US 169 Rural Safety & Mobility Interchange Project

OUTCOME CRITERIA NARRATIVE

FY 2023/2024 Multimodal Project Discretionary Grant (MPDG) Program

Rendering of Interchange project

Project Type: INFRA/Rural Capital Project
Eligible Project Costs: $50,068,000
FY 2023/2024 MPDG Funds Requested: $24,732,000

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Supporting Information can be found at:
https://www.srfconsulting.com/sherburne-county-us-169/

SHERBURNE COUNTY

US 169 Rural Safety & Mobility Interchange Project

Submitted by Sherburne County

FY 2023/2024 MULTIMODAL PROJECT DISCRETIONARY GRANT (MPDG PROGRAM)

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Project Outcome Criteria

The Sherburne County US 169/CR 4 interchange project advances many of the Project Outcome Criteria under the MPDG program. Currently the corridor exhibits significant crash issues and is a deadly transportation barrier between residences, employment, freight traffic, and recreational points of interest, and the corridor represents a danger to travelers of all modes. The Project will introduce necessary safety improvements to directly address the quantity and severity of crashes occurring within the corridor. Project improvement countermeasures have been strategically selected and targeted to achieve maximum safety benefits.

In addition to improving roadway safety for all users, this project includes an emphasis on eliminating a known traffic bottleneck, reducing congestion and greenhouse gas emissions from the transportation system, expanding rural access to opportunity, and supporting the movement of non-motorized transportation options.

IMPROVE	ELIMINATE	EXPAND	SUPPORT
safety for all users across all modes	a bottleneck and reduce greenhouse gas emissions	rural access and opportunity	climate and racial equity

1.

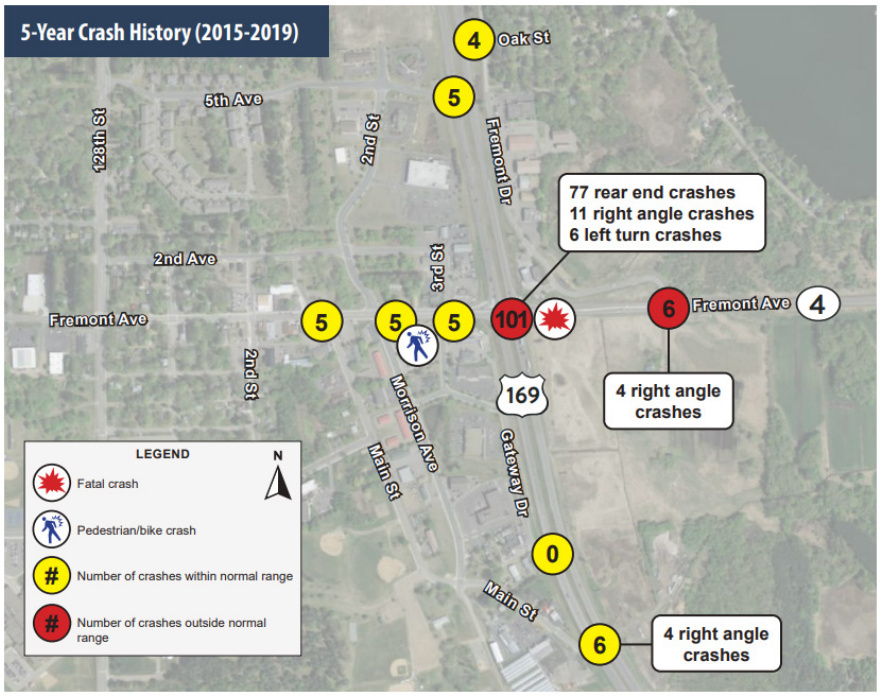
SAFETY

Roadway safety for all users is a serious concern at the US 169/CR 4 intersection. The US 169/CR 4 interchange project is intended to address safety by providing a transportation network that provides facilities for various transportation modes. This portion of US 169 is one of the more dangerous road sections in the region, **ranking as the second most unsafe intersection in Central Minnesota. The intersection has a crash rate that is five times the statewide average and a serious crash rate that is six times the statewide average.** From 2015-2019 there were 101 crashes at the intersection, including 77 rear end collision, which is a direct result of a high-speed roadway, an unexpected traffic signal (only one in 75 miles along this stretch of US 169), and due to increased queueing lengths at the traffic signal as a result of increasing roadway volumes. Figure 1 shows the intersection's crash history from 2015-2019.

