway 61 *(map note #6)*.

Bicycle and Pedestrian Accommodations

GENERAL SIEBEN DRIVE TO PLEASANT DRIVE

The Dakota County Parks Department recently purchased property in the northeast corner of the General Sieben Drive and CSAH 46 intersection for a future Vermillion Greenway Trailhead facility. The project partners are recommending constructing a new off-road trail through the County property and connecting to a new roadside trail along the north side of CSAH 46 extending to Pleasant Drive. The trail segment will complete a connection between the trailhead facility, neighborhoods and parkland to the east *(map note #7)*.

PLEASANT DRIVE TO HIGHWAY 61

A trail is recommended on both sides of CSAH 46 between Pleasant Drive and Pine Street *(map note #8)*. A single trail is recommended along the north side of CSAH 46 between Pine Street and Highway 61 due to the close proximity to existing homes and the Vermillion River *(map note #9)*.The trails will connect the neighborhood to the adjacent Vermillion River Greenway, other natural resources in the area, and will provide connectivity along the corridor.

Vermillion River Bridge

The Vermillion River Bridge between 31st and Pine Streets was built in 1968 and is nearing the end of its service life. Because of its age, it is restricted in how much weight it can carry. The estimated remaining bridge life is 20 years. The shoulders on the bridge are too narrow to comfortably accommodate pedestrians and bicyclists. The bridge is recommended for replacement, with a new structure with a travel lane in each direction, eight-foot wide shoulders, and trails on both sides *(map note #10)*.

