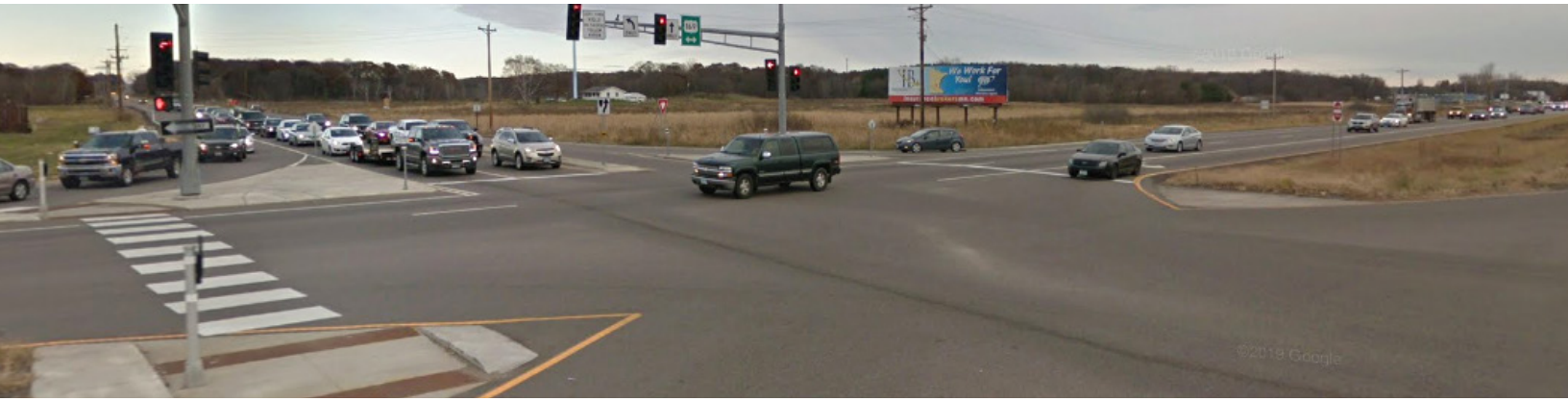
U.S. Highway 169/CR 4
Rural Safety and Mobility Interchange Project

Submitted by Sherburne County, Minnesota

2021 Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Program



Project Name **U.S. 169/CR 4 Rural Safety and Mobility Interchange**

Total Project Cost : $44,052,938

2021 RAISE Funds Requested **$25,000,000**

Contact Information:

Andrew J. Witter, P.E.,

Sherburne County Public Works Director / County Engineer

13880 Business Center Drive NW, Suite 100, Elk River, MN 55330-4668

(763) 765-3302

Andrew.Witter@co.sherburne.mn.us

Supporting Information can be found at:

https://www.srfconsulting.com/sherburne-raise/

SHERBURNE COUNTY

TABLE OF CONTENTS

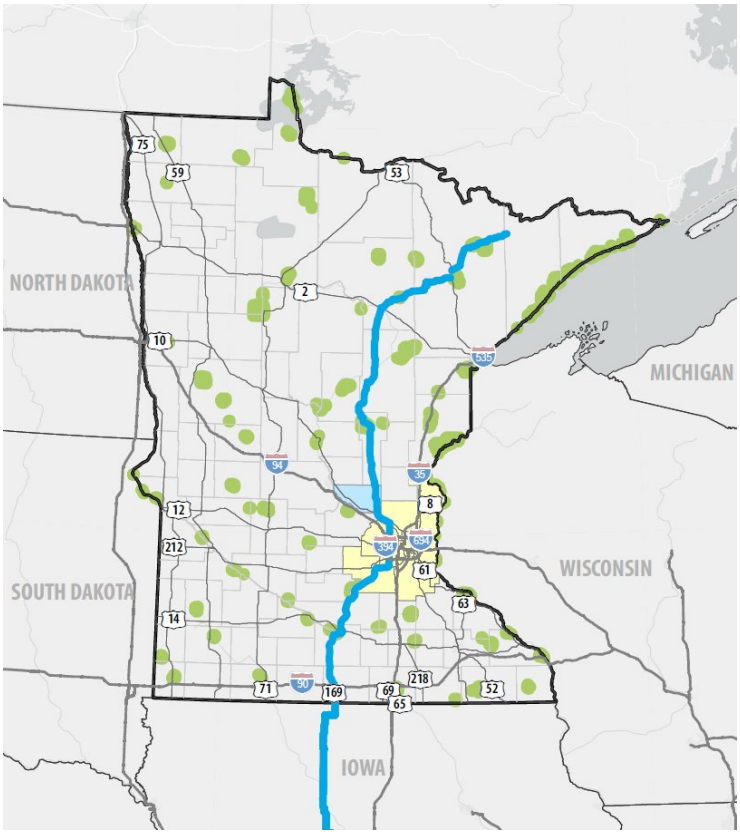
TABLE OF FIGURES

TABLE OF TABLES

PROJECT DESCRIPTION

The US 169 Rural Safety and Mobility Interchange Project will reconstruct approximately one mile of US Highway 169, an existing Principal Arterial roadway, from a rural four-lane undivided highway to a four-lane divided expressway and construct a grade-separated interchange at County Road (CR) 4. This project, previously submitted as a 2020 BUILD grant, will improve racial equity of the rural roadway system by reconstructing the roadway, adding critical safety and capacity improvements to address high crash rates at the intersection, and reconfiguring intersections to address unsafe conditions and improve access to the Mille Lacs Band of Ojibwe Tribal Land. **These improvements will vastly improve freight efficiency, improve rural safety, and strengthen rural access to economic opportunities.**

Figure 1. Project Location in Regional Context

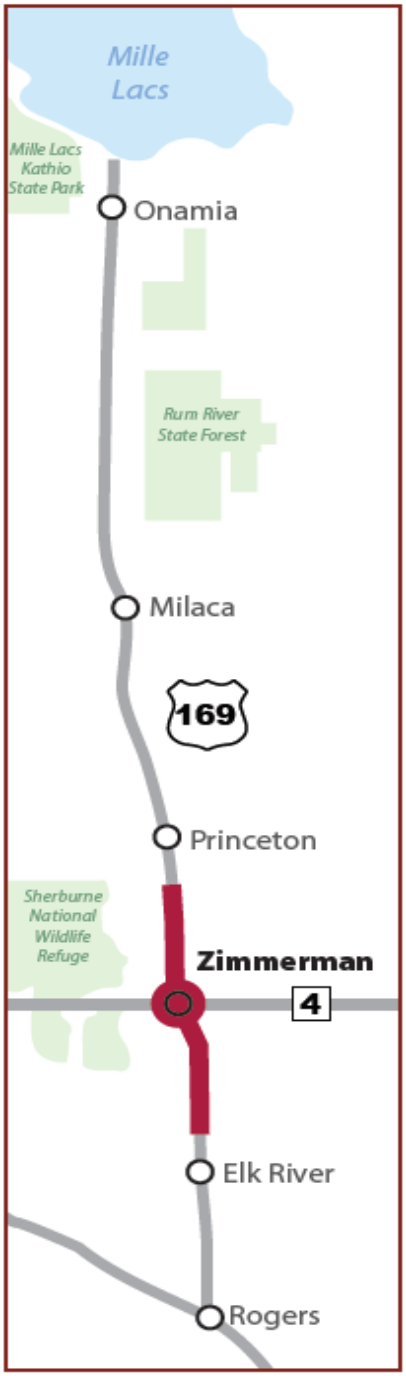


US 169 is identified by MnDOT as a Critical Rural Freight Corridor in the Minnesota Statewide Freight System and Investment Plan and is designated as a Tier 2 Truck Corridor in the Regional Truck Highway Corridor Study. The roadway is also on the designated National Highway System (NHS) and is designated as part of Minnesota's Interregional Corridor System. Interregional Corridors are intended to provide safe, timely and efficient movement of goods and people and provide connections between and among regional trade centers. In central Minnesota, US 169 is a vital north-south arterial route and serves an important role in supporting commuters, freight movement, and recreational travel. Central Minnesota has limited interstate access to the Twin Cities. This large area and its freight intensive construction, retail and manufacturing businesses rely on US 169 to provide interstate commerce connectivity from rural areas to the multi-state economic hub of the Twin Cities. Travel from 82 of the 87 counties in Minnesota pass through the US 169/CR4 intersection on an annual basis. On average, travelers from 56 of the 87 counties in MN pass through the intersection daily.[1] The roadway has 3,500 heavy commercial annual average daily traffic (HCAADT) and moves large amounts of freight from and through Minnesota, North Dakota, and beyond. This project will improve freight mobility and connectivity for freight haulers who utilize the roadway, most dramatically for the ten freight generators located immediately adjacent to the project area. Current congestion issues and varying travel time reliability along US 169 have direct economic impacts on rural Minnesotans, limiting their ability to reach jobs and education with a reliable commute schedule, reducing the travelshed for possible employment opportunities, and increasing commuting costs through inefficient gas use during congestion and vehicle damage due to poor pavement condition. Additionally, the higher-than-average crash rates along the roadway further worsen the disproportionate amount of injuries and deaths along rural roadways.

[1] Based on 2019 StreetLight Data.

US 169 is a vital connection for freight transportation, commuters and recreational travelers.

Figure 2. Project Location in Regional Context



Reconstruction of US 169 will directly benefit rural Minnesotans, freight haulers, local and regional businesses, the surrounding environment, commuters, statewide recreational tourism, and the local economy. Reconfiguring the roadway will relieve congestion and reduce idling, creating a cost savings for commuters and freight vehicles, reducing negative impacts on the environment, and improving travel time reliability. As freight is less likely to be damaged due to poor pavement, drivers will have more reliable delivery schedules, and vehicles will experience improved safety at intersections, the efficiency and use of US 169 by regional businesses will increase.

PROPOSED IMPROVEMENTS

PEDESTRIAN & BICYCLE CONNECTIVITY: Conversion to an interchange would create opportunity to **connect existing and proposed trails**, greatly improving access to parks and other scenic and natural amenities throughout the county.

