



## MERIT CRITERIA

### Safety

Completion of the project is critical to improving safety for both motorized and non-motorized travelers across Cass County. The Project was originally identified in the 2016 Cass County Local Road Safety Plan, Appendix Page 1. To review the entire Cass County Plan as referenced, please go to [www.casscountynod.gov/raisegrant](http://www.casscountynod.gov/raisegrant). Safety Benefits include:

**Crash Reduction.** According to FHWA, changing shoulder width from 2 feet to 6 feet can reduce crash probability on a 2-lane road by 25 percent. A shoulder present on a two-lane road will increase safety and better accommodate motorists, non-motorized travelers, and emergency services. Additionally, the Project includes installation of rumble strips on the newly constructed shoulders.

**Flood Mitigation.** The Project will decrease localized flooding along Cass County Highways 4 and 10 via slope-flattening and culvert replacement. The Project will address specific problem areas that have seen localized flooding which currently require detours and leave area residents unable to utilize the roadway. The detour route increases mileage from 6 miles to 10.5 miles and increases travel time from 8 minutes to 11 minutes.

**Pedestrian Safety.** The Project will decrease vehicle-pedestrian accidents and offer safer travel for non-motorists along Highway 4 and Highway 10. While pedestrian traffic is not common in this area, widened roads with established shoulders will allow pedestrians and bicyclists safer access and greater mobility than the current narrow roadway with no shoulders.

Cass County data indicates that motorized traffic is traveling at much higher speeds than the posted speed limit. Several nearby highways have a posted speed limit of 55 MPH while Highway 4 has a posted speed limit of 65. The increased safety risk of the higher speed limit is exacerbated by safety concerns posed by the lack of shoulder and deterioration of the pavement in the Project area. The county has implemented safety improvements in the past to address similar safety issues. Examples of these countermeasures include flashing signals on stop and stop ahead signs, rumble strips, and improved signage. These systemic safety improvements





have reduced crashes over the measured 12-year period when comparing the six years before the safety improvements were implemented (2013) to the 6 years after. From 2008–2013 there were 447 total crashes in the county. From 2014–2019 the average went down to 324; a 27 percent decrease in crashes following implementation of safety measures.

There were 7 crashes, including 2 fatalities in the Project area between 2018-2022. All but 1 of these occurred at the intersection of Cass County Highway 4 and Highway 18. Due to the severity of safety concerns at this intersection, the Project includes construction of a left-turn lane at this intersection. According to NDDOT, this intersection meets criteria for a designated turn-lane as there have been more than 2 crashes in 3 years.

Safety concerns related specifically to the intersections between state and county highways are called out in the Cass County Local Road Safety Plan. Through a partnership with North Dakota Department of Transportation, Cass County has prioritized safety countermeasures at these intersections to include streetlight evaluation, improved and updated signage, pavement markings, and dynamic warning signs.

The Project also seeks to address safety concerns approaching the town of Buffalo from the east. Currently, there is no available parking near the cemetery as you enter town, (**FIGURE 5** on page 8). The Project seeks to create a designated parking area, with added parking and striped lanes as well as wider shoulders approaching the cemetery. ADA curb ramps will also be installed, replacing the current pavement to sidewalk connection which is not ADA compliant. Upon completion, motorists and non-motorists alike will have a safer entrance to and expanded mobility throughout the town of Buffalo.

## Protecting Non-Motorized Travelers

The Project will improve safety and connectivity for non-motorized travelers by reducing transportation barriers that are most acutely impacted by changes in distance traveled and delays. Shoulder expansion/addition will better accommodate pedestrians and non-motorists and better protect them from health and safety risks, reducing the potential for fatalities and/or serious injuries due to vehicle/pedestrian collisions.

It is also important to note that Cass County is a member of the NDDOT Vision Zero partnership and was awarded the NDDOT’s inaugural Vision Zero Safety Program Award in 2019. This is a testament to the commitment toward transportation safety and accessibility that Cass County demonstrates with every project.