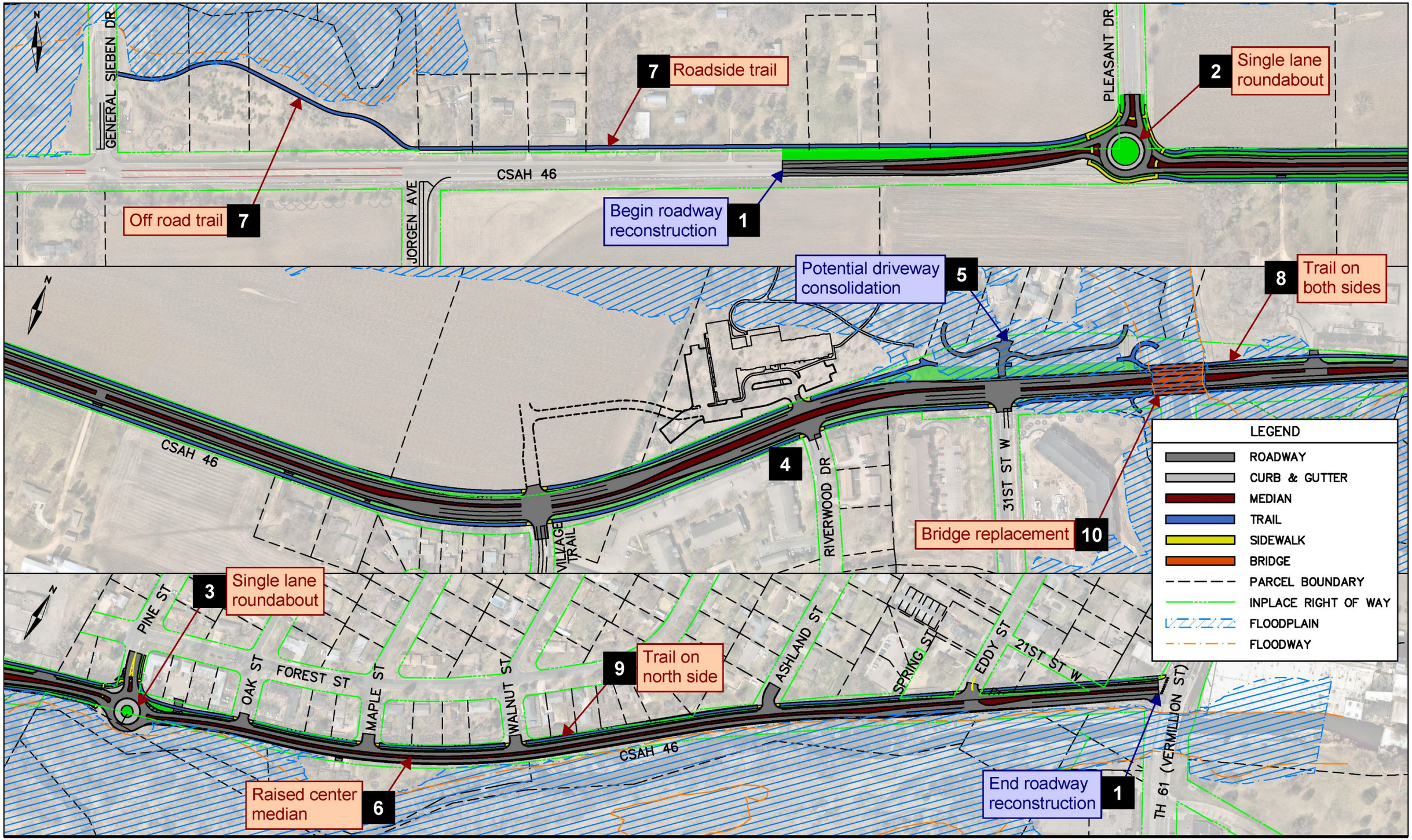
Spot Improvements

Outside funding opportunities will be pursued to offset project costs. If outside funding is not realized, smaller "spot" improvements could be made at certain locations to improve safety and mobility in more limited ways. These improvements would be intended for a short to mid-term implementation until a larger corridor project occurs. Potential spot improvements include:

- Constructing offset right turn lanes at General Sieben Drive and Jorgen Avenue
- Removing bypass lanes and constructing left turn lanes at Pleasant Drive and Pine Street
- Pavement marking and signing adjustments on side streets at General Sieben Drive, Jorgen Avenue, Pleasant Drive, and Pine Street

Next Steps

The estimated cost of the initial corridor project is about $15.3 million, with Dakota County's portion being about $13.0 million and the City of Hastings $2.3 million. Dakota County is also seeking outside funding such as the Metropolitan Council's Regional Solicitation and State Bonding requests. If these efforts are successful, the County and City cost shares would be less. The County is currently conducting preliminary engineering for the project, which will provide needed detail to support requests for outside funding.



CSAH 46 - General Sieben Drive to Highway 61
Recommended Improvements

ATTACHMENT M

Virtual Open House #1 (1/2021)

CSAH 46 Study in Hastings

EVENT SUMMARY

Comment Period
3 WEEKS
(1/4-1/22)

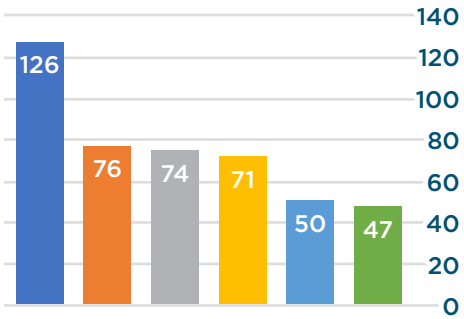
159
VIEWS

36
SURVEY RESPONDENTS

COMMUNITY PRIORITIES

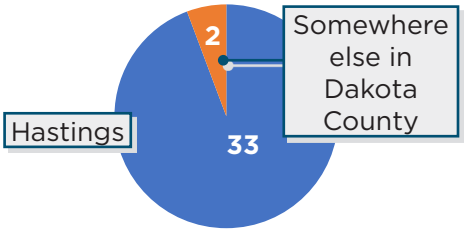
What is most important to you?

1. Improve Safety
2. Improve Traffic Flow
3. Support Walking/Biking
4. Reduce Speeds
5. Keep Costs Down
6. Protect River/Greenway



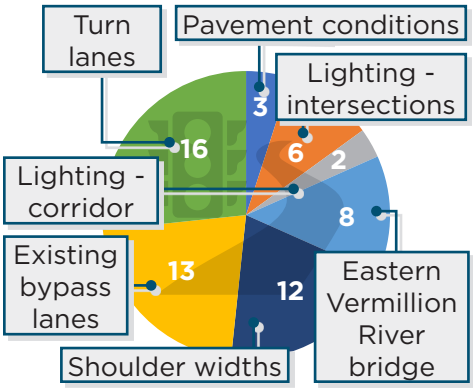
Respondent Residence

92% OF SURVEY RESPONDENTS LIVE IN HASTINGS



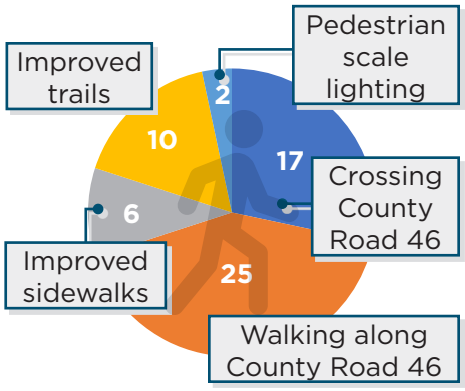
Infrastructure Concerns

Note: respondents could select multiple options



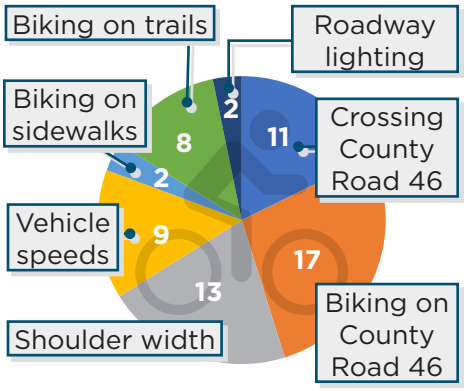
Pedestrian Concerns

Note: respondents could select multiple options



Bicyclist Concerns

Note: respondents could select multiple options



Do you have other improvement ideas or comments for the project team?