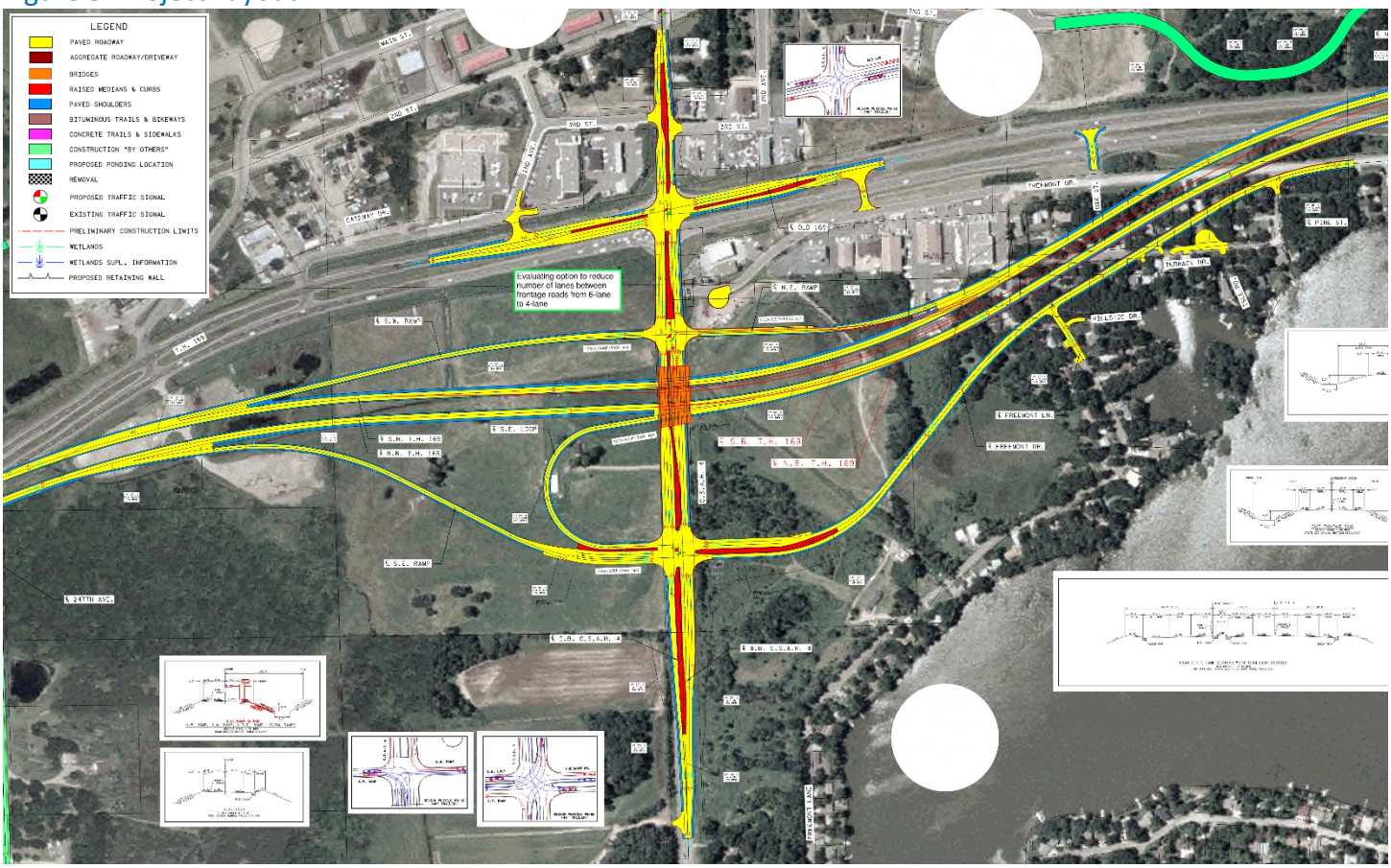
The existing project corridor is a four-lane divided rural roadway with narrow lanes, narrow shoulders, limited turn lanes, limited frontage and backage road systems, and multiple unsafe at-grade intersections. The existing facility, with limited pavement width, creates conflicts between rural farm equipment and regional truck traffic and generates traffic merge issues at the intersection of County Road 4. The current traffic signal control at US 169/CR 4 is also ranked second worst in safety within Central Minnesota (MnDOT District 3) and is the last remaining traffic signal on the 75-mile stretch of US 169 between Rogers and Lake Mille Lacs (shown in **Figure 2**). These inadequacies often create bottlenecks in the interstate freight supply chain and perpetuate safety issues, causing mile-long backups during peak travel times, leading to truck travel time delay and reliability uncertainty.

The US 169 Rural Safety and Mobility Interchange Project will reconstruct approximately one mile of US Highway 169 from a rural four-lane undivided highway to a four-lane divided expressway and construct a hybrid diamond interchange at CR 4. The proposed project will focus on safety and operational improvements that will improve reliability, accommodate planned long-term growth, improve bicycle and pedestrian connectivity, and connect rural communities in the Greater Central Minnesota Region

SIGNAL-FREE TRAFFIC CORRIDOR: Converting the intersection to an interchange would **eliminate the last remaining traffic signal** on the 75-mile stretch of Hwy 169 between Rogers and Lake Mille Lacs.

to economic opportunities in the Twin Cities Metropolitan Area. The project will minimize right-of-way impacts to residences along US 169 and impacts to wetland resourcs. The interchange includes a tight ramp configuration west of US 169 and a loop in the southeast quadrant of the interchange. The proposed CR 4 bridge over US 169 includes a multimodal trail facility along the north side of CR 4 that improves pedestrian and bicyclist safety by constructing a dedicated trail facility crossing over US 169. **Figure 3** illustrates the proposed project layout.

Figure 3. Project Layout



PROJECT HISTORY

MnDOT and local communities have committed to several programmed improvements in the corridor that will operate in concert with the proposed improvements at CR 4. The importance of US 169 in the statewide transportation system has been identified in several regional transportation studies including the MnDOT Statewide Interregional Corridor (IRC) Study and the Highway 169 Elk River to Zimmerman Study. In 2002, MnDOT completed the Highway 101/169 Corridor Management Plan from Rogers to Garrison. According to this plan, by 2030 the US 169 corridor will no longer meet performance targets established for interregional corridors unless improvements are made to the roadway.

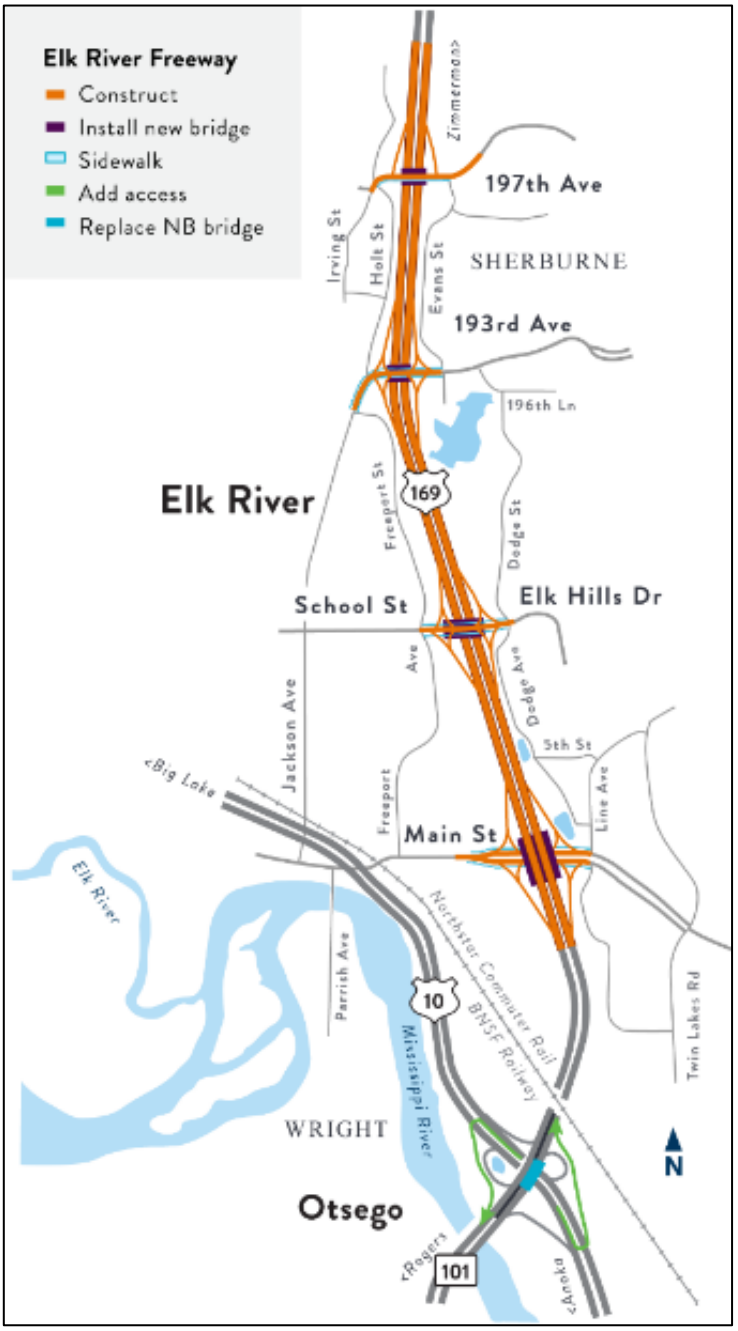
In 2010, an Environmental Assessment/Environmental Assessment Worksheet (EA/EAW) was completed for the US 169 Corridor from Elk River to Zimmerman. This study identifies the long-term access management plan for this segment of US 169 and has allowed for local units of government to concurrently plan for future land uses and transportation uses (vehicle and non-vehicular) adjacent to the corridor. The study also identified design concepts that continue to inform local transportation network planning and design.

In early 2020, MnDOT, the City of Elk River, and Sherburne County began contract administration and preliminary design for the *169 Redefine Project*. This project will reconstruct three miles of US 169 between Highway 101/10 and 197th Avenue in the City of Elk River, Sherburne County, to a new freeway system. Construction is anticipated to begin in fall of 2022. **Figure 4** illustrates planned improvements in the US 169 Corridor. Proposed work includes:

TRAFFIC DELAYS: Mile-long backups are common during peak travel times. Drivers often wait through multiple signal cycles before making it through the intersection.

- Reconstructing all four-lanes of Highway 169 and adjacent road connections
- Constructing four new interchanges at:
    - Highway 169 bridge over Main
    - School Street/Elk Hills Drive bridge over Highway 169
    - Jackson Avenue/193rd Avenue Street bridge over Highway 169
    - Highway 169 bridge over 197th Avenue
- Improving pedestrian accessibility along city streets
- Upgrading underground infrastructure and utilities
- Improving access at the Highway 169/Highway 101/Highway 10 interchange
- Replacing the northbound Highway 169/Highway 101 bridge over Highway 10