A key focus of the project is to make the US 169/CR 4 intersection safer, and grade separating the existing intersection will address this issue. The project will eliminate conflict points for vehicles and pedestrians along a high-speed and high

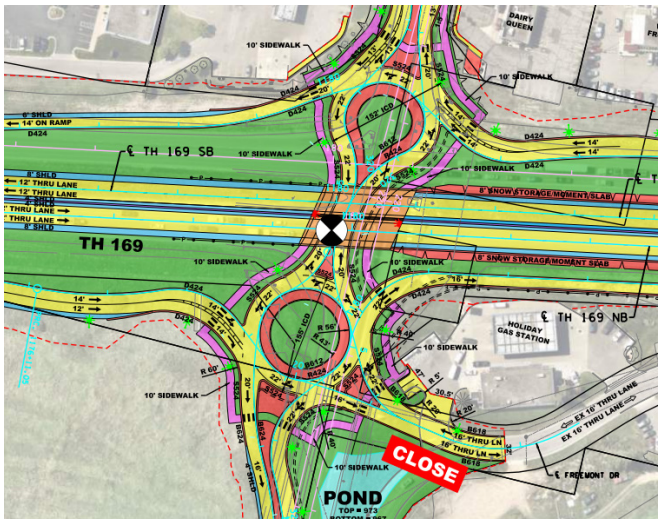
The initial project design included in past grant applications required substantial right-of-way needs and footprint expansion. Since then, Sherburne County has participated in USDOT debriefs and has modified the project based on the feedback provided to better reflect updated priorities as identified in the Notice of Funding Opportunity. In particular, the project incorporates context sensitive design features to minimize the need to acquire additional right-of-way and fitting the project within the existing footprint of the roadway.

Figure 1 **Five year crash history, 2015-2019**



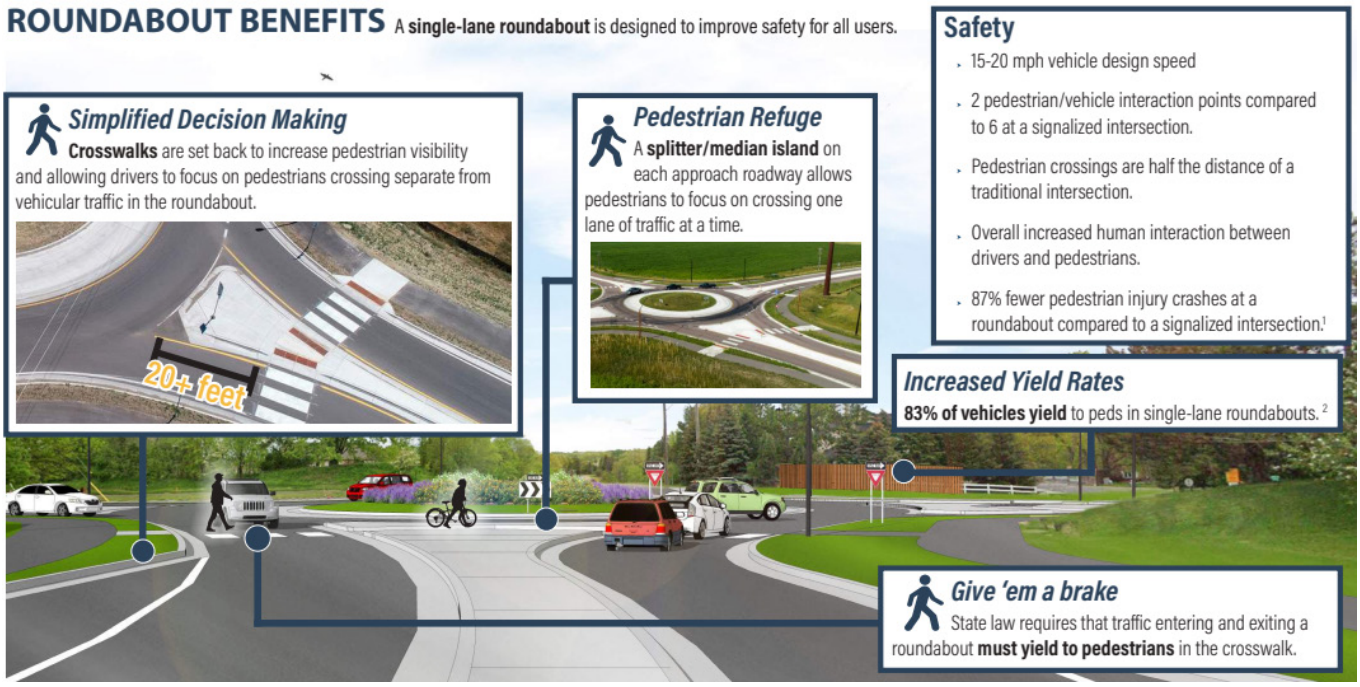
conflict corridor. The US Department of Transportation's Rural Opportunities to Use Transportation for Economic Success (ROUTES) initiative, seeks to address disparities in rural transportation infrastructure. Consistent with the goal of ROUTES, this project will address disparities by implementing design interventions that will reduce the number of fatalities, serious injury crashes, and conflict points along this portion of US 169. This project will incorporate the following design interventions to alleviate safety issues at the intersection of US 169 and CR 4:

- Replacing the signalized US 169 and CR 4 intersection with an interchange, overpass, and frontage road. **The signal is the final remaining one along a 75-mile section of US 169.** It is unexpected by drivers, traveling in excess of 65 miles per hour (mph), and is the primary driver of crashes in the area (77 rear end crashes). Removing the signal will reduce the number and severity of crashes by reducing congestion and eliminating the need to stop while travelling at high speeds. The grade separated intersection will allow for increased capacity and uninterrupted flow in an area that is experiencing long queues and backups.