As a proposed SAFETY measure, Cass County intends to install dynamic warning signs and electronic speed signs to address speed-related and run-off the road crashes





# 2023 Highway 4 & Highway 10 Roadway Improvement Project

CASS COUNTY, NORTH DAKOTA

Figure 2. Typical Section for Highway 4 and Highway 10

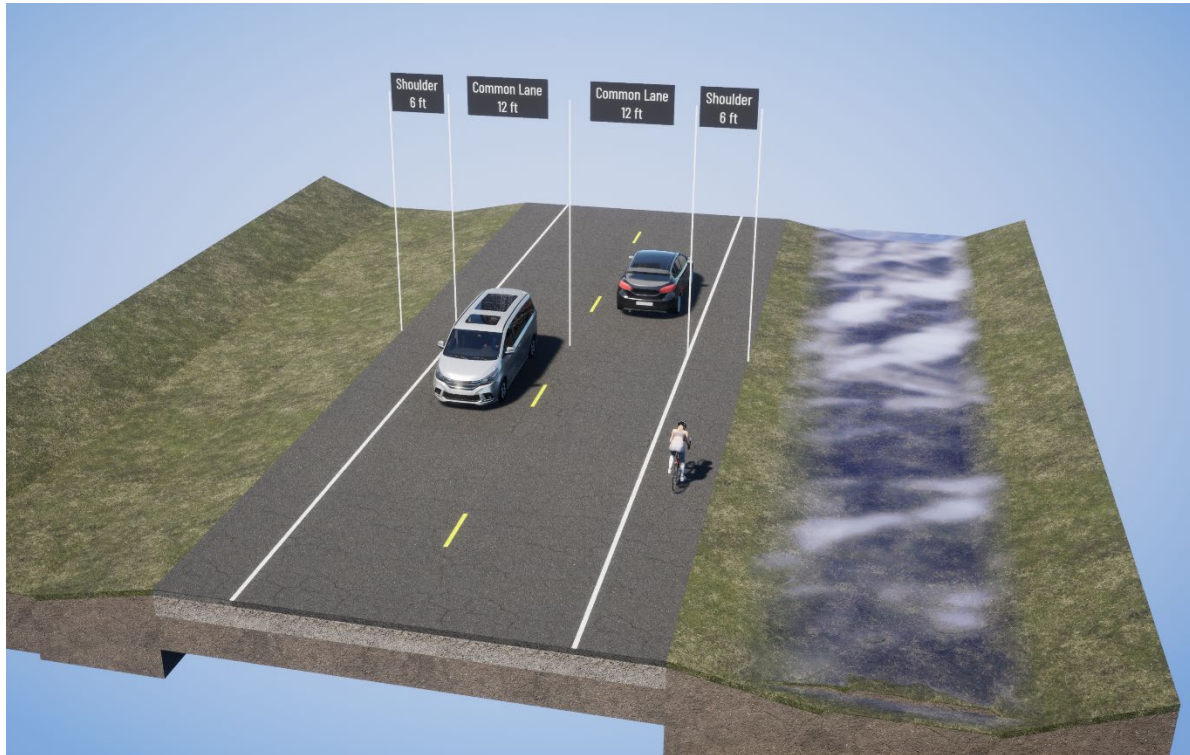


Figure 3. Typical Section for Highway 10 through Buffalo





## Environmental Sustainability

The Project incorporates several elements that address environmental benefits including:

**Reduction in traffic delays.** Roadway improvements that address pavement deterioration and current roadway flooding will impact energy/fuel consumption through reduction in travel delays/detours. Additionally, inclusion of infrastructure improvements that address the needs of non-motorized travelers serve to remedy disproportionate negative environmental impacts on members of disadvantaged communities through incorporation of efficient transportation design and inclusion of pathway/pedestrian connectivity.

**Flood Mitigation.** Completion of the Project will reduce delays and detours related to current roadway flooding. Reconstruction and proper sloping along County Highway 4 and Highway 10 will eliminate current roadway over-topping by flood waters, reducing or eliminating the need for road closure and related detours, more reliability for motorists, and less “idling” on the roadway.

**Increased Resiliency.** The Project incorporates several environmentally sustainable practices and materials that provide benefit to the Project area as well as reduce negative environmental impacts and burden. Examples of this include asphalt recycling and culvert replacement that repairs currently deteriorating culvert areas/ditches and allow for appropriate flow of water and sustainability of habitats.

### *Delay/Detour Reductions = Pollutant Reductions*

The Project seeks to address the delays and detours incurred by flooding and washouts along County Highways 4 and 10. The Project will mitigate future flooding through the reconstruction of culverts as well as raising the base level of the road in areas where washouts have historically occurred. Completion of the Project will result in environmental benefits including reduced emissions and pollutants related to reduction of detours and road closures as well as idling vehicles on the roadways



### *Fighting Climate Change*

According to a September 2021 Report published by the Environmental Protection Agency (EPA), climate change will cause the most severe harm disproportionately on underserved communities such as those with lower incomes, less education, racial minorities, and those of very young or advanced age. The Project proactively addresses the imminent impacts of increasing rainfall resulting from climate change. Targeted improvements to the roadway and



select water run off areas will help deter flooding and increase the resilience of the existing infrastructure to help withstand future extreme weather events and natural disasters. Reconstruction of the roadway to include more weather resistant and resilient materials will also result in less maintenance costs and future disturbance to the area.