Figure 4. US 169 Redesign

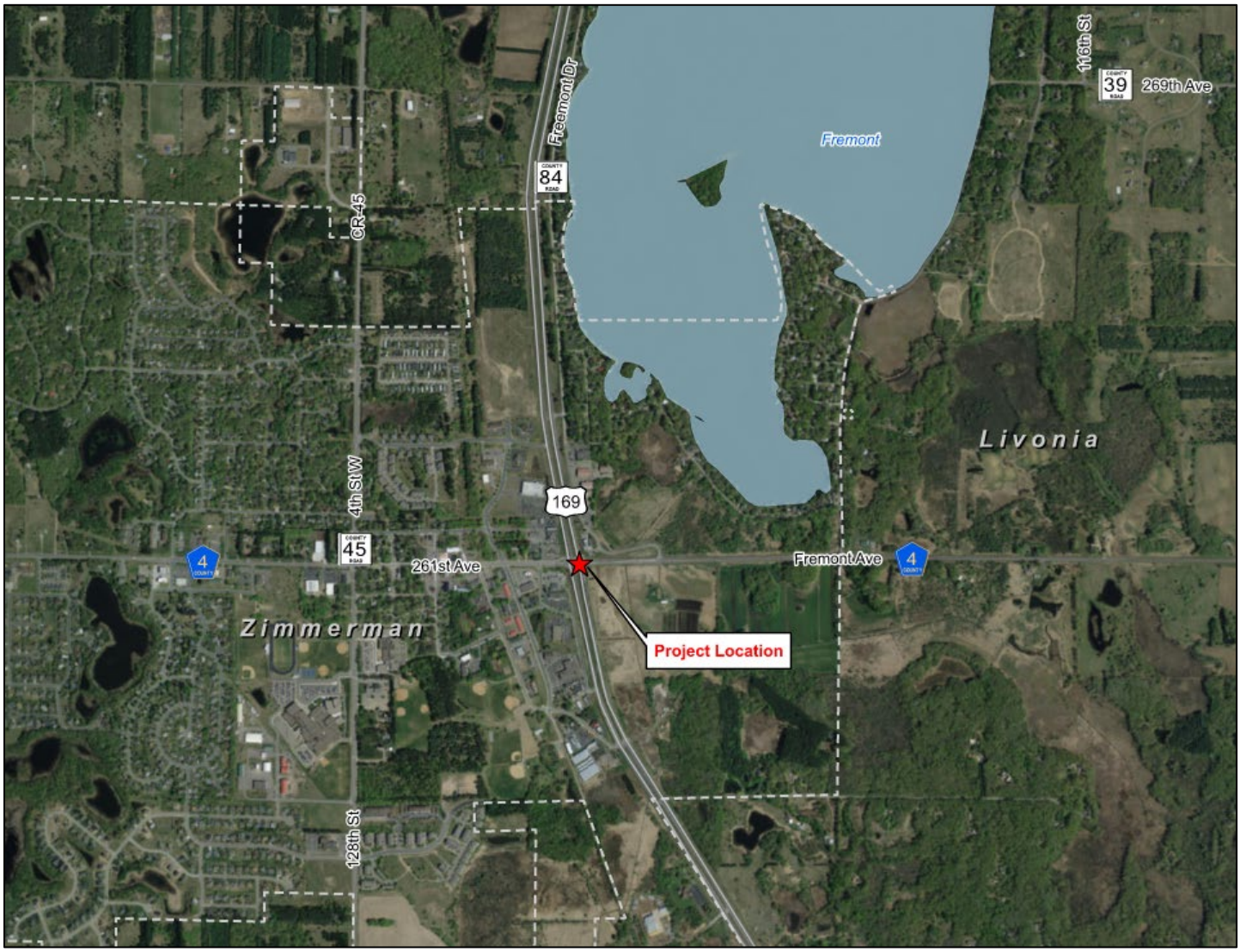


US 169 plays an important role in equitably serving commuters, connecting tribal and economic centers in the state, and serving recreational users. Converting US 169 to a freeway facility will provide a more safe and reliable connection between key economic and recreational destinations. When the *169 Redefine Project* is completed in 2024, it will improve system linkages along this important north-south arterial route in central Minnesota. This route connects Minnesota's rural central lakes region with the greater Twin Cities metropolitan area and the growing trade centers of Elk River, Zimmerman, and Princeton.

PROJECT LOCATION

US 169 is an important regional and national corridor that extends 966 miles from Oklahoma to Minnesota, connecting regional traffic from urban Twin Cities and rural Central Minnesota to the rest of the Great Plains. The Project is located approximately 15 miles north of the Minneapolis – St. Paul (Twin Cities) Urbanized Area and is designated as a Rural Area. The Project is located at the intersection of US 169 and CR 4 in the City of Zimmerman in Sherburne County, Minnesota. **Figure 5** depicts the project location.

Figure 5. Project Location



The entire project corridor is located in a rural area, outside of designated urbanized areas. The Project intersects communities whose economies depend upon tourism, manufacturing, retail, and agricultural industries. US 169 provides an essential connection between the Twin Cities metropolitan area and rural central Minnesota, including several regional trade centers between the Elk River, Brainard Lakes, and Grand Rapids areas. The proposed safety and capacity improvements will strengthen the rural transportation infrastructure to reduce rural fatalities and facilitate the efficient movement of goods and people.

Surrounding land uses are characterized by agricultural, rural residential, and highway commercial uses. The intersection provides direct access to commercial development along Main Street in downtown Zimmerman. According to the *City of Zimmerman Comprehensive Plan*, vacant land west of US 169 is planned for highway commercial use. A business park is planned in Livonia Township in the northwest quadrant of the intersection. Access and mobility issues with the US 169 have been identified by property owners as an obstacle to future development. It is likely that industrial land uses will continue to locate near the corridor, further increasing freight use of US 169. Reconstruction of this segment of roadway is key to ensuring freight shippers and receivers have a safe and efficient connection between rural and urban markets. **Table 1** provides population data on the communities within the Project Area. **Figure 6** illustrates the nearby urban and rural communities.

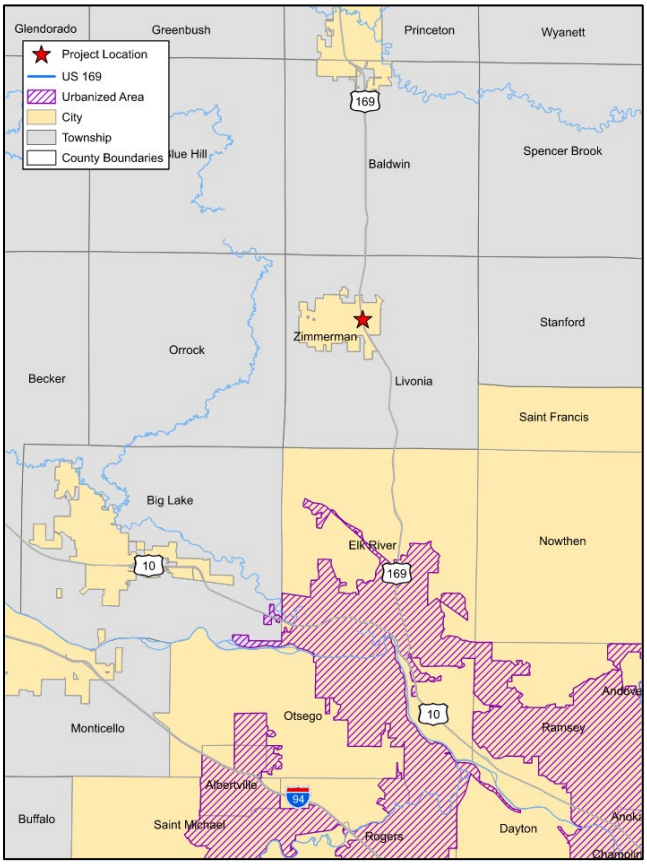
HIGHWAY HURDLE: All the traffic freed up by the *Hwy 169 Redefine* project in Elk River may have to stop at the traffic signal in Zimmerman.

Table 1. Project Area Population

Measure	Minnesota	Sherburne County	City of Zimmerman	Census Tract 030101
Population	5,563,378	94,463	5,657	12,130
Zero-Vehicle Households	6.7%	3%	1.3%	0.8%
Individuals Below Poverty Status	9.7%	6.4%	N/A	5.2%
Senior Population	15.4%	10.9%	11.0%	8.2%
Individuals with a Disability	10.8%	9.1%	N/A	9.9%

Source: American Community Survey, 2018

Figure 6. Census Urbanized Area and Rural Communities



GRANT FUNDS, SOURCES AND USES OF ALL PROJECT FUNDING

PROJECT BUDGET

Total Project Cost: $44,052,938 | **RAISE Grant Request Amount: $25,000,000**

AVAILABILITY AND COMMITMENT OF FUNDING SOURCES: This funding request will fulfil the critical funding gap to construct the project. All funding identified below is available and is formally committed to this project (see documentation including Sherburne County Resolution, City of Zimmerman resolution, and MnDOT Letter of Support. **Figure 7** presents the project budget. Detailed construction costs estimates are available at the grant application website.

Figure 7. Project Funding

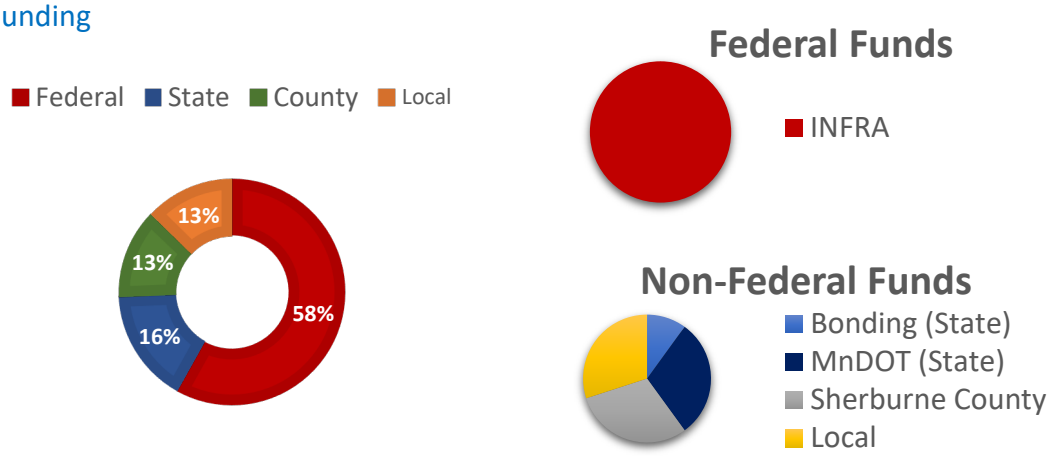


Table 2. Project Funding

Project Element	Project Funding: Non-Federal Dollars	Non-Federal Project Percentage	INFRA Dollars	INFRA Project Percentage	Other Federal Dollars	Other Federal Project Percentage	Total Cost Estimate
Preliminary Design/ Environmental Assessment	$200,000	20%	$0	0%	$800,000	80%	$1,000,000
Traffic Study	$10,000	100%	$0	0%	$0	0%	$10,000
Total Incurred Expenses	**$210,000**	**21%**	**$0**	**0%**	**$0**	**0%**	**$1,010,000**
Design Engineering/Construction Administration	$7,748,588	100%	$0	0%	$0	0%	$7,748,588
Right-of-Way	$4,300,000	100%	$0	0%	$0	0%	$4,300,000
Construction	$0	0%	$21,674,350	100%	$0	0%	$21,674,350
Misc. (mobilization, traffic control, minor items)	$3,826,915	18%	$3,325,650	15%	$0		$7,152,565
Contingency (10%)	$2,167,435	100%	$0	0%	$0	0%	$2,167,435
Total Future Costs	**$18,042,938**	**42%**	**$25,000,000**	**58%**	**$0**	**0%**	**$43,042,938**

Federal Participation (Maximum 80/20)				
Non-Federal	$18,042,938	42%	**Total Project Costs**	$44,052,938
INFRA Request	$25,000,000	58%		
Total Federal Funding	$25,000,000	58%		
Total Future Project Cost	$43,042,938			

NON-FEDERAL FUNDING SOURCES

Sherburne County Funding

Sherburne County has served as the champion of the Project and is committed to provide up to ten percent of the future project cost. The Sherburne County Board of Commissioners adopted a resolution to approve the request for RAISE grant funding and to commit to provide the local match for the Project. Local funding from Sherburne County is specifically dedicated to the Project through a new non-federal revenue source passed by Sherburne County in 2018. The Sherburne County Board of Commissioners adopted a special half-cent, county-wide sales tax to fund transportation projects. This tax revenue will generate approximately $3.2 million per year, for specific high-priority projects, including the US 169/CR 4 interchange.

STATE FUNDING

Sherburne County is closely coordinating with MnDOT on several State funding opportunities. The County has received $2 million in state bonding committments to support project construction activities. MnDOT has committed to providing $7 million in non-federal funding to support the project. Pursuant to the MnDOT Cost Participation and Maintenance with Local Governments Policy, the Project may be eligible for MnDOT Trunk Highway funds. The Trunk Highway Fund supports construction and maintenance projects on the trunk highway system. Additionally, MnDOT has programmed funding for spot improvements and preservation (pavement rehabilitation) for the maintenance of US 169. If the County is successful in securing RAISE grant funding, portions of this MnDOT programmed dollars may be reallocated towards the Project.

Additionally, MnDOT is committed to providing State funding for this highway project, which is under their jurisdiction. Since the roadway is a US Highway, future ongoing maintenance and operations of the new facility will be managed by MnDOT. Section V, Criterion #4 provides additional details about MnDOT's operation and maintenance project commitment.