move bullet

- Building a multimodal trail crossing under US 169 on both sides of CR 4, providing separated facilities for pedestrians and bicyclists, reducing limited potential conflict points with vehicles. Current facilities require pedestrians to traverse US 169, creating an opportunity for conflict with high-speed vehicles traveling on a 65-mph posted speed limit roadway. Installation of the interchange will remove pedestrians and bicyclists from US 169 and CR 4, allowing them to safely pass though the underpass and eliminating opportunities for conflict with high-speed vehicles. FHWA's Proven Safety Countermeasures indicate the presence of a sidewalk or pathway on both sides of the street corresponds to approximately a 65-89 percent reduction in "walking along road" pedestrian crashes. Providing paved, widened shoulders (widened from four to eight feet) on roadways that do not have sidewalks corresponds to approximately a 71 percent reduction in "walking along the road" pedestrian crashes.
- Installing roundabouts on CR 4 at the intersection with the US 169 on/off ramps, allowing safe and free flow of traffic on and off US 169. Roundabouts will not only reduce delay, but are proven to reduce pedestrian injury crashes by 87 percent compared to a signalized intersection. Pedestrians and bicyclists have refuge through a splitter/median island at each approach and have dedicated crosswalks. Eighty-three percent of vehicles yield to pedestrians in single-lane roundabouts.

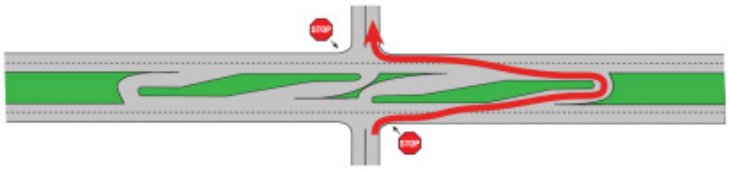


- Removing six at-grade access points onto US 169 to control vehicles turning onto the high-speed roadway.

What is a Reduced Conflict Intersection (RCI)?

An RCI, also known as J-turns or RCUTs, is an intersection on a divided highway that decreases fatalities and injuries caused by broadside crashes. With an RCI, drivers from the side street only have to be concerned with one direction of traffic on the highway at a time. You don't need to wait for a gap in both directions to cross the major road.

In an RCI, drivers from the side street always make a right turn followed by a U-turn. Motorists approaching divided highways from a side street are not allowed to make left turns or to cross traffic; instead, they are required to turn right onto the highway and then make a U-turn at a designated median opening. This reduces potential conflict points and increases safety. This is the type of intersection proposed at 255th and 269th Avenues.



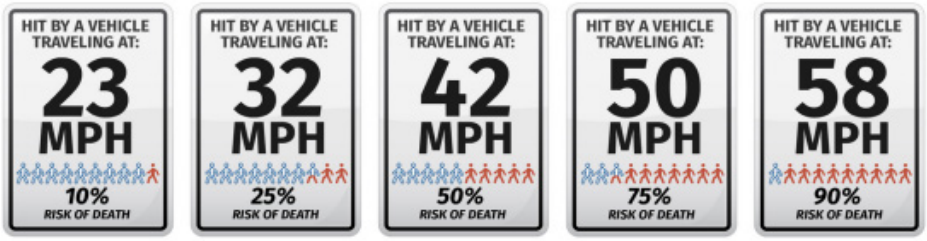
- **Shoulder Rumble Strips**
  13-51%
  reduction in single vehicle, run-off-road fatal and injury crashes on two-lane rural roads.[4]

Improving access points at 255th Avenue and 269th Avenue to restrict movement to allow right-in/right-out/left-in-only (¾ intersection), which controls traffic flow on and off of US 169 and prohibits left turns onto the roadway. Reduced Conflict Intersections (RCI's), also known as J-turns or RCUTs – show a 70 percent reduction in fatalities and 42 percent reduction in injury crashes. RCI's are faster to build and are less expensive to maintain as compared to traffic signals.

- Reconstructing the roadway with wider shoulders and rumble strips which will help to reduce run-off-the-road crashes. The Office of Safety FHWA's Proven Safety Countermeasures indicate that shoulder rumble strips demonstrate a 13-51 percent reduction in single vehicle, run off-road fatal and injury crashes on two-lane rural roads.

Bullets out of place and seems a little jagged in this section.
Bullet under roundabout feels like a callout, rumble strips graphic needs to shift to right column.

Due to the high-speed nature of US 169, any vehicle versus pedestrian or bicyclist crash along US 169 will likely result in a fatality. According to the National Roadway Safety Strategy, 78 percent of vehicles involved in fatal pedestrian crashes were traveling on a roadway with a speed limit of greater than 35 miles per hour (mph).[1] Further, pedestrians hit by vehicles traveling at 58 mph or higher have a 90 percent risk of death. The US 169/CR 4 Interchange Project will remove pedestrians from the high-speed US 169 (posted speed of 65 mph), greatly enhancing pedestrian safety.