22 responses, themes that came up multiple times include:

- Pedestrian and bike connections
- Access management and traffic control
- Noise concerns
- Speed concerns
- Truck access
- Passing on shoulder
- Project purpose and funding

Dakota County transportation — we get you there

Since 1857 Hastings Minnesota

Find more information at www.dakotacounty.us and search *County 46 Study Hastings*

ATTACHMENT N

Open House #2 (8/2021-9/2021)

CSAH 46 Study in Hastings

EVENT SUMMARY

Online Comment Period
3 WEEKS
(8/13-9/7)

800
ONLINE PAGE VIEWS

In-Person Event
AUGUST 23
4:30-6:00 p.m.

AROUND
30
ATTENDEES

- Online content included an introductory video, summary of the purpose and work to date, and detailed information about corridor issues and potential improvements. A range of potential options for improving the roadway were available for download.
- At the in-person event, participants were given the opportunity to meet with the project team and ask questions about the potential options presented.
- Participants, both online and in-person, provided comments related to speeding, safety, bicycle, and pedestrian needs and changes to intersection controls such as roundabouts.

Missed the open house? View options here:
alliant.mysocialpinpoint.com/countyroad46study/open-house-2

In-Person Event

NEXT STEPS

Neighborhood Meeting (Pine Street to Highway 61)
Fall 2021

Selection of Recommended Alternatives
Fall 2021

Preliminary Design
Winter 2021/2022

Find more information at **www.dakotacounty.us** and search *County 46 Study Hastings*

Dakota COUNTY

Americans with Disabilities Act

Transition Plan

for County Highway Rights of Way

June 2018

Dakota COUNTY transportation
we get you there

Dakota County Draft Americans with Disabilities Act Transition Plan for County Highway Rights of Way

Table of Contents

Self-Evaluation

Overview

Dakota County, in accordance with Title II of the Americans with Disabilities Act (ADA) and 28 CFR 35.105, performed a self-evaluation of its current transportation infrastructure policies, practices, and programs. This self-evaluation identifies Dakota County Transportation Plan strategies and policies that have elements addressing accessibility. The purpose of the self-evaluation is to verify that, in implementing Dakota County's strategies, policies and practices, the Dakota County Transportation Department is providing accessibility and not adversely affecting the full participation of individuals with disabilities.

The self-evaluation also identifies barriers in the existing County highway infrastructure including sidewalks, curb ramps, bicycle/pedestrian trails and traffic control signals that are located within Dakota County rights of way. Any barriers to accessibility identified in the self-evaluation and the remedy to the identified barrier are set out in the practices and strategies of this plan.

Summary

In 2016, Dakota County conducted an inventory of pedestrian facilities and traffic signals within its public right of way. The inventory was conducted using the most current county Geographical Information System (GIS) data, latest aerial and street-level photography, and latest County Transportation Department database information. Locations that require a site visit based on recent roadway construction improvements or lack of current data is identified in the self-evaluation.

The inventory only includes existing transportation facilities. Non-existent facilities are not required to be identified or addressed under ADA Transition Plan guidelines. However, ADA stipulates that any project identified for construction or alteration that provides access to pedestrians must be made accessible to persons with disabilities.

The County will ensure that all new transportation facilities to be constructed will be ADA compliant. Future improvements or alterations to existing transportation facilities will also follow ADA guidance in meeting compliance. Details are identified under the Implementation Schedule section of this document.

The inventory included the following findings:

- Approximately **195 miles** of County highways that exists within County municipalities were surveyed. County highways located within rural townships were not surveyed because no pedestrian facilities exist on the County highways within the townships.

- Considering a pedestrian facility does or can exist on both sides of a highway, approximately **390 miles** of County highway right of way within municipalities is considered as available space for sidewalks or trails.
- The inventory includes **146 traffic** signals under County jurisdiction

Existing Sidewalks and Trails

- Approximately **191 miles**, or **49 percent** of County highway mileage within municipalities, **have concrete sidewalks or bituminous trails**. This is comprised of:
    - Approximately **52 miles**, or **13 percent** of County highway mileage within municipalities, with **concrete sidewalks**; and
    - Approximately **139 miles**, or **36 percent** of County highway mileage within municipalities, with **bituminous trail**.