### *Sustainable Practices*

Cass County has identified several areas where sustainable, environmentally friendly materials and practices can be utilized. One practice the County is considering is the reuse of asphalt for the new repaving process, also known as Reclaimed Asphalt Pavement (RAP). FHWA cites this utilization as having great economic and environmental benefits while maintaining the strength and quality of the pavement. The county will also seek to include lower-carbon pavement and construction materials. The environmental benefits these materials provide far outweigh the cost while providing equal performance and sustainability.

The County is also considering a reconstruction technique that takes the current top layer of asphalt (1–2"), mills off the rest, and sends it to be recycled for the new asphalt being installed. This process typically results in a return of 20 percent of the total weight of asphalt recycled. This practice is both economically efficient and environmentally friendly, resulting in cost and time savings.

The Project also includes establishing a nearby pit for recycled asphalt and gravel storage for retrieval during construction. This storage pit would be near the project area, which would significantly reduce travel time and related carbon emissions during construction (a breakdown of these savings is included in the *Innovation* section). The Project also includes the reconstruction of several culverts. These culverts are nearing the end of



Example of flooding damage on Highway 4



Example of flooding along Highway 10



their useful life. Reconstruction provides numerous benefits, including added resiliency and lifespan to the culverts, reduction in flooding, and rehabilitation of habitat and migration channels for local aquatic species. Modification of ditch sloping and depth that correspond with the reconstruction of the road and the replacing of deteriorating culverts will help prevent stormwater runoff that creates localized floods as well as providing better containment space preserving local habitat.

Lastly, with the recent influx of federal dollars to States for development of EV Charging Infrastructure, there will be several opportunities for counties and cities to begin planning for eventual EV Charging Station installation in more rural areas. Cass County is eager to collaborate with state and federal agencies to determine where this infrastructure can be best utilized, including within the proposed Project area.

## Quality of Life

Reduction in traffic delays and detours due to flooding and roadway deterioration will result in improvement to the social and environmental quality of life, reducing transportation barriers and acting as a catalyst to community and population connection. Quality of Life Benefits include:

**Non-motorized traveler improvements.** The Project includes improvements that positively impact safety and connectivity by reducing transportation barriers for non-motorized travelers (bicyclists/pedestrians) who are most acutely affected by changes in distance traveled and delays. Most noticeably impacted is pedestrian and cyclist movement near the town of Buffalo.

**Universal access.** One of the major problems posed by flooding in the Project area is that it directly affects those with homes along Highways 4 and 10. Several residents have been stuck in their homes, with either a flooded driveway or washed-out entrance onto the highway. The Project addresses these problem areas through the widening and deepening of surrounding ditches, raising the roadbed in areas of washouts, and maintenance or full replacement of deteriorating culverts.

**Enhancing unique community characteristics.** In addition to providing motorized vehicle safety benefits, the project will enhance safety for bicycle and pedestrian traffic throughout Cass County. The proposed shoulder enhancements seek to connect communities, providing better mobility and access to non-motorized travelers. Connecting remote communities to rural growth centers, such as Buffalo and Tower City, creates a more inclusive community and allows access to essential services for residents who live in extremely remote areas of the state.

As noted in the figures on *PAGE 8*, the Project area serves as a main connecting point to many nearby businesses, neighborhoods, and communities. The Project area serves as the east to west connection for Brewer Lake County Park, a popular summer destination for locals and tourists. It also connects to the town of Buffalo, which for many residents within and around the Project area, is the main destination for essential services and goods. Completion of the Project would allow residents safer and more consistent access to essential goods and services via both vehicle and non-motorized travel.



The Project also establishes a connection between existing pathways and would allow for safer and more direct travel throughout the County. Valley Senior Services, an elderly care service, provides transportation in rural Cass County to access essential services such as groceries and doctors' appointments. This form of community transit is vital, and completion of the Project would allow public transit services to continue operating without restriction or delays related to roadway flooding hazards.