OTHER FEDERAL FUNDING SOURCES

The City of Zimmerman received $800,000 in High Priority Projects (HPP) funds in 2005 as part of SAFETEA-LU for this Project. The HPP Program provided funding for 5,091 projects identified in SAFETEA-LU.

RAISE FUNDING NEED

Sherburne County, in partnership with MnDOT and local communities, has secured more than $1 Million in non-federal and other Federal funding to invest in the Project. MnDOT and local agencies have successively partnered on more than $240M in area roadway construction projects including $160M with the state funded Corridor of Commerce project through Elk River involving the removal of five signals and construction of four grade separated interchanges and the RCUT project south of Zimmerman and an additional $80M in improvements along Highway 10 just east of Elk River which remove signals and converts the existing expressway to a grade separated facility. If the RAISE grant is not awarded, the proposed safety and mobility improvements would be significantly delayed. In addition, the geometry of the roadway would be unchanged, meaning the Project Corridor would see projected increases in the crash cost and crash frequency. None of the planned innovative or safety improvements of the Project would be constructed.

SELECTION CRITERIA

ELIMINATE
a multimodal bottleneck

EXPAND
rural access and opportunity

IMPROVE
roadway safety

SUPPORT
climate and racial equity

SAFETY

Vehicular and pedestrian safety continues to be a major concern for Minnesotans using the US 169/CR 4 interchange. While collecting traffic count data in June 2021, video cameras captured footage of a vehicle crossing eastbound on CR 4 without stopping, and colliding with a SB vehicle on US 169 that resulted in air ambulance being dispatched. Also in June 2021, a pedestrian was struck and killed after stepping onto the highway.

FREQUENT CRASHES:
Crashes (1 fatality) reported in the last 5 years equaled $15.9 million in damages, the 2nd highest in the state for similar intersections. Both the crash rate (1.72) and crash severity (2.41) are almost 4 times above state averages for similar intersections, 0.45 and 0.63 respectively.

The total crash savings benefits from this project are nearly $11 million and were quantified for years 2026 to 2055 using the methodologies published in the Benefit Cost Analysis Guidance for Discretionalry Grant Programs. This project supports the ROUTES initiative by implementing key design interventions that will reduce the number of fatalities and serious injury crashes along US 169. Approximately 65 percent of Minnesota's severe lane-departure crashes occurred on rural roadways. This project will implement shoulder rumble strips and stripes, widen shoulders, realign 169, and construct a grade-separated interchange – all of which are significantly linked to a decrease in fatal and severe accidents. Crash data was obtained for the years 2009 through 2020 from the Minnesota Crash Mapping Analysis Tool (MnCMAT).

The existing geometry and alignment of US 169 presents a serious safety issue. Within the past twelve years (2009-2020), there have been: A disproportionate number of roadway fatalities occur in rural areas. The most dangerous place to drive in Minnesota is not on busy urban roads and interstates— it's in rural areas. Each year, 70 percent of Minnesota's total traffic fatalities occur on rural roads. The 80 counties in greater Minnesota represent just half of Minnesota's population, yet accounted for 63 percent of traffic fatalities in 2018. In 2018, 58 percent of all speed-related traffic fatalities occurred outside the Twin Cities and 69 percent of all distracted driving traffic fatalities occurred in Greater Minnesota. There are many factors that influence

the safety of rural roads, including poor nighttime lighting, traveling at higher speeds, narrow shoulder widths, and a prevalence of two-lane roads which encourage unsafe and illegal passing, resulting in a greater risk of head-on collisions.

The crash rate on US 169 at CR 4 is 1.9 crashes per million entering vehicles, which is higher than the statewide average for similar facilities in Sherburne County. Several crashes have occurred in the Corridor that included fatalities and major incapacitating injuries. In total, more than 200 crashes have occurred within the Project Area in the past ten years based on MnDOT data. Of these crashes, 65 led to injuries, and one crash resulted in a fatality.[2]

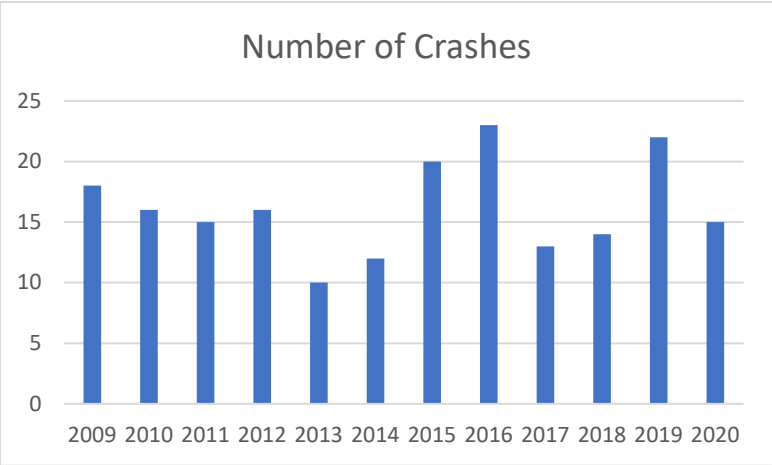
Rear-end (68 percent) and right-angle (15 percent) crashes make up the majority of all crashes recorded on US 169 at the CR 4 intersection.[3] Large numbers of rear-end crashes often indicate congestion due to queues on US 169 at the CR 4 intersection or unexpected conditions caused by high mainline speeds combined with frequent at-grade access. Safety on US 169 is a concern due to high mainline traffic volumes and speeds, along with the proliferation of at-grade access and the mix of large and small vehicles. In addition, a significant concern with respect to safety is the increasing traffic volumes forecast for US 169. As traffic volumes continue to increase on US 169, the number of gaps available diminishes for users accessing US 169 at unsignalized intersections. Consequently, as traffic volumes increase, users will take more risks when entering the traffic stream from side streets and the safety problems documented above will likely increase.

Figure 8. Crashes at US 169 and County Highway 4

Some improvements have been made at the intersection, such as realignment of Fremont Drive and the addition of advance warning flashers. However, the northbound approach to CR 4 is close to a curve which may impact sight distance. The available data show a disproportionately high number of crashes happen on the northbound approach to the intersection as drivers transition from high to low speeds. Replacing the US 169/CR 4 intersection with an interchange and overpass/frontage road system will reduce the number and severity of crashes in this area by reducing congestion, removing the need to stop while travelling at high speeds, and eliminating at-grade access points. **Figure 11** illustrates the severity of crashes that have occurred on US 169 within the Project Area and the total number of crashes by year.

[2] According to MnDOT, from 2009 to 2020 there were three serious injury crashes, 19 minor injury crashes, and 43 possible injury crashes, and one crash resulting in a fatality. The remaining 131 crashes caused property damage only.
[3] Trunk Highway 169 Elk River to Zimmerman, Environmental Assessment/Environmental Assessment Worksheet (EA/EAW) http://www.dot.state.mn.us/d3/projects/169elkriver/pdf/TH169_ElkRiverZimmerman-main.pdf

Figure 9. Crash Data (2009-2020)



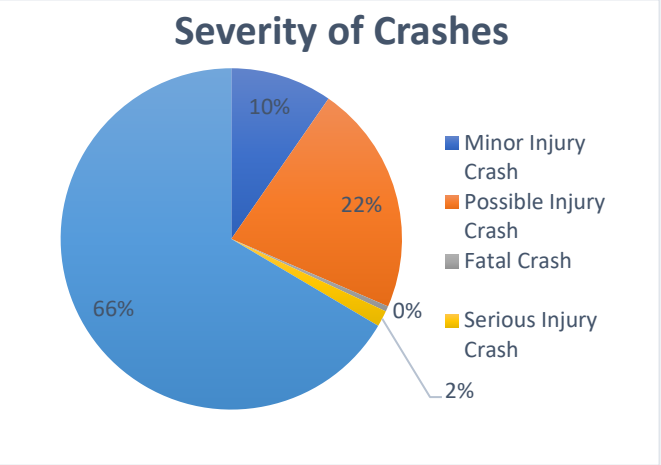


Table 2 summarizes the existing annual crash cost associated with the Corridor, projected total crash reduction, and annual crash cost savings. US 169 has experienced number of fatal and severe injury crashes. It is anticipated that safety improvements, including adding interchanges, will reduce severe crashes by 50 percent. Annual crash costs associated with the existing conditions of the intersection are estimated to be $606,000. As detailed in the BCA, the project is anticipated to generate substantial crash cost savings of about $277,000 annually.

Table 3. Crash Analysis

Existing Annual Crash Cost	Projected Total Crash Reduction	Projected Severe Crash Reduction	Estimated Annual Crash Cost Savings
$606,000	43%	50%	$277,000

ENVIRONMENTAL SUSTAINABILITY

SUPPORT FOR LOCAL AND REGIONAL SUSTAINABILITY PLANS

This project directly supports the State of Minnesota's Climate Action Plan, specifically the following goals:

Strengthen efforts to […] reduce reliance on single occupancy, internal combustion engine vehicles	**Reducing surface transportation emissions** by reducing the number of trips taken, making shorter trips, and increasing the efficiency of vehicles or traveling by foot or bike
Promote transit and multimodal travel	Increase availability of multimodal travel options

Annual VMT is expected to be impacted by realignment of US 169 and construction of an interchange and frontage road system. The change in VMT between No Build and Build conditions was obtained from the microsimulation model (as discussed in development of VMT section) and applied to emission rates by vehicle type. Average emission cost savings are expected to equal more than $500,000 through the life of the project.

The Project will decrease general purpose, recreational vehicle, and heavy commercial vehicle operational time, improve the through traffic travel speed reduction experienced during peak hours, and reduce vehicle idling (both personal and commercial) by reducing congestion, crash, and snow-related delays. The proposed project elements will promote multimodal transportation, pedestrian, and bicycle travel. For the workers who live within one mile of US 169, transit

travel time reliability, safety, and efficiency will improve. Pedestrians and bicyclists will experience increased safety with wider shoulders, divided medians and improved visibility. As part of sidewalk construction, all sidewalks and curbs will also be upgraded to meet ADA requirements.

WATER MANAGEMENT

The US 169 and CSAH 4 intersection and nearby drainage is included within the Mississippi River St. Cloud Watershed (HUC #07010203). This area is drained by Sherburne County Ditch 1, which further downstream joins with Tibbets Brook. Currently, Tibbets Brook is listed by the Minnesota Pollution Control Agency (MPCA) as an impaired waterbody because it has been found to hold chronically high e.coli bacteria numbers. With recent monitoring in 2019-2020, current data indicates that the stream often exceeds the Minnesota Central Region phosphorus standard. Therefore, it is anticipated the MPCA will be recommending within their 2022 Impaired Waters report that Tibbets Brook continue to be impaired for excessive bacteria, but also now be listed as "vulnerable – nearly impaired" for the phosphorus parameter. This new information warrants immediate attention to the waterbody in order to begin shifting the water quality trends in a positive direction. As the Tibbets Brook leads to the Elk River, Lake Orono, and then to the Mississippi River just upstream of the drinking water intake for the Twin Cities more than 3 million residents; reduction of pollution in Tibbets Brook has both local and regional importance.