Example of a good or compliant pedestrian ramp

Example of a poor or non-compliant pedestrian ramp

Pedestrian Ramps

- The inventory includes **3,165 pedestrian ramp locations** within the County highway right of way within municipalities.
- **2,376 pedestrian ramps**, or **75 percent**, appear substantially ADA compliant.
- **789 pedestrian ramps**, or **25 percent**, do not appear ADA compliant, require further evaluation or require installation.

Example of a good or compliant traffic signal

Example of a poor or non-compliant traffic signal

Traffic Signals

- The inventory includes **146 traffic signals** that the County is responsible for at county highway intersections.
- **25 traffic signals**, or **17 percent**, are ADA compliant with Accessible Pedestrian Signals.

A detailed evaluation of these facilities is found in the appendices.

Appendix B – Self-Evaluation Results

Approximately 195 miles of County highways were surveyed. The surveyed mileage exists within County municipalities. County highways located within rural townships were not surveyed. Considering a pedestrian facility does or can exist on both sides of a highway, approximately 390 miles of County highway right of way is considered as available space for sidewalks or trails.

This initial self-evaluation of pedestrian facilities yielded the following results:

- 68% of areas that required concrete sidewalk were in place and appeared to meet accessibility criteria.
- 75% of areas that required curb ramps were in place and appeared to meet accessibility criteria.
- 15% of intersections did not have any compliant curb ramps (with truncated domes).
- 45% of areas that require bituminous trails were in place and appeared to meet accessibility criteria.
- 17% of traffic control signals had Accessible Pedestrian Signal systems.

Pedestrian Infrastructure Inventory

In 2016, Dakota County inventoried pedestrian ramps, sidewalks and trails within the county highway rights of way along county roadways. The County also identified which traffic signals on the county highway system have been constructed with Accessible Pedestrian Signals.

Pedestrian Ramps
All pedestrian ramps within county highway rights of way were identified as one of four categories or cases as follows:

Case 1
The pedestrian ramp has a truncated dome and has been checked for compliance.

Case 2
The pedestrian ramp has a truncated dome and has not been checked for compliance. However, the ramp appears substantially compliant from observation.

Case 3
The pedestrian ramp does not have a truncated dome. However, the pedestrian ramp does not appear to present a significant physical barrier for pedestrians.

Case 4
The pedestrian ramp is in need of construction, installation or modification based on the condition of the pedestrian ramp, or lack thereof, and its location relative to existing pedestrian facilities.

The inventory also identified locations where no pedestrian facilities existed.

Results

The results of the pedestrian ramp inventory completed within county highway rights of way were:

Case 1	=	0 ramps (no ramps were physically reviewed for compliance check)
Case 2	=	2,376 ramps
Cases 3 & 4	=	789 ramps (Cases 3 & 4 were combined as construction costs to obtain compliance are the same for each category)

Pedestrian ramps that have been categorized as Case 3 or 4 scenarios will be identified as candidates for future projects. The timeline for construction, installation or modification of each of these pedestrian ramps will depend on its correlation to planned projects, and available funding.

A pedestrian ramp inventory was conducted for each County highway within a municipality. This inventory includes:

- The intersecting street or driveway location of the pedestrian ramp
- The case number and compliance results
- If the intersection is signalized
- Specific site notes
- Municipality

This inventory is located in Appendix G.

Sidewalks and Trails

All sidewalks and trails within county highway rights of way were inventoried and evaluated to determine existing lengths, adjacent land uses and to identify general condition.

The following categories were used to rate the condition of concrete sidewalks and bituminous trails:

Good

A facility that has recently been constructed, reconstructed or resurfaced and has no or few defects.

Fair

A facility that has a few defects, may require future maintenance, but remains fairly functional to pedestrians.

Poor

A facility that has numerous defects and/or requires maintenance to be safely functional for pedestrians. If a facility does not exist it was categorized as poor in the inventory.

Facility defects and obstructions were considered in rating the facility. These included defects or damage that could cause pedestrians to fall, that could impede wheelchair users or disabled pedestrians and common defects such as breaks, unevenness and projecting or settling sections. The defects and obstructions considered included the following:

- Pavement “heave” between sections or at the curb or street connection
- Uneven sloping
- Horizontal or vertical cracking
- Drainage issues consisting of low points that hold water or runoff
- Vegetation issues consisting of substantial vegetation growing within the pavement or adjacent to the pavement
- Significant ware or lack of maintenance

- Slope issues near streets, driveways or hills
- Obstructions such as fire hydrants, lighting poles, signal poles, utility poles, and utility hand holes.

Results

Results of the inventory are:

- 51.7 miles of good and fair sidewalks
- 139.2 miles of good and fair trails
- 2.9 miles of poor sidewalks
- 8.1 miles of poor trails
- 21.6 miles of missing sidewalk segment locations
- 165.0 miles of missing trail segment locations

Sidewalks and trails rated as poor will be identified as candidates for future projects. The timeline for construction, installation or modification of each of these sidewalks and trails will depend on its correlation to planned projects, and available funding.