The Project also proactively addresses equity issues within the County and surrounding areas. Statistics have shown that transportation related safety concerns disproportionately affect disadvantaged communities. Project completion would solidify the connection between the most rural parts of Cass County and the nearby towns and business centers. As noted in the 2018 Cass County Transportation Plan, Buffalo and Tower City are Rural Growth Centers. Improved connectivity to these communities will afford people the opportunity to work and live outside the community centers, while still maintaining safe and consistent access to essential goods and services. Please refer to **FIGURE 4. TOWER CITY POINTS OF INTEREST** and **FIGURE 5. BUFFALO POINTS OF INTEREST**.



# 2023 Highway 4 & Highway 10 Roadway Improvement Project

CASS COUNTY, NORTH DAKOTA

Figure 4. Tower City Points of Interest

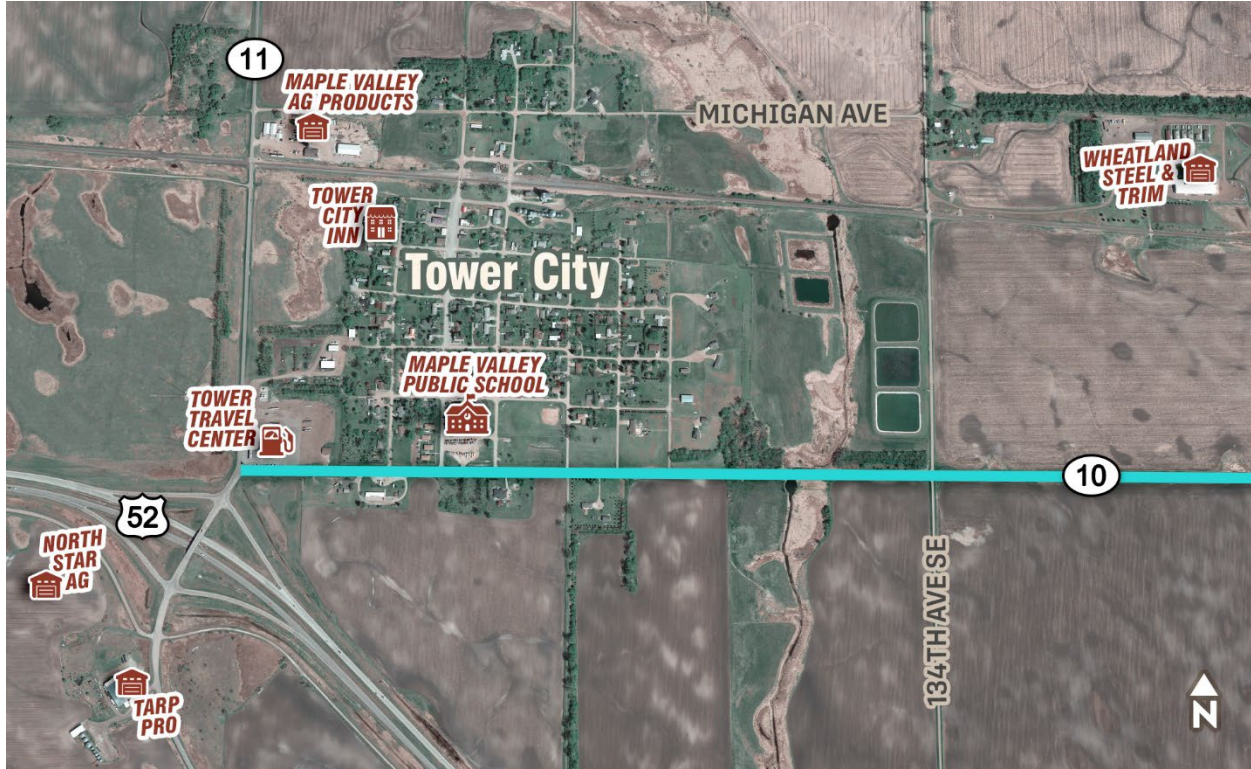
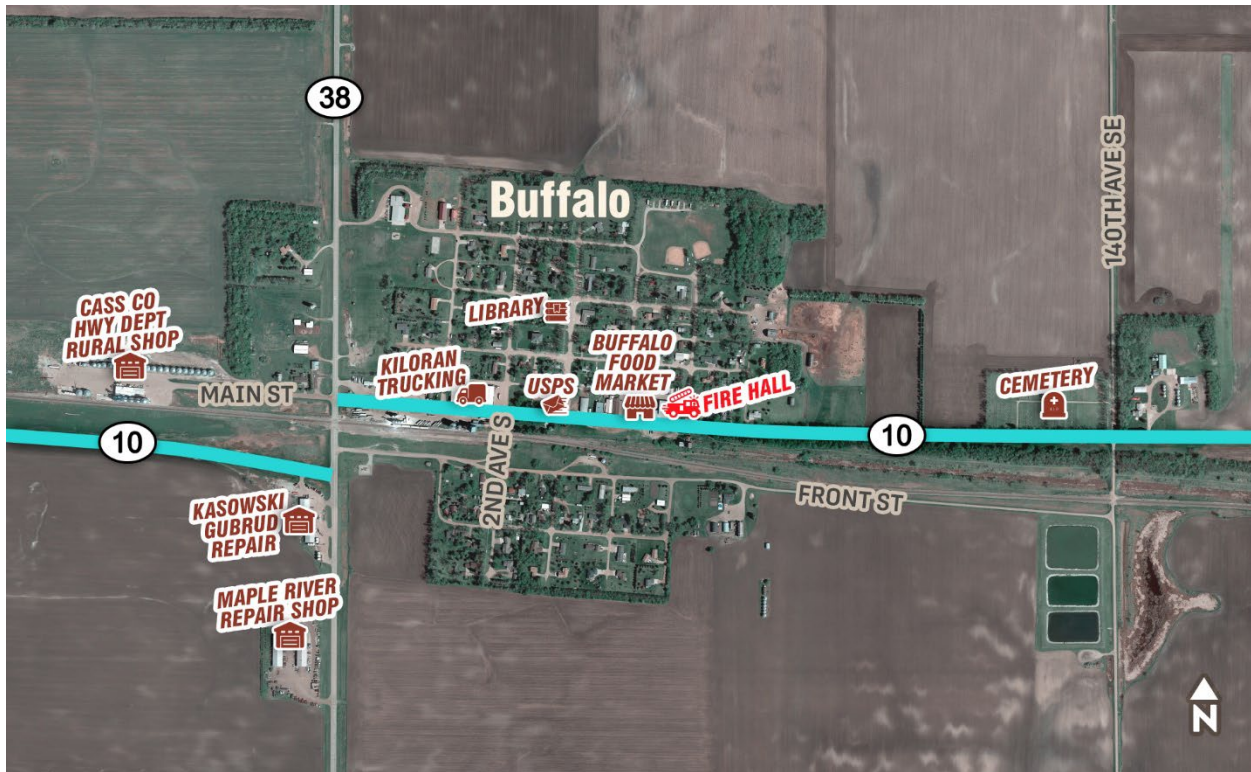


