MINNEHAHA COUNTY HIGHWAY 104 BRIDGE REPLACEMENT PROJECT

Minnehaha County, South Dakota

FY 2023-2024 BRIDGE INVESTMENT PROGRAM (BIP) DISCRETIONARY GRANT

Project Name: Minnehaha County Highway 104 Bridge Replacement Project

Project Type: Bridge Project under $100 million

Future Eligible Project Costs: $3,919,110

2023/2024 BIP Funds Requested $3,141,768

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Supporting Information can be found at:
https://www.srfconsulting.com/minnehahahighway104_bip/

MINNEHAHA COUNTY

Minnehaha County Highway 104 Bridge Replacement

Submitted by Minnehaha County, South Dakota

FY 2023-2024 BRIDGE INVESTMENT PROGRAM (BIP) DISCRETIONARY GRANT

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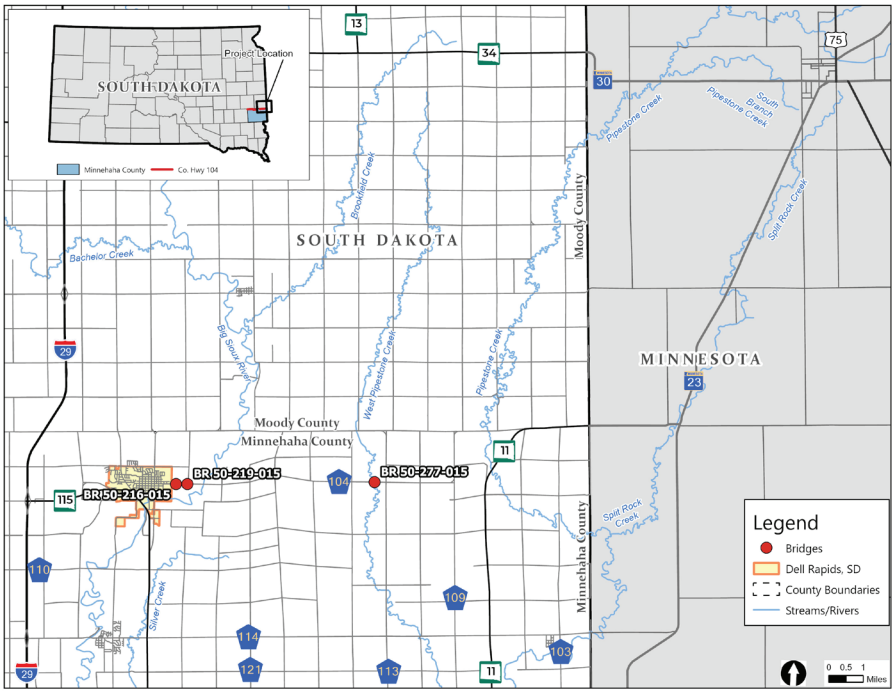
BASIC PROJECT INFORMATION

Project Description

Minnehaha County, South Dakota is submitting this FY 2023-2024 Bridge Investment Program (BIP) grant opportunity request for $3,133,863 in federal funds. The requested funds will be used towards the Minnehaha County Highway 104 Bridge Replacement Project (herein known as the Project) east of the City of Dell Rapids, South Dakota. The Project consists of removing and replacing three bridges (bridge no. 50-216-015, 50-219-015, and 50-277-015) along Minnehaha County Highway 104 (Co. Hwy 104). Located approximately 12 miles north of Sioux Falls, Dell Rapids is a vibrant small town known as "The Little City with Big Attractions" and touted as one of the most distinctive and colorful communities on the Dakota Plains. The Project's total future eligible cost is $3,919,110 and complies with the requirements of the Bridge Project category. The Project is further categorized as a bridge bundling project to optimize cost and schedule efficiencies.

Figure 1 **Project Location in Regional Context**



Co. Hwy 104 is an important east-west Rural Major Collector corridor, part of a broader transportation network that connects vital commodities and small communities in northern Minnehaha County to Interstate 29 (I-29), five-miles to the west of the Project, Minnesota State Highway 23, ten-miles to the east, and U.S. Highway 75 (US 75), 18-miles to the east. Co. Hwy 104 spans 12-miles from Dell Rapids' eastern city boundary to South Dakota State Highway 11 (SD 11) near the South Dakota-Minnesota border on the east. The Project is important regionally because of the essential mobility provided by Co. Hwy 104, connecting residents and critical rural commodities to and from destinations in northern Minnehaha County, southeastern Moody County, and southwestern Pipestone County, Minnesota including residents between Dell Rapids and Minnesota.