The sidewalk and trail inventory conducted for each County highway within a municipality includes:

- The facility segment by intersection
- The type of facility
- Adjacent land use
- Segment length
- Segment rating
- Specific segment notes
- Municipality

This inventory is located in Appendix G.

Accessible Pedestrian Signals (APS)

All traffic signals within county highway rights of way were inventoried within the municipalities. There are 146 traffic signals on the county highways within the municipalities.

The *Dakota County 2030 Transportation Plan* provides guidance for the placement and operation of traffic control devices within the county (pages 7-23 through 7-27). This includes strategies and policies for intersection traffic control studies; city or state maintenance assistance for traffic control signals; transit priority for traffic control signals; traffic control signal operations, maintenance, and energy costs; traffic signal coordination; and intersection traffic control changes.

The County designs and installs new signals or signal replacements to be compliant with ADA. Accessible Pedestrian Signals (APS) are considered part of the design practice for new signals. The Minnesota Manual on Uniform Traffic Control Devices (MMUTCD) identifies an APS as a device that communicates information about pedestrian timing in nonvisual format such as audible tones, speech messages, and/or vibrating surfaces. Anywhere pedestrians would be permitted to cross APS is provided with new or replacement signals.

The APS or pedestrian push buttons installed or maintained are based upon the design standard at the time of installation. All new locations are designed to meet current standards. The County has installed a few APS systems based on assessment and requests. However, when retrofitting these devices, the devices are installed on existing poles and would not necessarily be designed the same as a newly designed system. The County designs all new signals with the ADA standards including APS and pedestrian ramps to meet requirements to the degree possible. Dakota County uses MnDOT standard design information that

includes information from the Public Right of Way Accessibility Guidelines (PROWAG).

CSAH 42 (Nininger Rd - Hastings): Sidewalk Inventory

From	To	East/North	Land Use	Good/F Length	Poor Length	West/South	Land Use	Good/F Length	Poor Length	Rating (G/F/P)	Notes	City
west city boundary	Monroe St	none	R		0.066	trail	R	0.066		good		Hastings
Monroe St	Madison St	none	R		0.210	trail	R	0.210		good		Hastings
Madison St	Pleasant Dr	trail	U	0.169		trail	R	0.169		good		Hastings
Pleasant Dr	private access	none	U		0.110	sidewalk	U	0.110		fair		Hastings
private access	private access	none	U		0.100	sidewalk	C	0.100		fair		Hastings
private access	private access	none	U		0.102	sidewalk	C	0.102		fair		Hastings
private access	1st St W	none	U		0.131	sidewalk	U	0.131		fair		Hastings
1st St W	Lakeside Cemetery	none	U		0.032	sidewalk	R	0.032		fair		Hastings
Lakeside Cemetery	Grove St	sidewalk	R	0.098		sidewalk	R	0.098		fair		Hastings
Grove St	2nd St W	sidewalk	R	0.019		sidewalk	R	0.019		fair	(a)	Hastings
2nd St W	River St	sidewalk	R	0.053		sidewalk	R	0.053		fair	(a)	Hastings
River St	Pine St	sidewalk	R	0.112		none	R		0.112	fair	(a)	Hastings
Pine St	north private drive	sidewalk	U	0.242		none	R		0.242	fair		Hastings
north private drive	Ashland St	sidewalk	R	0.064		sidewalk	R	0.064		fair	(a)	Hastings
Ashland St	Spring St	sidewalk	R	0.055		sidewalk	R	0.055		fair		Hastings
Spring St	Eddy St	sidewalk	R	0.055		sidewalk	C	0.055		fair		Hastings
Eddy St	Vermillion St	sidewalk	C	0.042		sidewalk	C	0.042		fair		Hastings
	TOTAL			**0.909**	**0.751**			**1.306**	**0.354**		**Total Area**	**3.320**

Shaded areas represent priority locations, areas of missing infrastructure and/or areas to address

Notes

(a) driveways

Land Use

R	Residential (house, apartment)
C	Commercial (business, industrial)
I	Institutional (school, church, park, athletic complex)
U	Undeveloped (open space, utilities, transportation)