The existing corridor contains minimal stormwater management practices to reduce nutrient loading or runoff volume to downstream water resources. Sediment and nutrients picked up along paved surfaces by runoff are discharged to surrounding wetlands, streams and lakes. In 2019 and 2020, Tibbets Brook exceeded the Central Region Streams phosphorus standard of 100 µg/L in 78 percent of water quality samples collected. The mean of all samples collected was calculated to be 121.6 µg/L. Bacteria monthly geomeans exceeded the regional standard of 126 MPN / 100 mL for this parameter 67 percent of the time in these two years. The 126 MPN / 100 mL is a chronic standard, indicating that exposure over a period of time can be harmful to human health. The mean of all collected data was calculated to be 157.3 MPN / 100 mL. Given the consistently elevated levels of phosphorus and bacteria in the stream, these pollutants are unlikely to be derived from singular locations in the watershed. The pollutants are likely derived from both urban and rural sources and so focused work is necessary on the farmlots that dot the landscape but also the major urban infrastructure which can carry pollutants over its impervious surfaces towards local waterways. The treatments outline in the proposed Project address potential pollutants originating from the local area within the greatly expanding City of Zimmerman, and compliment work that the Sherburne County and Sherburne Soil and Water Conservation District are doing to address sources from rural landowners in the watershed.

The Project will incorporate new stormwater management practices that reduce nutrient loading and runoff volume. Proposed improvements include sedimentation, filtration, plant uptake, and groundwater recharge methods through the use of many wet ponds and infiltration basins. These practices will address all of the water quality concerns noted previously; 1) sedimentation, filtration and infiltration of stormwater is known to be an effective measure for sediment and phosphorus reduction, 2) e.coli and other bacteria are often bound to particulates so these same practices should assist in bacteria removal, 3) bacteria are further removed from water through drying and exposing to sunlight for longer periods of time, making these practices all the more effective. These Best Management Practices (BMPs) are designed to meet Sherburne County and MnDOT standards. Further, the BMPs noted here are recognized within the

Sherburne County Local Water Management Plan and within the greater context of the Mississippi River St Cloud Watershed Restoration and Protection Strategies Plan as being locally effective tools, necessary to make progress towards water quality goals, and of great significance to be implemented within the headwaters of sub-watershed catchments such as Tibbets Brook due to the "watershed effect" of sending cleaner water downstream. The project will also include Minnesota Board of Water and Soil Resources (BWSR) native planting standards including native grasses and other plants into construction. The benefits of following native planting standards include enhanced runoff infiltration, species diversity, pollinator habitat, and landscape resiliency. Benefits from addressing nutrient runoff into the Mississippi River St. Cloud Watershed were derived by determining pollution costs per person and applying the rates to number of people impacted. National annual cost of water pollution from nutrients was divided by the US population (Table 1) to determine an average water pollution cost per person. This cost was then applied to the population of the City of Elk River[4], which is directly downstream from the runoff coming from the US 169 and CSAH 4 project area, to determine an estimate of potential water quality cost savings if nutrient runoff is to be mitigated. It is likely that additional individuals will be impacted by the reduction in nutrient runoff from the project area, as the Tibbet Brook flows into the drinking water intake for the Twin Cities, which contains more than 3 million residents. However, the water quality will likely be somewhat diluted from other sources by the time it reaches the Twin Cities. Thus, benefits to users outside of the City of Elk River were not monetized as part of the BCA but are likely to be realized. It was also assumed that these additional unquantified benefits may be offset from residual amounts of nutrient runoff remaining after the project improvements are incorporated, rather than a full elimination of nutrient pollution in the Tibbets Brook and subsequently, the City of Elk River.

QUALITY OF LIFE

Expand Rural Access and Opportunity

US 169, a Critical Rural Freight Corridor on the National Highway System, acts as an Interstate System connecting Central Minnesota with the Twin Cities metropolitan area. The roadway carries up to 3,500 trucks daily, which significantly exceeds typical truck percentages on most state highways at over 10 percent. Commodities identified the use of US 169 for heavy hauling in Minnesota include corn, soybeans, peas, dairy, cattle, hogs and pigs, as well as nonmetallic minerals, farm products, food products, cut stone, and paper products. The Central Minnesota Freight Study projected a growth of 1.7 percent per year in heavy commercial vehicle volumes by the year 2034.

SUPPORTED ECONOMIC GROWTH: An efficient road network would support Sherburne County's **economic vitality** for existing commerce and planned commercial and industrial growth. Controlled and safe access on and off Hwy 169 would support future development of 140 acres adjacent to the highway.

The at-grade signalized intersection of US 169 and CR 4 presents timing, limited mobility, product quality, and safety reliability issues for freight haulers. The congestion in this segment makes travel time reliability issues a common occurrence during both AM and PM peak hours, especially for large trucks trying to access US 169. This situation will only deteriorate, as the County is expected to grow significantly over the next 20 years– adding even more traffic and delay to a congested corridor. Unreliable safety conditions also create travel time reliability issues along this

[4] https://www.census.gov/quickfacts/fact/table/elkrivercityminnesota/IPE120219

segment of US 169, as freight traffic often interacts with inconsistent travel speeds, unsafe pavement conditions, narrow lanes, inadequate shoulders, and crash related delays. Freight mobility is severely impacted by the existing geometrics of the roadway. Trucks attempting to enter the roadway face inadequate turning radii and are often in conflict with other turning vehicles.

The US 169 and County Road (CR) 4 intersection is characterized by having a high rate of severe crashes and extensive mobility issues. Traffic delay at the signal is experienced for many hours of the day and during recreational time periods throughout the year, often resulting in mile-long queues on US 169 approaching the signal. Due to both demographic and economic changes, growing and sustained industry, and an increasing trend of commuters living in Central Minnesota and traveling to the Twin Cities for work, the regional transportation system is expected to experience increasing stress in coming decades. This change yields an opportunity to plan a freight system to address existing system challenges and accommodate new population and industries. The U.S 169/CR 4 Rural Safety and Mobility Interchange Project will provide the opportunity to improve access to freight facilities, while decreasing delays, eliminating a major freight bottleneck, and improving safety.

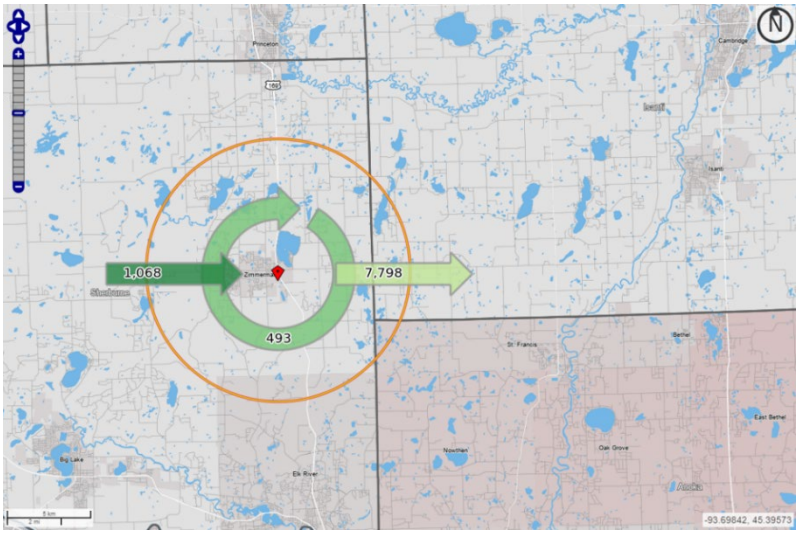
OBSTACLES TO ECONOMIC DEVELOPMENT:
The uncertain future of the intersection and poor access greatly hinder the sale of existing commercial properties. On the west side of Hwy 169, a lack of highway access is a major barrier to the development of large vacant properties.

According to the MnDOT District 3 Freight Plan, US 169 serves as a critical link between rural communities in Sherburne County and job opportunities in the Twin Cities urban center and is the most heavily used non-interstate highway freight corridor in Sherburne County. As a Principal Arterial roadway through the rural area, US Highway 169 is depended on as a safe and reliable transportation option for a variety of multimodal transportation users including rural residents, freight intensive businesses, and tourism-related travelers. The uncertain future of the intersection and poor access greatly hinder the sale of existing commercial properties. On the west side of US 169, a lack of highway access is a major barrier to the development of large vacant properties. An efficient road network would support Sherburne County's economic vitality for existing commerce and planned commercial and industrial growth. Controlled and safe access on and off US 169 would support future development of 140 acres adjacent to the highway.

The Project improves access to job opportunities in the immediate vicinity of the project for black, indigeneous, and people of color (BIPOC) populations by increasing efficiency, safety, and reliability of US 169. Construction of the interchange will also create new job opportunities that will expand employment opportunities in rural Central Minnesota. Based on FHWA guidance and MnDOT's review, it is estimated that the Project will generate approximately 242 new job opportunities.[5] Local residents will also have improved access to employment opportunities outside the County, as they are a net exporter of workers and US 169 serves as a primary connection the Twin Cities Urbanized Area, a major job center in Minnesota. According to 2018 U.S. Census data, 78.2 percent of Sherburne County residents travel outside of the County for work.[6] **Figure 8** demonstrates that most employees live within the County and commute outside of the County for employment.

[5] Based on an estimate of 11 jobs per $1 million in construction cost.
[6] U.S. Census Bureau. Longitudinal Employer-Household Dynamics Survey, Inflow/Outflow Job County in 2015. https://onthemap.ces.census.gov/

Figure 10. Commuter Job Flows and Distance/Direction in Sherburne County (2018)

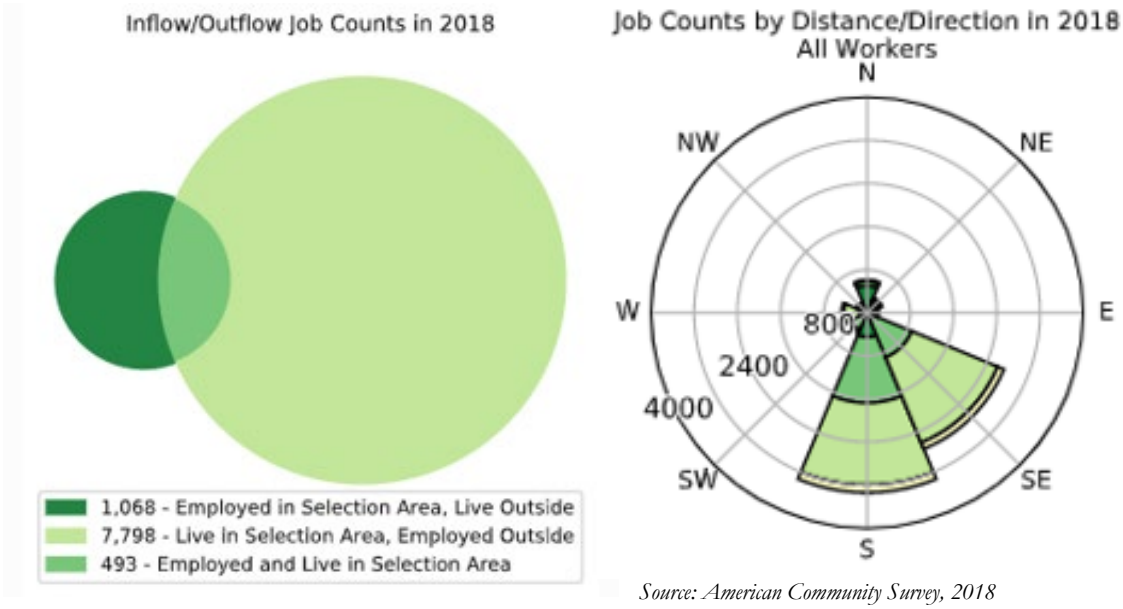


Many commuters to, or from, Sherburne County must use US 169 to reach work destinations. Approximately 35 percent of the total 50,822 employees in Sherburne County commute 25 to 50 miles to get to work. Most commuters are traveling eastward into the Twin Cities urban center.[7] The Project will benefit the employees living and commuting along US 169. The Project will ease congestion at the US 169/CR 4 intersection, resulting in reduced commute times. **Figure 9** illustrates the direction of commuters between place of residence and workplace for all residents within a five-mile radius of the Project.