As shown in Table 1, below, the safety improvements included in this project are expected to result in reduced predicted crashes in the project area by 85 percent between 2025 and 2045. A difference that corresponds to a crash cost savings of over $45 million dollars.

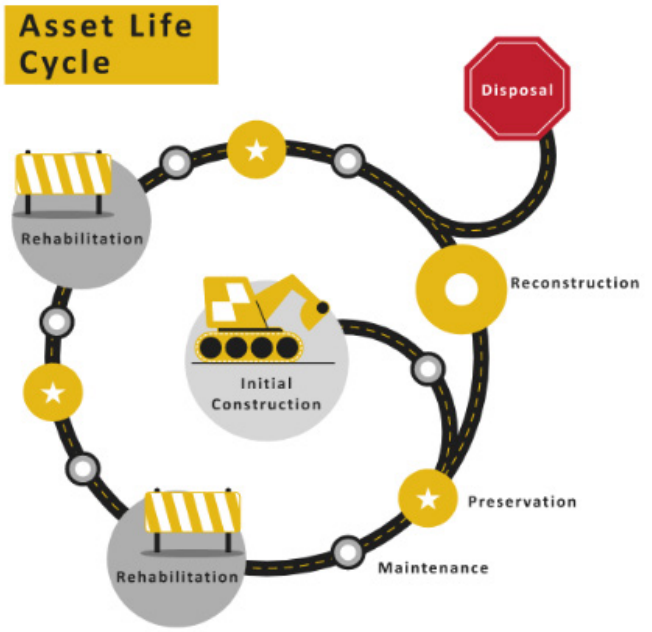
Table 1 Predicted Crash Reduction

Crash Severity	2025-2045 No Build	2025-2045 Build	Crash Reduction
Predicted Crashes per Year	651.1	95.6	555.5
Predicted Fatal Crash	1.8	0.0	1.8
Predicted Serious Injury Crash	5.8	0.1	5.7
Predicted Minor Injury Crash	47.1	1.8	45.2
Predicted Possible Injury Crash	168.8	5.8	162.9
Predicted Crash Costs	$47 million	$1.5 million	$45.5 million

2. STATE OF GOOD REPAIR

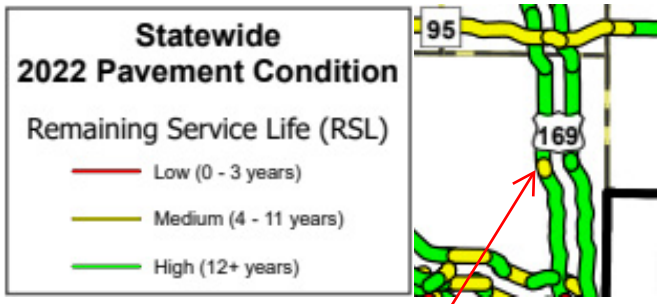
The Project will reduce future wear-and-tear along the Project Corridor by improving the overall function, efficiency, and flow. Improvements will reduce the typical "stop and go" movements associated with congestion and traffic service breakdown, thereby reducing the per-vehicle degradation inflicted on the road surface. The intersections' existing signal infrastructure will be improved to passive interchange and overpass controls, thereby reducing the type and extent of electronic signal equipment needed.

1 *National Roadway Safety Strategy. United States Department of Transportation.* https://www.transportation.gov/sites/dot.gov/files/2022-02/USDOT-National-Roadway-Safety-Strategy.pdf



When the US 169 Rural Safety and Mobility Interchange Project is completed, all roadway, pavement, and interchange components will be reconstructed to new condition. A new grade separated structure will carry vehicles over the CR 4 (current at-grade intersection) and new shared use paths will be built. These new features will result in annual maintenance costs decreasing for years to come as shown in the benefit-cost analysis section.

MnDOT's Pavement Management Unit is responsible for the collection and analysis of pavement condition on Minnesota's Trunk Highway system and County State Aid Highway (CSAH) system. As of 2022, the remaining service life (RSL) along the southbound lanes of US 169 were ranked as "medium", indicating a range of 4-11 years remaining. This is the only segment along the 20.7-mile stretch between Princeton (Highway 95) and Elk River (US 10) that currently does not rank in the "high" range (12+ years of service life remaining). Without securing FY 2023/2024 federal funding, the project will fall out of a state of good repair and may face delays which will push pavement condition into the "low" rating by the construction year (Year 2026).



we need to add an arrow showing where this project is.

Restores and Modernizes Existing Core Infrastructure

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 US highway and has dedicated funding available to ensure the roadway is properly maintained. MnDOT will operate and maintain the US 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.

Addresses Current and Projected Vulnerabilities

The Project addresses current and projected vulnerabilities that, if left unchecked, will threaten future transportation network efficiency, mobility of goods and people, and economic growth. Based on the current AADT volumes, population growth, future land uses, and forecasted traffic growth, it is projected that if the Project is not built, the outdated and inadequate sequence of intersection designs will increasingly degrade multimodal traffic along and across the Project Corridor to result in increasingly higher loss of life, quality of life, property, time, productivity, and economic value for the Project Corridor's diverse user base.