CSAH 42 (Nininger Rd - Hastings): Pedestrian Ramp Inventory

CSAH 42	Curb Ramp Information						Location
At	Complies	To Comply	Notes	Case	Signal	Notes	City
Monroe St	2	0		2			Hastings
Madison St	3	0		2			Hastings
Pleasant Dr	4	0		2			Hastings
private access	2	0		2			Hastings
private access	2	0		2			Hastings
private access	2	0		2			Hastings
1st St W	2	0		2			Hastings
Lakeside Cemetery	0	0		6			Hastings
Grove St	2	0		2			Hastings
2nd St W	2	0		2			Hastings
River St	3	0		2			Hastings
Pine St	2	0		2			Hastings
north private drive	0	0		6			Hastings
Ashland St	2	0		2			Hastings
Spring St	4	0		2			Hastings
Eddy St	2	0		2			Hastings
Vermillion St	4	0		2			Hastings
TOTAL	**38**	**0**					

Shaded areas represent priority locations, areas of missing infrastructure and/or areas to address

Curb Ramp Case Ratings

1 Ramps with truncated domes that have been checked for compliance
2 Ramps that appear substantially compliant
3 Ramps without truncated domes
4 Ramps in need of construction installation or modification
5 Trail exists on one side of road. Trail is at grade & does not require ramps.
6 No pedestrian facilities exist.

Regional Bicycle Network

metrocouncil.maps.arcgis.com/apps/webappviewer/index.html?id=0b0735b3407f49ceb347fc30c9b83bda

Regional Bicycle Network

Link to RBTN study

Find address or place

ATTACHMENT P

- RBTN Tier 1 Alignments
- RBTN Tier 1 Corridor Centerlines
- RBTN Tier 1 Corridors
- RBTN Tier 2 Alignments
- RBTN Tier 2 Corridor Centerlines
- RBTN Tier 2 Corridors
- Destinations
  - Job Centers
  - Sports Ent Complex
  - Hi Visit Reg Parks
  - Higher Ed >2K
  - Major High Schools
- Regional Bikeways Inventory
  - Existing
  - Planned
  - Programmed
- Regional Trails
  - Existing (Open to Public)
  - Existing (Not Open to Public)
  - Planned
  - Alternate