Figure 5. Buffalo Points of Interest







## Improves Mobility and Community Connectivity

Cass County recognizes the need for diverse transportation options that cater to all who work, live and travel within the Project area. The goal of the Project is to improve mobility and increase dependability along Cass County Highways 4 and 10. This is achieved through the repaving and reconstruction of Project roads to include a 6-foot shoulder, offering non-motorists and pedestrians a safer means of travel. The Project addresses mobility and connectivity through:

- Safer and more reliable roads with reduced or eliminated events of flooding/closure that currently results in detours or delays in travel on the existing roadway,
- Increased safety and opportunity for non-motorized travelers via access to new shoulders and sidewalks,
- Improved connectivity to nearby major roadways and destinations including communities that provide essential goods and services to rural residents.

Improved connection to nearby communities and major roadways is one of the greatest Project benefits. Kiloran Trucking and Brokerage, one of the largest employers in the community of Buffalo, acts as a final mile distributor, helping freight reach the most rural destinations of North Dakota. The increased connectivity and reliability of freight routes provided by the Project would be of great benefit to local residents and employees of the company traveling throughout the area.

FHWA notes that improving roadways and pathways is one of the most effective tools at removing and decreasing physical barriers for disadvantaged communities. In addition to physical barriers, the Project addresses tangible benefits such as decrease in travel and delay time which disproportionately affect non-motorists and those who rely on alternative forms of transportation. The improved roadway would also benefit those transportation services such as Valley Senior Services, who rely on direct routes and community connectivity to allow their passengers and ride share users the ability to shop and access essential services.

Cass County has built a robust Public Engagement plan as part of the Project. As the Project has not yet been fully designed/developed, formal public engagement has been limited to date. The public engagement plan developed by the County seeks to gather as much community input in the early stages of the Project as possible, utilizing several different strategies and approaches. The plan is explained further in the partnership and collaboration segment and can also be found on the Project website at [www.casscountynd.gov/raisegrant](http://www.casscountynd.gov/raisegrant). The County also recognizes NDDOT's 'Public and Non-Metropolitan Local Official Participation Plan for Statewide Planning and Programming Activities' and will continue to reference and utilize it as guidance for public engagement moving forward..