"The Sherburne County Sheriff's Office supports this initiative knowing we could provide a safet route, not only for motorists, but for pedestrian and bicyclists, alike." *– Sherburne County Sheriff Joel Brott*

"Construction of the US Highway 169/CR 4 Interchange Project will greatly benefit ISD 728 staff and community members, creating safe opportunities to get to and from schools and local businesses." *– Dr. Daniel Bittman, Superintendent of Schools*

Figure 11. Commuter Job Flows and Distance/Direction in Sherburne County (2018)



Source: American Community Survey, 2018

[7] U.S. Census Bureau. Longitudinal Employer-Household Dynamics Survey, Job Counts by Distance/ Direction in 2015. https://onthemap.ces.census.gov/

Responding to Community Needs

The existing US 169/CR 4 intersection lacks trail and sidewalk facilities. Crossing US 169 is dangerous and difficult especially for children and those with limited mobility. The Project will incorporate a dedicated multi-use trail/sidewalk facility on the CR 4 bridge crossing US 169 to greatly improve safety for pedestrians as they cross through the frequently congested US 169/CR 4 intersection. The Project will provide a critical trail link between the east and west areas of the City of Zimmerman that are bisected by US 169. The proposed trail crossing US 169 will connect Lake Fremont and Grams Park, a 114-acre regional park, to Zimmerman's downtown, west of US 169 and the regional trail network. The Minnesota Statewide Climate Change Action Plan calls for programs that reduce greenhouse gas emissions through a reduction in congestion and an improvement in energy efficiency in freight movement.[8] The project will contribute to a positive reduction in greenhouse gases and will also contribute to a reduction in local food deserts. The US Department of Agriculture (USDA) recognizes an area around Princeton, Minnesota; north of the immediate project area as a food desert because of a relatively high number of housolds without vehicles that are more than ½ mile from a supermarket.

Sherburne County has invested in the expansion of a major north-south regional trail corridor, the Great Northern Trail. The Great Northern Trail provides a dedicated regional north-south route from the City of Elk River to the City of Zimmerman. The proposed trail crossing on the CR 4 bridge over US 169 will directly tie into the Great Northern Trail, significantly expanding access to regional trail facilities to the City of Zimmerman and surrounding rural communities. The trail will be extended north to Princeton and Milaca in the future. The proposed Project will connect residents and destinations east of US 169 to the trail. In addition to the safety benefits, trail facilities promote healthy lifestyles for people of all ages and backgrounds by providing easy free access, the ability to recreate, and open space for mental relief. Trails and open space give communities an essential identity and appeal. Well-maintained and accessible systems are key elements of strong, safe, family-friendly communities.

Using the EJSCREEN environmental justice tool provided by the EPA, environmental justice communities in proximity to the proposed Project site were identified. For environmental justice purposes, People of Color are all people except for those identifying as Non-Hispanic white as defined by the U.S. Census. The proposed Project connects to Elk River, nine miles south on Hiway 169, which has some areas in the 70 – 80 percentile statewide for People of Color statewide. US 169 is the shortest and fastest connection between the Twin Cities and the Mille Lacs Reservation near Onamia, 45 miles north of the Project area. This area is in the 90 – 95 percentile for People of Color statewide. Another area in the 80 – 90 percentile for People of Color statewide is in the City of Oak Grove, 15 miles southeast of the proposed Project. Low income populations identified by the EJSCREEN tool are defined as individuals whose income is less than two times the poverty level. Both Elk River (70 – 80 percentile low income statewide) and Princeton (80 – 90 percentile low income statewide, nine miles to the north) have areas with high percentages of low-income residents. Individuals age 25 and over with less than high school degree are identified by the EJSCREEN tool by educational attainment areas. There are many tracts along US 169 between Princeton and Elk River that have high percentages of population with less than HS degree, mostly in the 70 – 80 and 80 – 90 percentiles statewide. Other environmental justice indictators show pockets of linguistic isolation in Big Lake (90 – 95 percentile statewide, 14 miles to the southwest), and residents over the age of 64, with concentrations in Princeton and Elk River (both 90 – 95 percentile statewide).

[8] Minnesota Climate Change Action Plan, Page 137. https://www.pca.state.mn.us/sites/default/files/mnclimate-action-plan.pdf

Environmental Justice Impacts

The Project will improve access and safety for environmental justice populations living along US 169 to the north and south of the proposed Project. The proposed Project will improve access, safety and travel time for these communities as they travel through the Project area to employment, healthcare and educational opportunities in the Twin Cities metro, as well as employment and recreational opportunities to the north. Safety of travel journeys will be improved by removing conflict points, which may reduce crashes and injuries that could lead to expensive repairs or medical bills.

The Project will increase safety for vulnerable pedestrian roadway users and anyone not inside a motor vehicle including pedestrians, bicyclists, scooters, and motorcycles. Tribal areas have inequities in crash victims based on their population and the Project's proximity to low-income and tribal populations will improve the operating conditions for vulnerable road users as described in an FHWA cited OECD Safety Study, in which "Vulnerable road users" is a term applied to those most at risk in traffic, mainly those unprotected by an outside shield like pedestrians and two-wheelers.

Regarding inequities in crash victims, the applicant may provide any relevant information depending on project type, however research has shown that pedestrian fatalities are more likely in a community of color/disadvantaged communities. For example, by removing the last remaining traffic signal on US 169 between Rogers and Lake Mille Lacs, cars and trucks will be able to move through the interchange more efficiently without stopping and accelerating, reducing dwell time and emissions. There are three endangered species present in Sherburne County, the Monarch Butterfly, Northern Long-Eared Bat, Rusty Patched Bumble Bee. The Project will attempt to mitigate adverse effects to these species during construction. In addition, the Project includes a dedicated multi-use trail/sidewalk facility on the CR 4 bridge crossing US 169 with regional trail connectivity that will support multimodal active transportation in Zimmerman and the region. The new and improved connection can be used for recreational and employment purposes. This multi-use trail/sidewalk facility is described in more detail in the next section.

There is currently no planning documents or policies in place that directly address racial equity. The EJSCREEN environmental justice tool provided by the Environmental Protection Agency shows that seven percent of the population in the Project area census tract are People of Color. Larger People of Color populations live to the north of the Project area near the Mille Lacs Reservation by Onamia and in Elk River, as described in the previous section. In addition, the City of Princeton, nine mile to the north, is a federally designated food dessert. [9] The proposed Project will improve access to shopping and grocery stores to the south in Elk River and the Twin Cities metropolitan area.

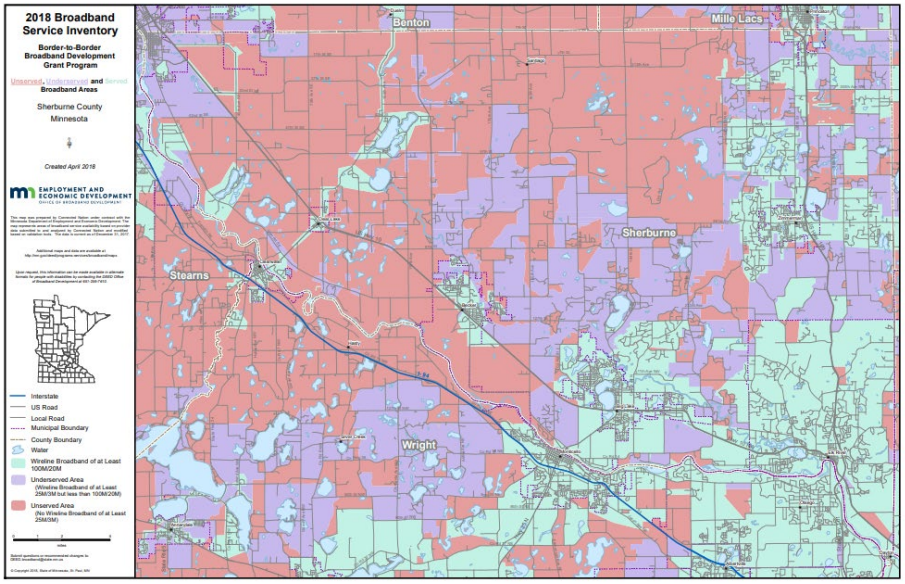
The Project will connect rural communities to fiber-optic internet access by supporting existing County efforts to deploy fiber to the immediate area. The Project will also identify opportunities for fiber optic conduits along US 169 and CR 4. Providing reliable and fast data communications is becoming necessary as local agencies and communities adopt technology. Fiber optic communications can vastly improve the speed and reliability of internet service – a requirement as population and employment centers continue to grow. Improving internet access along the US 169 Corridor will benefit the businesses, employees, and residents who work and live near the roadway, providing more reliable connections to help small businesses compete. Fiber optic networks will guarantee quality internet speeds along the

[9] Economic Research Service, U.S. Department of Agriculture. https://www.ers.usda.gov/data-products/food-access-research-atlas/go-to-the-atlas.aspx

corridor and serve as a reliable communication method for transportation applications such as traditional ITS applications as well as connected and automated vehicles.

Rural internet access is a growing concern. Rural communities are far less likely to have access to reliable internet service. Fiber-optic rings can vastly improve internet service in rural areas. Federal internet service standards have increased, and many rural areas have not been able to maintain quality internet access. Sherburne County can resolve this issue by ensuring fiber optic internet access along higher population and employment densities, including US 169.

Figure 12. Sherburne County Existing Broadband Network



In the past several years, the Sherburne County Public Works Department has installed conduit in strategic areas throughout the county as part of several road projects that are included within County road improvement plans. The County's goal in installing this conduit infrastructure is to "dig once" and facilitate the expansion of broadband service for County residents, businesses, institutions and public facilities. Updating broadband services concurrent with road projects allows the County to reduce overall project costs and construction disruptions. Since 2018, the County has continued to install conduit, and is actively working with additional providers to improve the broadband service over the next several years. The County has also recently been accepted into DEED's Telecommuter Forward program.

Providing reliable and fast data communications is critical as local agencies and communities adopt technology. Fiber optic communications can vastly improve the speed and reliability of internet service – a requirement as population and employment centers continue to grow and rely heavily on internet based services. Improving internet access along the US 169 Corridor will benefit the businesses, employees, and residents who work and live near the roadway, in particular providing more reliable connections to help small businesses compete. Fiber optic networks will guarantee quality internet speeds along the corridor and also serve as a reliable communication method for transportation applications such as traditional ITS applications as well as connected and automated vehicles.

ECONOMIC COMPETITIVENESS

Central Minnesota has large concentrations of food manufacturing and fabricated metal product manufacturing. Because of the heavy reliance on truck transportation in the region, the highway system is paramount to the efficient movement of freight. Motor carriers use the highway system to transport products to consolidation points and intermodal freight facilities. Freight mobility on US 169 is severely impacted by the existing geometrics of the roadway. Trucks attempting to enter the roadway face inadequate turning radii and often experience extended wait times to begin the turn. Trucks have limited movement within the intersection to move safely and are often in conflict with other turning vehicles.