Poor roadway conditions add 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 have reported that their freight loads often shift or bounce along this segment, leading to damaged products and increased costs.

3. ECONOMIC IMPACTS, FREIGHT MOVEMENT, AND JOB CREATION

The Project will directly benefit local and regional employment and economic growth. The population of

Sherburne County continues to increase, and the Project will directly support vital local employment sectors. Sherburne County's population grew by 11.6 percent between 2010 and 2021 from 88,800 to 99,074, four percentage points higher than the projected statewide growth rate (7.6 percent).

The US 169 Rural Safety and Mobility Interchange Project contributes to the following outcomes:

Increases intermodal and/or multimodal freight mobility, especially for existing freight bottlenecks;

US 169 is a Critical Rural Freight Corridor and a part of the National Truck Network, extending north from the Twin Cities Metropolitan Area into Central Minnesota. Through Zimmerman, the roadway carries 3,950 trucks daily, which accounts for 14 percent of the total traffic volumes, exceeding typical truck percentages on most state highways. The traffic signal at the US 169 and CR 4 intersection (the last remaining traffic signal along a 75-mile stretch of highway) will be removed, allowing freight carriers to travel through a grade separated interchange. This interchange will improve travel times and eliminate traffic queues that are forecasted to reach 1.8 to 3.6 miles in length by Year 2045 in the no build scenario.

Commodities being hauled on US 169 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 that heavy commercial vehicle volumes would grow by 1.7 percent per year through 2034.[2] Without the project, these increased heavy commercial volumes will further intensify congestion and travel time reliability across this portion of US 169.

US 169 serves as a critical trucking route in Central Minnesota and is the most heavily used non-interstate highway freight corridor in Sherburne County.[3] According to 2020 counts, the road sees 3,950 heavy trucks per day, which is approximately 14 percent of total traffic.[4]

With the existing traffic volumes, the signalized intersection between US 169 and CR 4 limits freight mobility by creating timing, product quality, safety, and reliability issues for freight haulers. The congestion along this segment makes travel time unreliable, especially during peak hours, causing delays in freight delivery. According to the Federal Highway Administration, the trucking industry values transit travel time in the range of $25 – $200 per hour, and that delay costs are often passed on to consumers.[5] The project will improve freight movement efficiency along the US 169 corridor, reducing overall transit travel time.

Additionally, freight traffic along this section of US 169 is often forced to interact with unsafe pavement conditions, narrow lanes, inadequate shoulders, and crash related delays. Trucks are also met with inadequate turning radii when entering and exiting US 169 from CR 4. As the county grows over the coming years, these congestions issues will increase significantly, creating additional delays at the intersection.

Replacing the signalized intersection at US 169 and CR 4 with an interchange will allow freight to pass through the City of Zimmerman without stopping and, by alleviating problematic turning radii and installing on and off ramps, will allow large trucks to enter and exit US 169 at the CR 4 intersection more easily.

Improve multimodal transportation systems that incorporate affordable transportation options such as public transit to improve mobility of people and goods;

The construction of shared uses paths and wider roadway shoulders incorporated as part of this project allows pedestrians, bicyclists, rollers, and other non-driving residents within the City of Zimmerman an opportunity to walk or bike to their place of employment, school, or for recreational or exercise purposes.

Enhance recreational and tourism opportunities

US 169 carries recreational and tourism traffic and serves as a direct route to many outdoor opportunities including

2 *Central Minnesota Freight Study. Minnesota Department of Transportation. https://www.dot.state.mn.us/ofrw/freight/PDF/CentralMinnesotaFreightStudy.pdf*

3 *District 3 Freight Plan. Minnesota Department of Transportation. January 2020. https://www.dot.state.mn.us/ofrw/freight/PDF/d3plan/freight-plan.pdf*

4 *Traffic Mapping Application. Minnesota Department of Transportation. https://www.dot.state.mn.us/traffic/data/tma.html*

5 *Traffic Congestion and Reliability: Trends and Advanced Strategies for Congestion Mitigation. US Federal Highway Administration. https://ops.fhwa.dot.gov/congestion_report/chapter2.htm*

the 30,700 acre Sherburne National Wildlife Refuge located just west of the project location. Within three miles of the US 169/CR 4 interchange, there are several other natural wildlife areas and lakes including Lake Fremont, Cantlin Lake, Fremont Wildlife Management Area, and Uncas Dunes Scientific and Natural Area. New and safe transportation infrastructure benefits these recreation users.

Commuting Corridor

US 169 also serves as a key link between rural communities in Sherburne County and job opportunities in the Twin Cities Metropolitan Area. As the primary principal north/south arterial roadway through rural Sherburne County, residents depend on US 169 as a safe and reliable transportation option for a variety of multimodal transportation types.