The Co. Hwy 104 corridor connects important mining and agricultural commodities between I-29, US 75, Dell Rapids, and Jasper (Minnesota). Dell Rapids is home to two large Sioux Quartzite quarries operated by L.G. Everist, Inc., which provides construction aggregates for concrete, asphalt, chip seal, erosion control, base products, specialty sand, among others. Additionally, Minnehaha County is one of the top agricultural producers in the United States, nationally ranking in the top 85th percentile for market value of agricultural products sold in 2017. Co. Hwy 104 provides a critical link between agricultural producers and the market, connecting agricultural commodities to grain elevators in Dell Rapids (Dell Rapids Co-Op Grain), Jasper (CHS Eastern Farmers), and beyond.

Within the Project area, Co. Hwy 104 is a two-lane rural asphalt highway with one lane in each direction and has a posted speed limit of 55 miles per hour (mph). Current annual average daily traffic (AADT) in the Project area along Co. Hwy 104 is 1,123 vehicles

per day (vpd). Of these, 9.8 percent or approximately 110 vpd are heavy commercial freight vehicles. Co. Hwy 104 along with a network of several minor arterials and major collectors including SD 115, Co. Hwy 121, Co. Hwy 113, and SD 11 provide direct connections between rural residents, commodity producers, small towns, and ultimately enhance mobility to and from northern Minnehaha County, Dell Rapids, Sioux Falls, and beyond.

The bridges (bridge no. 50-216-015, 50-219-015, and 50-277-015) along Co. Hwy 104, east of Dell Rapids, were originally constructed between 1922 and 1940. The bridges have served the transportation network for over 80 years and have operated well past their useful life. In 2023, Minnehaha County conducted a Bridge Type Study, to report existing conditions, perform one-dimensional hydraulic analysis, and present replacement options for the three bridges within a six-mile section of Co. Hwy 104. Several operational and safety concerns were noted for the roadway users, freight haulers, and homes and businesses along the Project corridor. The existing transportation challenges include:

- Poor state of repair of two bridges (bridge no. 50-216-015 and 50-219-015) including structurally deficient and/or functionally obsolete structure, poor deck condition, poor superstructure condition, fair substructure condition, and minimally tolerable structural evaluation appraisal;
- Fair state of repair of bridge 50-277-015 including functionally obsolete structure, fair deck condition, fair superstructure condition, satisfactory substructure condition however, at risk of falling into poor condition within three years;
- Significant mobility and travel time reliability concerns along Co. Hwy 104 due to deteriorated conditions and potential load postings and/or closures of these bridges; and
- Outdated bridge component standards such as bridge railing, transitions, approach guardrails, and guardrail ends increase the safety risk for people traveling over the bridges.

The Project will reconstruct the three bridges as a bundled project. Two of these bridges (bridge no. 50-216-015 and 50-219-015) cross over unnamed tributaries of the Big Sioux River while bridge 50-277-015 crosses over West Pipestone Creek. Additionally, the Project includes roadway improvements associated with the bridges, including roadway reconstruction (approximately 300 linear feet per structure) with two 12-foot travel lanes and up to four-foot paved shoulders on both sides, replacement of roadway pavement markings, and replacement of rumble strips.

Additionally, the Project meets several goals of the BIP including:

1. Improving the safety, efficiency, and reliability of the movement of people and freight over bridges by reconstructing the bridges into a state of good repair;
2. Improving the condition of bridges in the United States by:
    a. Reducing the number of bridges in poor condition or in fair condition and at risk of falling into poor condition within the next three years by reconstructing the bridges into a state of good repair;
    b. Reducing the total person miles traveled over bridges in poor condition, or in fair condition and at risk of falling into poor condition within the next three years by reconstructing the bridges into a state of good repair;
    c. Reducing the number of bridges that do not meet current geometric design standards by reconstructing the bridges to meet current geometric design standards; and
    d. Reducing the total person miles traveled over bridges that do not meet current geometric design standards by reconstructing the bridges to meet current geometric design standards.

Current Transportation Challenges

Co. Hwy 104 is a critical Rural Major Collector, transporting residents and important commercial and agricultural commodities to and from northern Minnehaha County to other regional arterial roadways, essential local destinations, and greater regional destinations. As noted below, the transportation challenges in the Project corridor stem from structural issues and functionality due to old and aging infrastructure, reliability and mobility, and safety concerns.