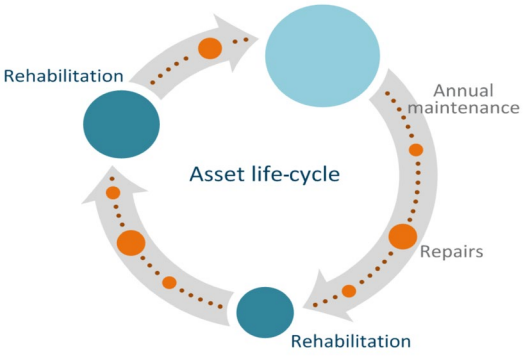
Intersection turning movement counts were collected over Memorial Day Weekend 2021 during peak hours on Friday and Monday at the intersection of US 169 and County Road 4. The preceding Thursday (May 27th) was also collected to model typical conditions. Thursday data was collected from 3 pm to 7 pm, and Friday and Monday data was collected from 11 am to 8 pm. During the Thursday peak hours, the intersection saw a total of 12,712 vehicles, with 0.7 percent of those vehicles being recreational vehicles, and 2.3 percent being single-unit or articulated trucks. During Friday peak hours, the intersection saw a total of 30,784 vehicles, with 1.7 percent of those vehicles being recreational vehicles, and 2.4 percent being single-unit or articulated trucks. During the Monday peak hours, the intersection saw a total of 28,066 vehicles, with 2.0 percent of those vehicles being recreational vehicles, and 0.6 percent being single-unit or articulated trucks. Queues along US 169 were also observed during the peak hours. On Thursday and Friday, only northbound queues were observed. Thursday queues were observed to be in a consistent flow of traffic, while Friday saw queues at a complete standstill. On Monday, only southbound queues were observed. Queues here were observed to be at a complete standstill. Based on the location of the cameras, the end of the queues on Friday and Monday were not within view, which were approximately 2/5 of a mile past the intersection.

Average daily traffic numbers (ADTs) were also collected along US 169 near the study intersection. On Thursday, there were 9,592 southbound vehicles north of the intersection, with 0.2 percent of those vehicles being recreational vehicles, and 7.1 percent being heavy vehicles. There were 18,104 northbound vehicles south of the intersection, with 1.0 percent of those being recreational vehicles, and 5.4 percent being heavy vehicles. On Friday, there were 12,555 southbound vehicles north of the intersection, with 0.4 percent of those vehicles being recreational vehicles, and 5.7 percent being heavy vehicles. There were 23,360 northbound vehicles south of the intersection, with 1.8 percent of those being recreational vehicles, and 4.7 percent being heavy vehicles. On Monday, there were 22,698 southbound vehicles north of the intersection, with 2.4 percent of those vehicles being recreational vehicles, and 3.1 percent being heavy vehicles. There were 8,149 northbound vehicles south of the intersection, with 0.7 percent of those being recreational vehicles, and 2.3 percent being heavy vehicles.

STATE OF GOOD REPAIR

Poor roadway condition adds to the limited mobility of freight vehicles, often limiting their ability to transport goods in a time efficient and high-quality manner and causing delivery drivers to travel at reduced speeds. Several freight facilities along the corridor stated their freight loads often shift or bounce along this segment, leading to damaged product and increased cost.

Life Cycle Costs



Graphic Source: MnDOT TAMP

Sherburne County has extensive experience with managing roadway improvement projects and has worked with MnDOT on numerous highway improvement projects. In coordination with MnDOT, the County has identified the anticipated cost estimates to effectively operate and maintain the Project Corridor once it is constructed. MnDOT will be responsible for the operation and maintenance of the state highway and has dedicated funding available to ensure that the roadway is properly maintained. The County has committed to meeting construction start and end dates and is willing to implement any accountability measures based on these dates. MnDOT will operate and maintain the US Highway 169/CR 4 interchange as it does the 12,000-mile state highway system. Long-term maintenance operations will be performed by MnDOT based upon its typical maintenance schedule for bituminous roadways. **Table 4** presents key maintenance improvements that would be required during the lifecycle of the Project based on MnDOT guidance.

Operation and Maintenance Funding

Table 4. US 169 Operation and Maintenance Plan

Activity	Total Cost
Bridge Inspection Costs	$60,000
Annual Routine Maintenance	$834,000

Financial trends indicate that operation and maintenance revenues have slowed compared to previous decades. Consequently, MnDOT is committed to implementing timely investments in capital and preventative maintenance treatments to extend the service life of assets while reducing lifecycle costs. Ongoing operating and maintenance (O&M) costs on the state highway system are funded by taxes and fees from four main revenue sources:

- State gas tax (motor fuel excise tax),
- State tab fees (motor vehicle registration tax),
- State motor vehicle sales tax, and
- Federal highway funds (highway user tax distributions, flexible highway account, and County State Aid Highway Fund)

MnDOT Transportation Asset Management Plan (TAMP)

MnDOT has a demonstrated history of fully funding maintenance improvements and has established the agency as a leader in asset management. MnDOT developed its first Transportation Asset Management Plan (TAMP) in

accordance with the 2012 Moving Ahead for Progress in the 21st Century Act (MAP-21). MnDOT's TAMP expanded beyond minimum requirements per MAP-21 to include the entire state highway system as well as other infrastructure within the right-of-way corridor. MnDOT's TAMP was a national pilot project and serves as a guide for other states. MnDOT applies the TAMP as a guide to analyze life-cycle costs, evaluate risks and develop mitigation strategies, establish asset condition performance measures and targets, and develop investment strategies. The TAMP will serve as a guide to ensure all necessary Project operation and maintenance is implemented.

SECONDARY SELECTION CRITERIA

Partnership

Grant Recipient

Primary Contact

Andrew J. Witter, P.E., Public Works Director

13880 Business Center Drive NW, Suite 100

Elk River, MN 55330-4668

Phone: 763.765.3302

Email: Andrew.Witter@co.sherburne.mn.us

Sherburne County is the project sponsor of this RAISE grant application. The County has been a proactive leader and advocate for this Project for several years. The County has extensive experience with procuring and developing transportation improvement projects including several state and federally funded projects. The County's 2040 Comprehsive Plan prioritizes major future transportation investments and identifies potential fiscal resources to advance these projects.

Project Partners

MnDOT is a dedicated partner in this Project. MnDOT has established a firm commitment of investment towards improving the US 169 corridor. MnDOT has participated in the NEPA environmental review process and development of the final design. MnDOT has reviewed the design plans and will provide final approval.

MnDOT will operate and maintain the Project as part of the State highway system as stated in MnDOT's letter of support for the Project. MnDOT and Sherburne County have an agreement for preliminary engineering for this Project. The County and MnDOT will negotiate agreements on the construction and long-term maintenance of the Project. Section V, Criterion #4 (Performance and Accountability) includes additional details regarding MnDOT's operation and maintenance commitment towards the Project. MnDOT and the County have successively partnered on more than $170 Million in roadway construction projects in the corridor, including the Corridor of Commerce project through Elk River involving the removal of five signals and construction of four grade separated interchanges and the RCUT project south of Zimmerman.

Freight Community

Sherburne County has solicited input on the Project from several freight generators in the US 169 Corridor. Letters of support have been received by business and industries in the Corridor.

Innovation

Intelligent Transportation Systems (ITS)

The Project will include Intelligent Transportation Systems (ITS) elements. ITS technologies advance transportation safety, mobility, and efficiency by integrating advanced technologies into transportation infrastructure or vehicles. ITS

encompasses a broad range of electronic communication and sensing technologies but traditionally includes elements such as dynamic message signs, CCTV cameras, and vehicle detection. By deploying these ITS elements along US 169, the County can provide traveler information such as travel times, alternate routes, and incident notifications. These enhance driver awareness and allow drivers to make informed decisions while traveling. These deployments can also be used for incident management purposes such as identifying crashes, detecting queued traffic, and emergency response.

The Project will explore installation of wireless dynamic message signs that provide real-time traffic advisory and route guidance information to road users. By providing information to road users in advance of a situation, they help to improve safety and reduce congestion when an incident occurs or in the event of poor road or weather conditions.

Innovative Project Delivery

Civil Information Management Software

During public engagement of the corridor study, project designers used innovative Civil Information Management (CIM) software for preliminary modeling and visualization of the proposed project to understand and mitigate impacts. This allowed stakeholders and partners to make decisions through a visual compare and contrast in real-time.

The Project will continue to utilize CIM software to model and visualize the project, as well as increased transparency of the project. The transparency will enable owners, consultants, contractors, and stakeholders to work together easily. The CIM software enables designers to make constant adjustments to the design to ensure the best alternatives. The software also uses embedded 3D visualization as part of the process. This enables an effective conflict detection, rapid design review and validation. These efforts will reduce project schedule timelines and overall costs.

Best Value Procurement

Since 2007, public agencies in Minnesota have been explicitly enabled and encouraged to use the best value method to procure construction contracts. MnDOT and related transportation agencies utilize the best value procurement process to deliver high-quality projects faster and more cost effectively by awarding contracts based on quality rather than price alone. Sherburne County would prefer to utilize best value procurement will help the Project deliver long-term benefits on an efficient schedule and budget. Sherburne County has participated on projects that have utilized the best value procurement process and will consider applying this procurement process for this Project.

CMGC Procurement

Sherburne County will lead the procurement process for the Project. The County intends to utilize a Construction Manager/General Contractor (CMGC) approach. Through the CMGC process, Sherburne County would select a contractor to collaborate with the design and the County during the design phase to identify risks, provide cost projections, and refine the project schedule. This approach allows has been found to expedite the design phase, reduce construction durations, and reduce project risks. CMGC is relatively new and has been utilized to complete the design and construction for the US 169 freeway conversion and interchange projects in the City of Elk River, south of the US 169/CR 4 intersection. Sherburne County and MnDOT are experienced with this approach and found it to be successful

in enhancing designer-contractor collaboration, reduce project costs, and optimize the project schedule. CMGC has been identified by FHWA as a Every Day Counts initiative as an accelerated project delivery method.[10]

Accelerated Bridge Construction

MnDOT has specifically identified the US 169/CR 4 interchange as a suitable candidate to explore opportunities to utilize Accelerated Bridge Construction (ABC) technologies to expedite the construction of the CR 4 bridge over US 169 to minimize traffic delays, road closure, and potentially reduce project costs. The FHWA Every Day Counts initiative has recognized ABC technologies to be an effective accelerated project delivery method.

Implementing ABC methods presents unique challenges and opportunities. The advantages of an ABC method vary by project and location but generally address the following project needs:

- Increased safety
- Minimized traffic disruption
- Improved quality
- Reduced environmental impacts
- Increased value to the owner

Possible techniques include:

- Bridge slide - This method includes building the bridge on temporary supports adjacent to the bridge pier while the roadway embankment and other major items are under construction. The bridge can then slide into place in a relatively short time period of time and save the projects several months of construction time and cost.
- Precast Bridge Elements - This approach utilizes non-traditional items such as full-depth bridge decks, prefabricated bridge deck pieces, and beam units which all allow for expedited construction timelines and save the projects several months of construction time and cost.

Environmental Review and Permitting

The Project has completed the environmental review and incorporated feedback from agency stakeholders into proposed design to minimize the Project's impacts to sensitive environmental resources. An Environmental Assessment (EA) was reviewed by FHWA in 2009 in accordance with the National Environmental Policy Act (NEPA). In July 2021, the County will begin an EA Re-Evaluation which is expected to extend through the remainder of 2021.

The Project will benefit from existing MnDOT programmatic agreements and agency liaisons to maximize the efficiency of environmental review and permitting processes. MnDOT has executed a programmatic agreement with FHWA and the State Historic Preservation Office (SHPO) to streamline the Section 106 review process. Additionally, MnDOT has established a MnDOT has established agency liaisons with the US Army Corps of Engineers (USACE) to directly manage the Section 404 permitting process for state highway projects.