Mississippi River

Dakota

Washington

Hastings

Prescott

Lake Isabelle

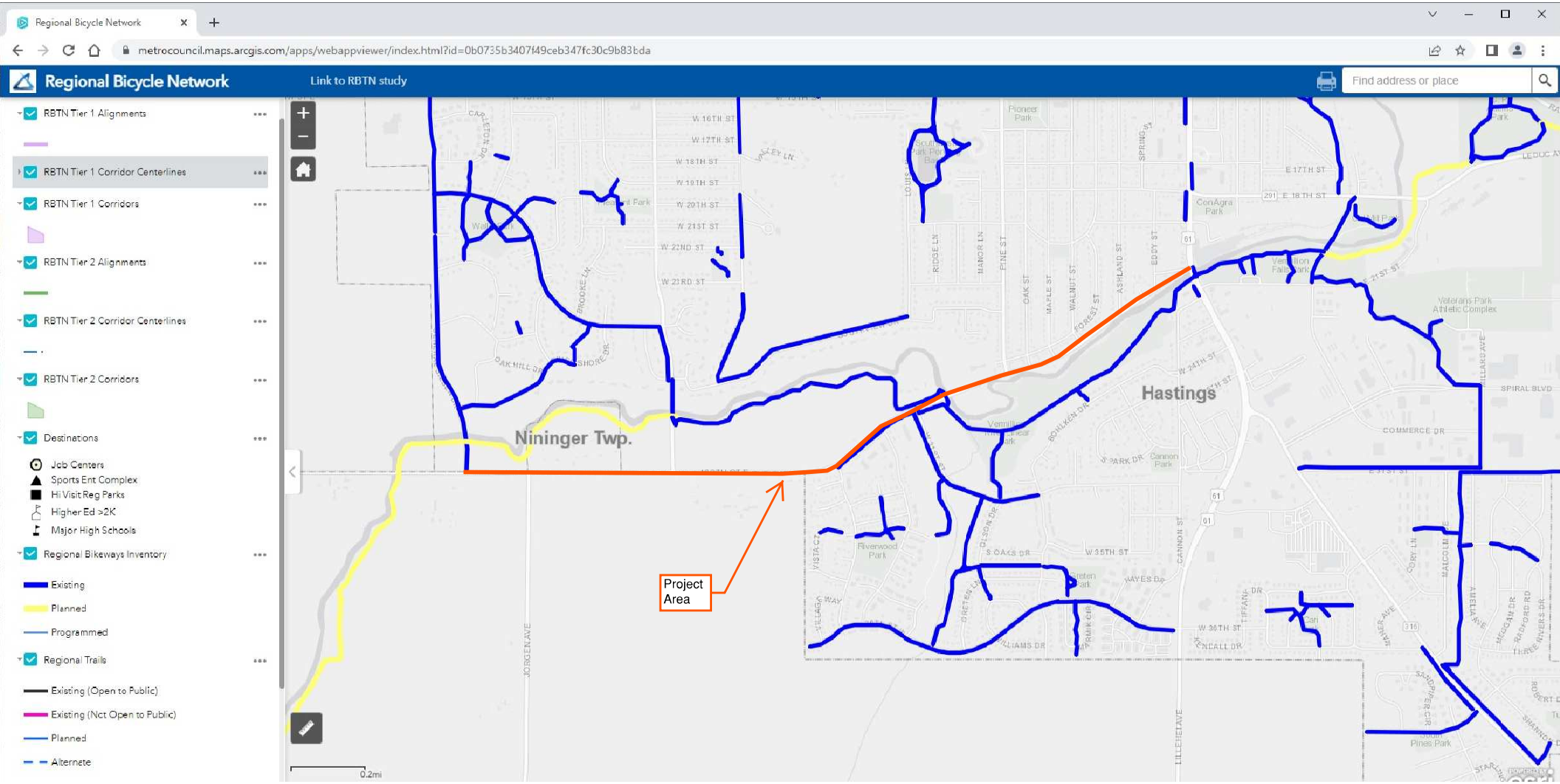
Project Area

1mi

-92.944 44.805 Degrees

County of Dakota, Washington County, MN, Esri, HERE, Garmin, G...

esri


Regional Bicycle Network
metrocouncil.maps.arcgis.com/apps/webappviewer/index.html?id=0b0735b3407f49ceb347fc30c9b83bda
Regional Bicycle Network
Link to RBTN study
Find address or place
RBTN Tier 1 Alignments
RBTN Tier 1 Corridor Centerlines
RBTN Tier 1 Corridors
RBTN Tier 2 Alignments
RBTN Tier 2 Corridor Centerlines
RBTN Tier 2 Corridors
Destinations
Job Centers
Sports Ent Complex
Hi Visit Reg Parks
Higher Ed >2K
Major High Schools
Regional Bikeways Inventory
Existing
Planned
Programmed
Regional Trails
Existing (Open to Public)
Existing (Not Open to Public)
Planned
Alternate
Nininger Twp.
Hastings
Project Area
0.2mi

CSAH 46 Modernization Project

Dakota County 2022 Regional Solicitation Reconstruction/Modernization Application Attachment listing

Attachment A – Project Summary

Attachment B – Existing Conditions Photographs

Attachment C – Project Layout

Attachment D – Identified ROW Parcels

Attachment E – Met Council Maps (4 total)

Attachment F – Letters of Support (2 total)

Attachment G – Met Council Thrive MSP Plan Goal Sheets

Attachment H – Dakota County 2040 Transportation Plan Goals Sheets

Attachment I – Dakota County CIP sheet

Attachment J – City of Hastings Park Map

Attachment K – Vermillion River Greenway Excerpts

Attachment L – Adopted CSAH 46 Study Recommendations

Attachment M – CSAH 46 Open House 1 Summary Sheet

Attachment N – CSAH 46 Open House 2 Summary Sheet

Attachment O – County's ADA Transition Plan Excerpts and Inventory Sheets

Attachment P – RBTN Screenshots of Project Area

BOARD OF COUNTY COMMISSIONERS
DAKOTA COUNTY, MINNESOTA

April 5, 2022 — Resolution No. 22-144

Motion by Commissioner Hamann-Roland — Second by Commissioner Atkins

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Approval Of Grant Application Submittals For 2022 Regional Federal Funding Solicitation And Rebuilding American Infrastructure With Sustainability And Equity Grant Program

WHEREAS, the Transportation Advisory Board (TAB) is requesting project submittals for federal funding under the Fixing America's Surface Transportation (FAST) Act; and

WHEREAS, the U.S. Department of Transportation is requesting project submittals for Rebuilding American Infrastructure with Sustainability and Equity (RAISE) grant program; and

WHEREAS, the FAST federal programs fund up to 80 percent of project construction costs; and

WHEREAS, the RAISE federal grant program in rural areas funds up to 100 percent of project costs and 80 percent of project costs in urban areas; and

WHEREAS, federal funding of projects reduces the burden, local taxpayers, for regional improvements; and

WHEREAS, project submittals are due on April 14, 2022; and

WHEREAS, all projects proposed are consistent with the adopted Dakota County Comprehensive Plan; and

WHEREAS, subject to federal funding award, the Dakota County Board of Commissioners would be asked to consider authorization to execute a grant agreement at a future meeting.