## Economic Competitiveness and Opportunity

Providing the ability to travel from one location to another safely with minimal delay and with safe motorized and non-motorized travel options will improve the long-term reliability and cost-competitiveness of the movement of goods and people. Benefits include:



**Community Reinvestment.** The Project will mitigate detours and delays along the Project route. This has been identified as a key component for revitalizing investment opportunities and economic growth that increases economic productivity of land, capital and labor, expanding the opportunity for high-quality, good-paying jobs in the community and the region.

**Productivity.** The Project will improve the ability to travel from one location to another safely and with minimal delay, increasing reliability of the transportation network for workers and businesses.

As noted in the Cass County Transportation Plan, Tower City and the City of Buffalo are both considered Rural Growth Centers. The County has identified these cities for their location, access to essential services, and economic value. As more emphasis is placed on infrastructure improvement in the county, these cities will see continued growth. The Plan also identifies both County Highway 4 and County Highway 10 as *Regionally Significant County Roadways*. Identified Project routes serve as essential roadways for much of the County. They are also considered essential alternative routes for both I-29 and I-94. These roads are vital to the local and regional economy. The Project serves to bolster the growth and economic competitiveness of the communities it serves.

Completion of the Project will provide several economic benefits to Cass County and the surrounding areas. Large scale job-providers such as North Dakota Soybean Processors, Tharaldson Ethanol, and others rely on the local roadways for both transportation of goods and mobility of employees. The reconstruction of Highway 10 near Tower City will provide an alternate route for farmers, workers, and travelers to utilize. The Project will allow people to the North and to the East of these businesses a more direct, safe route to and from work. It also provides a reliable route for freight mobility alternative to the highway.

The Project will also provide significant economic benefit to the city of Buffalo. Currently there is limited parking and roadway as you enter Buffalo. Included in the Project is the addition of proper parking on the east side of town, complete with striping and sidewalk setbacks. The roadway will also be widened to accommodate both a new shoulder and ADA curb ramps. The current road is 24 feet wide with no shoulder and is simply pavement abutting sidewalk. The new roadway and sidewalk delineation will allow for better mobility of tourists and community members while also accommodating motorists with established parking and ensuring compliance with ADA guidelines.

In addition to reconstruction that alleviates roadway safety concerns, the Project will rehabilitate, reconstruct, and upgrade highway and stormwater infrastructure that will support future economic growth and stability. Cass County functions as the growth center for the Southeastern North Dakota region. Doing nothing with the current road conditions compromises and diminishes other state of good repair projects already completed and those planned in the future. Failure to address the existing issues will limit freight movement on a critical element of the County Highway System and will negatively impact the area's ability to sustain the economy or promote private investment and related economic growth.



## State of Good Repair

The Project is critical to local, regional, and state plans that address transportation infrastructure and state of good repair. It serves as a centerpiece for future state of good repair efforts initiated by Cass County. Benefits include:

**State of Good Repair Benefits.** The Project seeks to eliminate future flooding along Highway 4 and Highway 10. Through sloping, culvert repair, and roadbed heightening the Project will address the current problem of flooding in the area. In addition to making the roadway safer, this will also reduce future maintenance costs related to asphalt and roadway deterioration related to repeated water over-topping of the roadway.

**Construction and Maintenance Efficiency.** Project construction will incorporate several efficiency measures that provide the most immediate benefit to the roadway and will also reduce maintenance time and costs into the future. The County is evaluating the use of recycled asphalt and other construction techniques and materials that will be best maintained in the harsh weather conditions in the area, creating resiliency and reduced maintenance needs and costs moving forward.

The Project addresses several current and projected vulnerabilities across Cass County. Construction incorporates several design elements that will both restore and modernize the existing infrastructure. The inclusion of RAP (Reclaimed Asphalt Pavement) along with the concept of perpetual pavement will enhance the existing structure while also modernizing it and reducing future maintenance. The use of RAP, as well as recycled top layer, will also allow for an efficient use of materials and time during the construction phase.

Another element of the Project being considered is the stabilization of the subgrade utilizing cement for the entire width of the top paved surface. This innovative design reduces the aggregate and asphalt depths needed to carry the projected traffic volume, resulting in less maintenance and reduced down time during construction.