Innovative Financing

Sherburne County is one of the leading counties in Minnesota to implement a ½ percent sales tax and an excise tax to create a new, non-federal transportation revenue source for county and state transportation projects in the County. Over the next twenty-four years, the collected revenue is expected at $135 million. This new dedicated transportation funding source will enable the County to provide a local match to state and federal funding for critical infrastructure

[10] FHWA Center for Accelerating Innovation. Construction Manager/General Contractor. https://www.fhwa.dot.gov/innovation/everydaycounts/edc-2/cmgc.cfm

projects, including this Project. In 2018, Sherburne County passed resolutions to approve a new, dedicated, non-federal transportation revenue. The Sherburne County Board of Commissioners adopted a special half-cent, county-wide sales tax to fund transportation projects. This tax revenue will generate approximately $3.2 million per year, for specific high-priority projects, including the US 169/CR 4 interchange. Sherburne County and MnDOT have partnered to secure more than $18 million in local and State funding to support the Project. This non-federal share represents approximately 42 percent of the anticipated total future eligible project costs. **A RAISE grant award will enable the County to leverage existing non-federal and Federal funding to implement all safety and mobility improvements.**

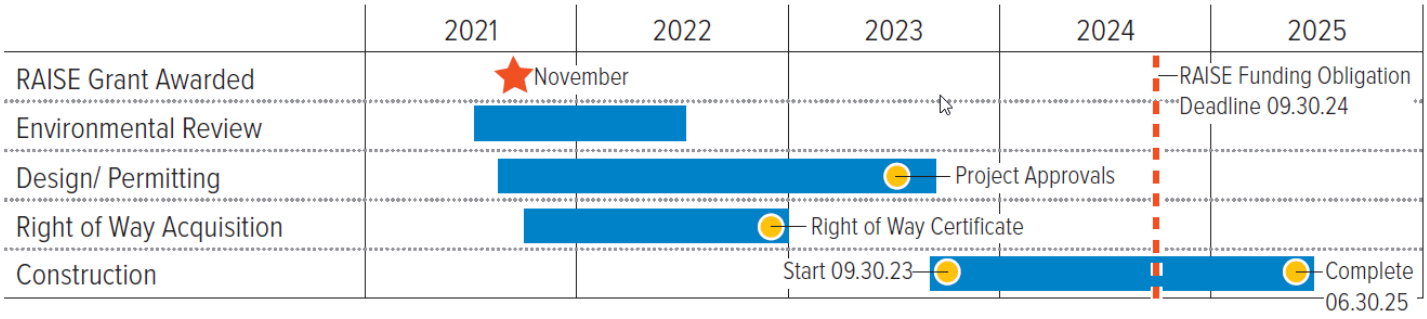
ENVIRONMENTAL RISK

TECHNICAL FEASIBILITY

The County is the lead agency on the US 169 Rural Safety and Mobility Interchange Project and all other project development activities which utilize federal funds. The County has delivered several federally funded highway projects and understands the rules and procedures to manage a federal grant. Sherburne County and MnDOT have worked together to explore the best ways to address access, safety, freight movement, and mobility needs along US Highway 169. To move the project forward and fully understand the impacts and cost, Sherburne County has proceeded with detailed design and preparation of a final bid package for construction letting. Preliminary design layouts have been completed and cost estimates have been prepared that include contingencies. The County is experienced in right-of-way acquisition and has initiated communication with adjacent property owners in partnership with the City of Zimmerman to minimize project risks and schedule delays. The right-of-way parcels are anticipated to be acquired in June of 2023.

The proposed design meets all current USDOT, AASHTO, and MnDOT standards for multi-lane highways. General details of the design include: 70 mph design speed, 12-foot lanes, 10-foot outside shoulder, 4-foot inside shoulder, rural ditch drainage (NOAA Atlas 14 - Precipitation Frequency met for design), 84-foot centerline spacing, and bituminous pavement. The new bridge overpass will be designed to accommodate oversized and overweight loads with a 17-foot vertical clearance versus the traditional 16-foot clearance design. The final design has identified the final roadway alignment, profiles, geometry, drainage elements, and grading limits for the Project. Expected unit costs are based on the most recent record of similar highway construction projects in Minnesota.

PROJECT SCHEDULE



For a detailed breakdown of the Project schedule, please see the *"Detailed Project Schedule" on the project website*.

Letting date: July 2023

The Project schedule demonstrates that grant funds can be obligated a year in advance of the RAISE funding obligation date requirement of September 30, 2024. Sherburne County anticipates that construction will begin by September 30, 2023 and be completed by June 2025. All property and right-of-way acquisition will be completed in accordance with 49 CFR Part 24 and other Federal regulations. The County has an experienced right-of-way acquisition staff that have been actively involved during the project development process and have worked with MnDOT on numerous state highway projects. An official map has been prepared and a right-of-way agreement with MnDOT is close to completion. As discussed in the following section, an Environmental Assessment was approved in 2010. The County is in the process of updating this environmental review document which is anticipated Fall 2021.

REQUIRED APPROVALS

Environmental Approvals

FHWA approved an Environmental Assessment/Environmental Assessment Worksheet (EA/EAW), a joint Federal/State document in fall 2010 to fulfill Federal and State environmental review requirements. The project reviewed as part of the approved EA/EAW included reconstruction of US 169 from the City of Elk River and the City of Zimmerman to a freeway facility including a system of interchanges, overpasses, and frontage/backage roads along US 169 to improve mobility and safety along the corridor Due to the age of the approved document, an EA Re-Evaluation is required to address any new environmental impacts resulting from the Project. Sherburne County has initiated this effort and will coordinate with MnDOT and FHWA on the process. Final plan submittal is expected by Fall 2021. As required, all remaining permits will be included in the final submittal. The project site has undergone substantial analysis as part of the past EA/EAW process. Sherburne County will leverage past investigations and studies completed as part of the approved environmental review to address anticipated environmental impacts and expedite the review process.

State and Local Approvals

MnDOT has demonstrated a vested interest in improving safety and mobility along US 169 as a critical regional corridor. The project is consistent with MnDOT's long-term vision for the US 169 Corridor as demonstrated in the Highway 169 Elk River to Zimmerman Study. Sherburne County and MnDOT have a longstanding relationship in partnering on investments in the US 169 Corridor. MnDOT, in partnership with Sherburne County and the City of Zimmerman, led the development of the approved EA/EAW for the US 169 freeway conversion and interchange improvements for the corridor between the Cities of Elk River and Zimmerman. As part of the proposed US 169/CR 4 interchange, Sherburne County will lead the development of the EA Re-Evaluation in partnership with MnDOT, the City of Zimmerman, and Livonia Township. Sherburne County has closely coordinated with MnDOT in advancing the project. MnDOT has provided a letter of support for the project and is committed to the long-term operation and maintenance of the interchange.

Required State and local approval were identified as part of the approved EA/EAW review. As part of the EA Re-Evaluation, required agency reviews will be re-assessed. Sherburne County will coordinate with the Minnesota Pollution Control Agency (MPCA), Minnesota Department of Natural Resources (DNR), Minnesota State Historic Preservation Office (SHPO), and other agency liaisons to obtain all agency approvals and permits as the final design is advanced.

Support for the Project is provided for by several different levels. There is a broad base of support for the project, as shown by the letters of support submitted for this application. These include Letters of Support from MnDOT, the City of Elk River, Zimmerman Chamber of Commerce, County Sheriff and Fire Departments, and US Senate and Representatives from MN. The Minnesota Statewide Freight System and Investment Plan designates US 169 within Sherburne County as a Critical Rural Freight Corridor and a high priority statewide Interregional Corridor (IRC) in the Central Minnesota Freight Plan. The US 169/CR 4 interchange was specifically identified by Sherburne County as a top legislative priority. Sherburne County has secured federal and State bonding funds for the Project. Upon award of RAISE funds, the TIP and STIP would be amended to incorporate the full project scope. The US 169 Project is included in all relevant local, metropolitan, and state planning documents.

RISK ASSESSMENT AND MITIGATION

Potential risks, constraints, and recommended mitigation measures have been identified as part of the previously approved EA/EAW. Sherburne County and MnDOT have investigated potential constraints such as adjacent contaminated sites, right of way acquisition, and natural resources A preliminary layout and project cost estimates have been prepared. The estimate includes significant contingency for acquisition costs. The County will exercise eminent domain if necessary, to gain access to the property to construct the Project within the required schedule constraints. The County does not anticipate that environmental uncertainties will be encountered as the final design is advanced given the extensive studies previously completed. The Sherburne County Board of Commissioners has demonstrated the County's commitment to provide the local match as documented in the adopted resolution and MnDOT's has provided a letter of support committing to the long-term maintenance and operation of the Project. Sherburne County and MnDOT have successfully advanced the procurement to construct the nearby freeway conversion and interchange projects along the section of 169 south of the Project in the City of Elk River. Sherburne County will utilize this experience to accelerate the project development for the US 169/CR 4 interchange.

BENEFIT COST ANALYSIS

NO BUILD ALTERNATIVE

The No Build Alternative included leaving the US 10 and CR 4 interchange in its current configuration of an at-grade signalized intersection. Traffic impacts associated with programmed regional roadway improvements were included in the analysis.

BUILD ALTERNATIVE

The proposed project will replace the existing signalized intersection with a full access interchange and frontage road system. The interchange includes a tight ramp configuration west of US 169 and a loop in the southeast quadrant of the interchange. The CR 4 bridge over US 169 will also include a multimodal trail facility along the north side of CR 4. The BCA for the Build Alternative also assumed the same programmed improvements to the regional transportation system that were assumed in the No Build Alternative.

BCA METHODOLOGY

A detailed benefit-cost analysis methodology is included in **Attachment A**. The main components analyzed for the benefit-cost analysis included:

- Travel time/delay (vehicle hours traveled – VHT)
- Operating costs (vehicle miles traveled – VMT)
- Crashes by severity
- Environmental and air quality impacts
- Initial capital costs, applied evenly over the duration of the construction period.
- Remaining Capital Value
- Operating and maintenance costs, including annual bridge inspection and routine pavement maintenance associated with the interchange and frontage road system.

PROJECT BENEFITS

Travel Time Savings: $24,514,258
Economical Competiveness Operational Benefits: $3,456,770
Safety Crash Savings: $10,900,000
Environmental Sustainability Air Quality: $570,101

BCA RESULTS

The benefit-cost analysis provides an indication of the economic desirability of a scenario, but results must be weighed by decision-makers along with the assessment of other effects and impacts. Projects are considered cost-effective if the benefit-cost ratio is at least 1.0. The larger the ratio number, the greater the benefits per unit cost. Results of the benefit-cost analysis are shown in Table 4. See Attachments for the complete benefit-cost analysis memo and workbook. The benefit-cost analysis resulted in the project having a benefit-cost ratio of 1.4 and net present value of more than $13 million. The net present value, or the project benefits minus the costs, reflects the magnitude of a project's return on investment and is sensitive to the size of capital investment being undertaken. Based on the net present value, the project is expected to provide the public with $13 million of additional benefits relative to the incurred costs, which can increase the economic vitality and quality of life throughout the region.

Several factors were not quantified as part of the analysis that could potentially add to the benefits assumed in the BCA. These factors include increased travel time reliability in the study area due to the increase in roadway capacity, safety and quality of life benefits associated with connecting future trails on the east and west sides of US 169, savings on future rehabilitation costs required under a No Build scenario on the portions of US 169 and CR 4 being reconstructed as part of the realignment and interchange construction, and benefits accrued in the second half of year 2025 after project opening. Accelerating the benefit-cost analysis period by a half-year is expected to produce approximately an additional $945 thousand in net present value.

Table 5. Total Project Results

	Initial Capital Cost (2019 Dollars)	Project Benefits (2019 Dollars)	Benefit-Cost Ratio (7% Discount Rate)	Net Present Value (2019 Dollars)
No Build vs. Build	$31.1 million	$44.5 million	1.4	$13.4 million