On average, Zimmerman and Sherburne County residents spend more time commuting to their place of employment than the state average. Zimmerman residents commute 37 minutes to their place of employment, Sherburne County residents commute 32 minutes, whereas Minnesota residents commute only 24 minutes.[6]

Most employed City of Zimmerman and Sherburne County residents commute outside of the city or county to access their place of employment. Specifically, 94 percent (2,736 people) of employed Zimmerman residents commute outside of the city for employment, while only 6 percent (169 people) live and work in Zimmerman. Approximately 79 percent (37,759) of Sherburne County's employed residents work outside the county.

Table 2 Table 2. Commuting Patterns, City of Zimmerman and Sherburne County, 2019

	City of Zimmerman		Sherburne County	
	Count	Percent	Count	Percent
Work in the Area	1,312	100%	23,748	100%
Commute into the Area	1,143	87%	13,784	58%
Live and Work in the Area	169	13%	9,964	42%
Live in the Area	2,905	100%	47,723	100%
Commute out of the Area	2,736	94%	37,759	79%
Live and Work in the Area	169	6%	9,964	21%

Source: OnTheMap.ces.census.gov

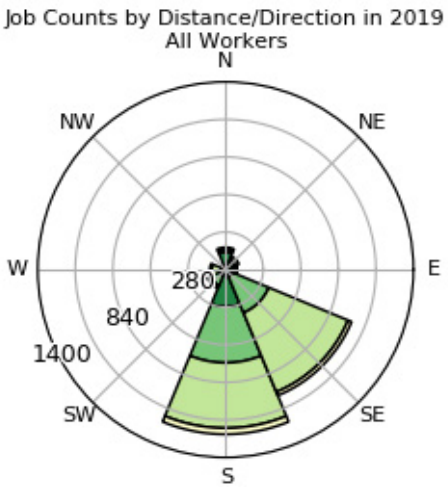


Figure 2 Distance and Direction of travel for Zimmerman Commuters, 2019

Most people who commute out of Zimmerman and Sherburne County travel south to access their place of employment (see Figure 2). Those commuters are dependent on the function of US 169 to access job opportunities. The US 169/CR 4 interchange project will improve access to employment for residents of the City of Zimmerman and Sherburne County by allowing them to access US 169 more easily and safely. It will also reduce travel time reliability for those commuters by creating better traffic flow. These improvements will result in a reduction of commuting time for Sherburne County residents and provide a more safe and efficient connection to the major employment hubs in the Minneapolis/St. Paul metro area.

6 *American Community Survey 2021 5-year Estimates. US Census Bureau.* https://data.census.gov/cedsci/

Commercial Development Access

The uncertain future of the intersection and poor access limit the potential sale and development of commercial property along US 169 in the City of Zimmerman. The US 169/CR 4 intersection is located within the City's Development District No. 1 and provides access to seven Tax Increment Financing Districts (TIF).[7] An efficient road network and access to US 169 would support Sherburne County's economic vitality for existing commerce and planned commercial and industrial growth. The US 169/CR 4 interchange project will provide controlled and safe access on and off US 169 and will support future development of approximately 140 acres of commercially zoned land that is adjacent to the highway. This will result in high paying job creation and opportunities for residents in the City of Zimmerman, Sherburne County, and surrounding counties.

4. CLIMATE CHANGE, RESILIENCY, AND THE ENVIRONMENT

Environmental and Air Quality Impacts: Changes in emissions are expected to be impacted by the time vehicles spend idling at each of the project intersections. The change in intersection delay between No Build and Build conditions was obtained from travel time analysis and converted to equivalents of vehicle-miles traveled (VMT) by applying fuel consumption for idling vehicles to average miles per gallon for passenger cars. The change in VMT equivalents was then applied to emission rates by vehicle type. Average emission rates per vehicle type were obtained from the Environmental Protection Agency's Motor Vehicle Emission Simulator (MOVES) version 3. Emission rates per vehicle type are provided in the attached BCA Workbook. Total change in emissions was valued in accordance with the Benefit Cost Analysis Guidance for Discretionary Grant Programs, dated January 2023. Please refer to the project's BCA Workbook and BCA Memo for further details.

Table 3 Pollution Emission by Mode (g/VMT)

Mode	NOX	SO2	PM2.5	CO2
Automobile	0.2279	0.0021	0.0058	317.2247
Trucks	2.0995	0.0048	0.0325	1238.7316

Table 4 Table 4 – CO2, and Other Emissions Cost Savings (Years 2025-2054)

Mode	CO2*	NOX / SO2 #	Total #
Total	**$288,169**	**$85,756**	**$373,925**

* 3 percent discount # 7 percent discount

5. EQUITY, MULTIMODAL OPTIONS, AND QUALITY OF LIFE

According to the USDOT Equitable Transportation Community (ETC) Explorer tool, at the National level, Census Tracts 27141030106 and 27141030104 have overall disadvantage component scores (percentile) of 94 percent and 86 percent respectively for transportation insecurity. At the County and City level and within Minnesota, Sherburne County ranks in the 82nd percentile, and the City of Zimmerman shows an 87 percentile ranking for transportation insecurity. Lack of pedestrian and bicycle infrastructure, and limited transit options are key drivers of this score. According to the Climate and Economic Justice Screening Tool, the project is not located in a Justice40 Census Tract.