Project completion will also mitigate the potential for flooding and washouts into the future. Currently there are several residential sections on Highway 4 that experience localized flooding, and one section on Highway 10 near the Maple River that experiences washouts that last for several days at a time. Design and construction account for these challenges and address them in the most efficient way to reduce the need for water damage repair and replacement well into the future.

Cass County is responsible for maintenance and state of good repair for the Project area. The Project area will be maintained via chip seal, crack seal, and overlay on a regular basis. These maintenance procedures are currently in place, and the county has the capacity to maintain the road effectively into the future.



## Partnership and Collaboration

The Project is a culmination of efforts by the county to improve mobility and connectivity. Historically, the county has held several meetings each year to update local officials and the public on upcoming project opportunities. Each spring and fall, a meeting is hosted by the county for local township officials. These meetings are scheduled by the township, and all county officials are invited to speak on behalf of their departments (i.e., County Engineer, Sheriff, Finance Director, Parks Dept. Lead, etc.) These meetings function as a way for the county to share their long-term goals with the local communities while also soliciting any advice, objections, and project ideas. The County also meets with a Road Advisory Committee 3 times a year. These meetings consist of road evaluations and project prioritization both for the county and the individual municipalities represented.

The County also held individual meetings with local communities when developing their 2023 Comprehensive Highways and Bridges 5-Year Plan. They met with Buffalo, Tower City, and others to solicit their input and receive feedback. These meetings allowed for local community members to advocate specifically for their community as they look ahead 5 years and envision what infrastructure upgrades are most necessary and what safety issues are most imminent. The County also holds meetings for any project involving Right of Way. Attendees are typically adjacent landowners, though all are welcome. These meetings are held to discuss local impact with those most directly affected.

The County has also done outreach with local schools on several transportation safety efforts. They partnered with several schools regarding the inclusion of flashing beacons for school zones. They met with the schools and assessed the safety concerns and pinpointed the areas of need before installing beacons. They also partnered with the state of North Dakota and local schools on raising awareness for speed signs and speed sign vandalism. School children created posters reflecting proper behavior and adherence to traffic signals as part of the County's ongoing efforts to reduce crashes through early education and safety messaging.

Because this Project has not yet been fully designed/developed, additional formal Project-specific public engagement has been limited. There is, however, a formal public engagement plan that has been developed and approved which will be implemented at such a time as the County has funding available to move forward with Project design/construction. The full Plan can be found at [www.casscountynd.gov/raisegrant](http://www.casscountynd.gov/raisegrant). The approach aligns with the USDOT's Promising Practices for Meaningful Public Involvement in Transportation Decision-Making Guide and focuses on "going to the people" to ensure the County gets input from disadvantaged and underrepresented populations. It includes the following:



## Door-to-Door Outreach:

For residents who are particularly isolated and outside communities whose only access to those communities is via Highways 4 and 10. A Project contact card with information linking to the County website and with opportunities to register for email or text updates will be provided.



## Outreach to daycares and public schools:

To reach families who might otherwise not be aware of the Project. Again, contact cards will be provided and information for newsletters/other communication will be available.



## Pop-In Public Open Houses:

Which will take place in locations that people already frequent, allowing people to “pop-in” as they please and at times they would already be there. This will include local coffee shops, breweries, and restaurants and will accommodate varying work and activity schedules.



## Virtual Outreach:

All materials and meeting minutes that are provided/produced will also be available online at the County’s website. In addition, a website platform such as Social Pinpoint will be utilized to encourage ongoing public engagement allowing for interactive maps, comment boards, surveys and language translations.



## Stakeholder Listening Sessions:

Highways 4 and 10 are heavily utilized by farmers, haulers, commuters, and a variety of outdoor recreationalists. Several listening sessions will be made available that specifically target these stakeholder groups as well as the general public living within the Project area.

In addition to targeted outreach as outlined, the County will establish a dedicated email address and text message line that will be advertised on the website, on hard-copy contact cards, and on various social media locations that will allow people to subscribe to receive regular Project information and updates as to Project progress and status throughout the lifespan of the Project. To ensure messaging is understood by all ability levels, public-facing messages and materials will be ADA compliant and in “plain” language, at an 8<sup>th</sup> grade reading level. Language translation services will also be offered on materials and supplied as requested.

For additional information related to partnership and collaboration, please see letters of support at [www.casscountynd.gov/raisegrant](http://www.casscountynd.gov/raisegrant).