NOW, THEREFORE, BE IT RESOLVED, That the Dakota County Board of Commissioners hereby approves the following County led projects for submittal to TAB for federal funding:

1) County State Aid Highway (CSAH) 46 (160th Street/Brandel Drive) from Trunk Highway (TH) 3 to TH 52 in Coates, Empire Township and Rosemount
2) CSAH 46 (160th Street) from 1,300 feet west of General Sieben Drive to Highway 61 in Hastings
3) CSAH 42 (150th Street) from Redwood Drive to 147th Street in Apple Valley
4) CSAH 26 (Lone Oak Road) from TH 13 to Interstate 35E in Eagan
5) CSAH 46 (160th Street) at CSAH 85 (Goodwin Avenue) in Nininger and Vermillion Townships
6) CSAH 60 (185th Street) from CSAH 50 (Kenwood Trail) to Ipava Avenue in Lakeville
7) CSAH 63 (Delaware Avenue) Trail from TH 62 to Marie Avenue in Mendota Heights and West St. Paul – Safe Routes To School

STATE OF MINNESOTA
County of Dakota

	YES		NO
Slavik	X	**Slavik**	
Gaylord	X	**Gaylord**	
Halverson	X	**Halverson**	
Atkins	X	**Atkins**	
Workman	Absent	**Workman**	
Holberg	X	**Holberg**	
Hamann-Roland	X	**Hamann-Roland**	

I, Jeni Reynolds, Clerk to the Board of the County of Dakota, State of Minnesota, do hereby certify that I have compared the foregoing copy of a resolution with the original minutes of the proceedings of the Board of County Commissioners, Dakota County, Minnesota, at their session held on the 5th day of April 2022, now on file in the County Administration Department, and have found the same to be a true and correct copy thereof.

Witness my hand and official seal of Dakota County this 5th day of April 2022.

Jeni Reynolds

Clerk to the Board

8) CSAH 63 (Delaware Avenue) Trail from Marie Avenue to TH 149 (Dodd Road) in Mendota Heights and West St. Paul
9) Minnesota River Greenway – Railroad Overpass in Eagan
10) River to River Greenway from TH 149 trail and TH 149 underpass in Mendota Heights
11) Mendota to Lebanon Hills Greenway - TH 149 South in Mendota Heights
12) Veterans Memorial Greenway from TH 3 to CSAH 32 (Cliff Road) in Eagan and Inver Grove Heights
13) CSAH 23 (Cedar Avenue) pedestrian overpass at 140th Street in Apple Valley
14) CSAH 42 Trail and Underpass from 145th Street to Dakota County Technical College in Rosemount

; and

BE IT FURTHER RESOLVED, That the Dakota County Board of Commissioners hereby supports the following city led submittals to TAB for federal funding:

1) Nicollet Avenue and TH 13 interchange in Burnsville
2) CSAH 23 (Cedar Avenue) pedestrian overpass at 147th Street in Apple Valley – Transit Modernization
3) CSAH 9 (Dodd Boulevard) Trail from 210th Street to CSAH 50 (Kenwood Trail) in Lakeville
4) CSAH 73 (Babcock Trail) Trail from Upper 55th St. to I-494 in Inver Grove Heights
5) Lake Marion Greenway from Sunset Park to Rose Bluffs in Burnsville
6) Lake Marion Greenway from Ritter Farm to downtown in Lakeville
7) North Creek Greenway from 199th St. W to Rambling River Park in Farmington

; and

BE IT FURTHER RESOLVED, That the Dakota County Board of Commissioners hereby approves the following County led project for submittal to U.S. Department of Transportation for the RAISE grant program:

1) County State Aid Highway (CSAH) 46 (160th Street/Brandel Drive) from Trunk Highway (TH) 3 to TH 52 in Coates, Empire Township, and Rosemount
2) Mississippi River Greenway Trail, Rosemount east segment

; and

BE IT FURTHER RESOLVED, That the Dakota County Board of Commissioners hereby supports the following city led submittal to U.S. Department of Transportation for the RAISE grant program:

1) TH 13 and Nicollet Avenue grade-separated intersection in Burnsville

; and

BE IT FURTHER RESOLVED, That, subject to federal funding award of the city-led projects, the Dakota County Board of Commissioners will provide the local match for regional greenway projects and for non-greenway projects will provide Dakota County's share of the matching funds consistent with Dakota County transportation cost-share policies.

STATE OF MINNESOTA
County of Dakota

	YES		NO
Slavik	X	**Slavik**	
Gaylord	X	**Gaylord**	
Halverson	X	**Halverson**	
Atkins	X	**Atkins**	
Workman	Absent	**Workman**	
Holberg	X	**Holberg**	
Hamann-Roland	X	**Hamann-Roland**	

I, Jeni Reynolds, Clerk to the Board of the County of Dakota, State of Minnesota, do hereby certify that I have compared the foregoing copy of a resolution with the original minutes of the proceedings of the Board of County Commissioners, Dakota County, Minnesota, at their session held on the 5th day of April 2022, now on file in the County Administration Department, and have found the same to be a true and correct copy thereof.

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Clerk to the Board