Quality of Life

The Project supports quality of life for those living in the area and who pass through Zimmerman on a regular basis. It will contribute to regional and multimodal connectivity by providing alternate safe transportation choices for all people and improving the efficiency of the roadway. The Project provides pedestrian, bicycle, automobile, and freight enhancements that will benefit all members of the surrounding communities, including low-income populations, people of color, children, people with disabilities, older adults, and people without access to vehicles. The US 169/CR 4 interchange project provides safe access to Sherburne National Wildlife Refuge, and Sand Dunes State Forest, completes a connection in the regional trail network, reduces congestion along US 169, and further implements County initiatives to extend fiber optic internet to the rural area.

7 *Redevelopment District No. 1. City of Zimmerman.* https://zimmerman.govoffice.com/vertical/sites/%7BE3C534B1-3B55-4FDD-B367-44985F320A41%7D/uploads/%7BB7C17EEF-D2A3-4F60-B383-3B51B20DD97B%7D.PDF

Bike and Pedestrian Improvements

Pedestrians and bicyclists need to travel through a four-stage crossing to cross US 169. The proposed project provides trail/sidewalk facilities under the US 169 bridge.

The existing US 169/CR 4 intersection lacks trail and sidewalk facilities, which limits opportunities for Zimmerman residents to walk and bicycle. With the existing infrastructure, crossing US 169 is dangerous and difficult to navigate, especially for children and people with limited mobility. The current pedestrian facilities are limited to a four-stage crossing across US 169 on the north side of CR 4, with no sidewalk or trail facilities on the east side of US 169. The lack of safe pedestrian and bicycle facilities make Zimmerman residents dependent on cars for transportation and do not give residents the option to use non-motorized transportation modes.

The US 169 Rural Safety and Mobility Interchange Project will incorporate a variety of multimodal transportation improvements that will work to increase active transportation usage and reduce vehicle dependence. In particular, the project includes a dedicated shared use path/sidewalk facility along both the north and south sides of CR 4 that crosses under the US 169 bridge. After completion, bicyclists and pedestrians will have access to dedicated crossings that will greatly reduce potential areas of conflict between pedestrians and bicyclists and vehicles, providing an overall safety benefit for all users.

Further, the CR 4 improvements 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 across US 169 will connect Lake Fremont and Grams Park, a 114-acre regional park, to Zimmerman's downtown and the regional trail network. The proposed trail crossing will directly tie into the Great Northern Trail, significantly expanding access to regional trail facilities for residents of the City of Zimmerman and the surrounding rural communities.

In addition to safety benefits, trail facilities promote healthy lifestyles for people of all ages and backgrounds by providing easy access to safe, reliable infrastructure where they can recreate and exercise. Well-maintained and accessible systems are key elements of strong, safe, family-friendly communities and help to define community identity and appeal.

> "The built environment influences physical activity levels by contributing to safety and convenience of walking and bicycling. Poor accessibility contributes to sedentary behaviors that are associated with poor health outcomes such as obesity, diabetes, and cardiovascular disease."[8]

Improved Travel Time Reliability

US 169 serves as a Critical Rural Freight Corridor on the National Highway System and serves to connect Central Minnesota with the Twin Cities metropolitan area. It is a north/south US route out of the Twin Cities, serving numerous smaller communities, including the Mille Lacs Reservation (population 4,618), and the cities of Elk River (population 25,835), Zimmerman (population 5,228), Princeton (population 4,819), Milaca (population 2,946), and others. Many residents of Sherburne County and beyond depend on the efficient function of US 169 to access job opportunities, healthcare, schools, recreation opportunities, places of worship, and everyday necessities.

8 *Use of Federal Funds for Bicycle and Pedestrian Efforts. US Department of Transportation.* https://www.transportation.gov/mission/health/use-federal-funds-bicycle-pedestrian-efforts

The existing signalized intersection at US 169/CR 4 creates major congestion and travel time reliability issues. It is common for mile-long backups to occur at the intersection during peak travel times, drastically slowing the flow of regional traffic that is passing through the City of Zimmerman. Congestion also limits and prevents easy access in and out of Zimmerman using US 169, the primary highway serving the community. Research has shown that traffic congestion negatively affects quality of life at both the household and regional level. "Households have both financial budgets and what is termed 'time budgets' that are both impacted by congestion. As vehicle operating and maintenance costs increase with rising congestion, the budget for some types of activities or expenditures decreases. The perceived 'quality of life' of a neighborhood is diminished as well, when the safety, reliability and the convenience of the transportation system decreases." [9]

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.

The US 169/CR 4 signal is the only remaining traffic signal on US 169 between the City of Rodgers and Lake Mille Lacs. According to the FHWA, intermittent disruptions of traffic flow by traffic control devices, such as the US 169 and CR 4 signal, can contribute to congestion and travel time variability even without the occurrence of a traffic influencing event (e.g. crash).[10] The signalized intersection frequently creates reliability issues along US 169. Completion of this project will result in the full 75-mile corridor being signal free, allowing traffic to flow more freely. Removal of the traffic signal will reduce time spent idling, traffic delays, and emissions by allowing vehicles to move through the interchange more efficiently without stopping and accelerating. Installation of the interchange will also provide residents of Zimmerman easier and safer access to US 169.