## Innovation

The Project provides benefits to several communities within the areas surrounding Highways 4 and 10. The Project includes multiple innovative elements and completion will allow additional innovations throughout the project area. Key innovative aspects include:

**Innovative technologies.** The Project will utilize alternative methods of material delivery as well as recycling of used materials for optimal efficiency. Additionally, the county will apply innovative strategies such as perpetual pavement in the construction process to improve maintenance costs and time into the future.

**Innovative project design.** The Project incorporates environmentally friendly design, with sloping based on best land use and nearby material storage to reduce emissions as well as travel and construction time. These practices provide several benefits throughout the design and construction phase.

**Innovative Project Delivery.** Due to the natural geography of Cass County, there are no gravel pits located in the County. This results in significant haul distances from Minnesota or neighboring counties to obtain new gravel for road construction. This requires a 120-mile round trip trucking distance from the nearest gravel pit. The project will establish a nearby recycled aggregate pit to store key material for the project. This added element will result in substantial hours, dollars, and emissions savings through reduced aggregate hauling.

The Project incorporates several innovative technologies throughout the construction phase. The prominent technologies applied here are RAP (Reclaimed Asphalt Pavement) and top layer recycling. FHWA recognizes RAP as one of the most economically and environmentally efficient ways to recycle and construct a new road. Top layer recycling operates in a similar fashion where the top 1 to 2 inches of old asphalt is taken and sent to be used for recycled materials in the asphalt itself. These technologies will significantly reduce the number of new materials required while also cutting waste from the discarded materials.

Another element of the Project is the stabilization of the subgrade utilizing cement for the entire width of the top paved surface. This innovative design reduces the aggregate and asphalt depths needed to carry the projected traffic needs, resulting in less maintenance and down time. Because 12 inches of cement stabilize subgrade is the equivalent of 12–18 inches of aggregate base material, the use of new aggregate significantly increases the environmental impact of truck hauling and use of virgin material due to the lack of aggregate pits within the county. By using the innovative cement treated subgrade it only takes 24 truckloads of cement per mile to strengthen the road, compared to using 510 truckloads of new gravel.

Design also calls for the use of ***Perpetual Pavement***. Perpetual Pavement is a three-layer, flexible pavement design and construction concept. The application of the design concept produces a deep-strength asphalt pavement that can resist structural fatigue distress much longer than average, resulting in longer-lived pavement with low maintenance cost. Utilization of this design technique results in surface replacement in the future but should never require total removal and replacement.



The Project utilizes several innovative features in the design process. Specifically, regarding the sloping, it would be most ideal to go to a 1:5 slope in many of the areas that have significant flooding. However, the natural topography of the land makes that sort of slope much more difficult. To preserve as much of the land as possible the County has instead chosen 1:4 sloping in those areas where land can be preserved with minimal impact on the roadway itself. The Project also calls for a nearby storage area for recycled aggregate that will be used throughout the project. Establishing a nearby storage area prior to construction will provide benefits throughout the construction phase, including reduced travel time, reduced emissions, reduced cost, reduced wait times, and easier access to materials.

The Project also incorporates a new design idea for the County, one in which they would raise the road on Highway 10 near the Maple River. This road raising would create a natural buffer as prevention for washouts, and when accompanied by the ditch sloping, should alleviate flooding altogether. This is a particularly important design aspect as climate change creates potential for worsening flooding seasons in the future.

As mentioned previously, the County will also be utilizing a recycled aggregate pit for the project. Based on median estimates for miles per gallon (MPG) and average tonnage per truck load, accompanied by the assumption that without a gravel pit it would be **120 miles round trip** per load, **FIGURE 6** breaks down the additional burden on each round trip if a recycled aggregate pit is NOT added.

*Figure 6. Round trip without recycled aggregate pit and use of cement treated subgrade, by the numbers*

<b>TOTAL COMBINED ADDITIONAL TONNAGE</b>	<b>127,439</b>
<b>Total loads needed (23 tons/load)</b>	<b>5,541</b>
<b>Total trucking miles (120 miles round trip)</b>	<b>664,899</b>
<b>Total gallons of fuel (5 MPG)</b>	<b>132,980</b>
<b>ESALs (Equivalent Single Axle Load)</b>	<b>1,629,003</b>

“  
**By creating a nearby storage area for project materials, the project will save road time travelled, reduce fuel costs and emissions, and allow for easier, unfettered access to project materials.**”

As can be seen in the table above, the use of a nearby recycled aggregate pit and use of cement treated subgrade will result in enormous savings through reduced emissions, lower road travel time, lower project cost, and less stress on travel routes. This element of the project is vital in making sure the County can execute the Project while having the smallest environmental impact possible.