6. INNOVATION AREAS: TECHNOLOGY, PROJECT DELIVERY, AND FINANCING

Innovative Technology

On July 29, 2022, the Minnesota Department of Transportation developed the Minnesota Electric Vehicle Infrastructure (MEVI) Plan. Due to the Regional and National Importance of US 169, the Plan identified this highway as a potential future network route. The US 169 Rural Safety and Mobility Interchange Project advances and enhances the highway for electric, connected, and automated vehicles.

9 *Traffic Congestion and Reliability: Trends and Advanced Strategies for Congestion Mitigation. US Federal Highway Administration.* https://ops.fhwa.dot.gov/congestion_report/chapter2.htm
10 *Ibid.*

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 collect and share information such as travel times, alternate routes, and incidents. These enhance driver awareness and allow drivers to make informed decisions while traveling. They can also be used for incident management purposes such as identifying crashes, detecting queued traffic, and emergency response.

The US 169/CR 4 interchange project will explore the 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, congestion is reduced, and safety is improved when an incident occurs or in the event of poor road or weather conditions.

Fiber Optic Conduit Installation

Since 2018, 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 program allows the County 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. These efforts will be continued as a part of the US 169/CR 4 interchange project and will further goals to expand the communications network throughout the county.

Innovative Project Delivery

Civil Information Management (CIM) Software

During public engagement of this project, project designers used innovative Civil Information Management (CIM) software. The software uses embedded 3D visualization to allow designers to visualize impacts while completing preliminary modeling. This allows stakeholders and partners to better understand impacts and make more informed decisions about the corridor.

The US 169/CR 4 interchange project will continue to utilize CIM software to model and visualize the project and provide increased transparency for the public. Transparency will enable owners, consultants, contractors, and stakeholders to work together to identify and complete design adjustments to ensure the best alternatives. This enables effective conflict detection, rapid design review, and will reduce project timelines and overall costs.

Best Value Procurement

Since 2007, public agencies in Minnesota have been 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 which will help the Project deliver long-term benefits on an efficient schedule and budget. Sherburne County has participated in projects that have utilized the best value procurement process and will consider applying this procurement process for this Project.

Construction Manager/General Contractor Procurement

As the project sponsor, Sherburne County will lead the procurement process for the US 169/CR 4 interchange project. The County intends to utilize a Construction Manager/General Contractor (CM/GC) approach. Through the CM/GC 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 has been found to expedite design, reduce construction time, and limit project risks.

CM/GC has been utilized to complete the design and construction for other projects along US 169, including for interchange projects in the City of Elk River. Sherburne County and MnDOT are experienced with this approach and have found it to be successful in enhancing designer-contractor collaboration, reducing project costs, and optimizing the project schedule. CM/GC has been identified by the FHWA

Center for Accelerating Innovation as an Every Day Counts initiative for accelerating project delivery.11

Accelerated Bridge Construction

MnDOT has specifically identified the US 169/CR 4 interchange as a suitable candidate to employ Accelerated Bridge Construction (ABC) technologies to expedite construction. ABC techniques could be used to construct the CR 4 bridge over US 169 while minimizing traffic delays, road closures, and potentially reducing project costs.

Implementing ABC methods presents unique challenges and opportunities. The advantages vary by project and location but can result in increased safety, less traffic disruption, higher bridge quality, fewer environmental impacts, and increased infrastructure value. Possible ABC techniques for the CR 4 bridge include:

- Slide-In Bridge Construction (SIBC) – To use SIBC, the bridge is constructed on temporary supports. Once complete, it is slid into place, tied into the approaches, and paved within 48-72 hours.
- Prefabricated Bridge Elements and Systems (PBES) – PBES utilizes non-traditional items such as full-depth bridge decks, prefabricated bridge deck pieces, and beam units which allow for expedited construction timelines and save the projects several months of construction time and cost. [12]

Innovative Financing

In 2018, the Sherburne County Board of Commissioners approved resolutions to implement a 0.5 percent sales tax to create a new, dedicated, non-federal transportation fund. Since its adoption, this funding source has generated approximately $6.5 million in tax revenue per year to fund specific high-priority transportation projects, including the US 169/CR 4 interchange project. This dedicated transportation funding source will allow the County to provide a local match to state and federal funding for critical infrastructure projects.

In addition, the County has secured $7 million in Federal Congressionally Directed Funding from Senator Klobuchar, Senator Smith, and Representative Emmer, with bipartisan support.

An MPDG grant award will fill a funding gap and enable the County to leverage existing non-federal and Federal funding to implement all safety and mobility improvements.

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

12 *FHWA Center for Accelerating Innovation. Accelerated Bridge Construction.* https://www.fhwa.dot.gov/innovation/everydaycounts/edc-2/abc.cfm