Table 1 **Bridge Condition Ratings**

Bridge	Location	Deficient Status	NBI Condition Rating[1]					Remarks
			Deck	Super-Structure	Sub-Structure	Channel	Culvert	
50-216-015	Co. Hwy 104 MRM 21.6 Tributary to Big Sioux River	Structurally Deficient & Functionally Obsolete	4	4	5	6	N	Built in 1922, reconstructed in 1966. Does not meet currently acceptable standards for Bridge Railings, Transitions, Guardrail, and Guardrail Ends. Structural evaluation is minimum tolerable.
50-219-015	Co. Hwy 104 MRM 21.9 Tributary to Big Sioux River	Structurally Deficient & Functionally Obsolete	4	4	5	7	N	Built in 1938. Does not meet currently acceptable standards for Bridge Railings, Transitions, Guardrail, and Guardrail Ends. Structural evaluation is minimum tolerable.
50-277-015	Co. Hwy 104 MRM 27.7 West Pipestone Creek	Functionally Obsolete	5	5	6	6	N	Built in 1940. Does not meet currently acceptable standards for Bridge Railings, Transitions, Guardrail, and Guardrail ends. Structural evaluation is better than minimum tolerable.

[1]Bridge condition scores greater than 7 suggest a bridge is new or was repaired to a *good* condition. Scores of less than 5 indicate *poor* condition and repair is required.

According to the Bridge Inspection Reports, the bridges are structurally deficient and/or functionally obsolete, and in need of repair due to other existing moderate to serious issues (Table 1). Bridges 50-216-015 and 50-219-015 are in poor condition and bridge 50-277-015 is in fair condition. According to research performed by FHWA's Long-Term Bridge Performance Program (LTBP), bridge 50-277-015 is at risk of falling into poor condition within two-years, by 2026. In general, the bridges are experiencing significant structural issues as described further below:

Figure 2 **Bridge Sufficiency Rating**

Figure 3 **50-216-015 Column Honeycombing**

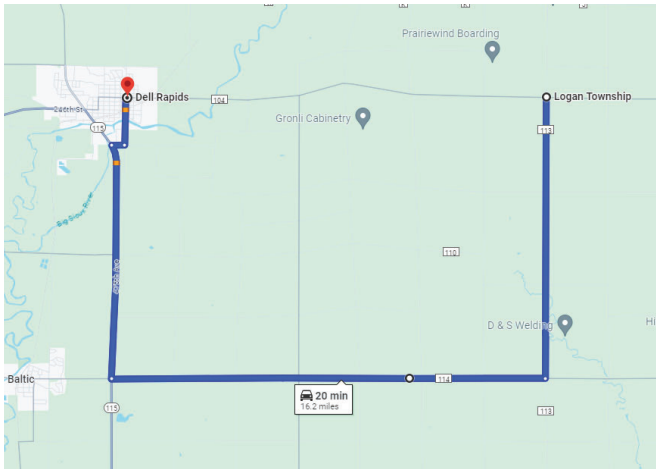
Bridge no. 50-216-015 is a 34-foot, three span continuous concrete bridge with concrete abutments and a 30.2-foot roadway width. It was built in 1966 and has a sufficiency score of 48.5 out of 100 (see Figure 3).

- The bridge is currently experiencing curb cracking and scaling, railing rust, deck spalling, cracking, scaling, efflorescence, and hole through slab, abutment honeycombing and spalling, pier deterioration and lack of consolidation, footing exposure, and channel scour.

Figure 4 **50-219-015 Deck & Curb Deterioration**

Figure 5 **50-277-015 Deck & Curb Vertical Crack over Center Pier**

Figure 6 **Proposed Detour**



Bridge no. 50-219-015 is a 36.3-foot, two span continuous concrete bridge with concrete abutments and a 24.3-foot roadway width. It was built in 1938 and has a sufficiency score of 35.3 out of 100 (see Figure 4).

- The bridge is currently experiencing curb scaling with exposed rebar, railing scaling with exposed rebar, significant damage indicating severe vehicle impact, deck transverse cracking, longitudinal cracking, and map cracking, efflorescence, scaling, and spalling, abutment scaling, horizontal cracking, vertical cracking, and efflorescence, pier vertical cracking, scaling, and efflorescence, channel scour and undermining.

Bridge no. 50-277-015 is a 70.8-foot, four span continuous concrete bridge with concrete abutments and a 24.3-foot roadway width. It was built in 1940 and has a sufficiency score of 58.5 out of 100 (see Figure 5).

- The bridge is currently experiencing curb spalling and scaling with exposed rebar, railing spalling with exposed rebar, cracking, heavily weathered, damage indicating minor vehicle impact; deck longitudinal cracks, honeycombing, map cracking, efflorescence, spalling with exposed rebar, abutment scaling, vertical cracking, and scaling, pier vertical cracking, scaling, and exposed footings, and channel scour.

Reliability & Mobility

As shown in Table 1, the bridges associated with the Project are rated in either poor condition, or fair condition and at risk of falling into poor condition within the next three years. The reliability and mobility provided by Co. Hwy 104 is at risk as bridge conditions continue to deteriorate. With the age and current conditions of the structures, rural residents, freight haulers, and commodity producers of northern Minnehaha County are at greater risk of one or more of the bridges being load posted or closed completely due to structural deficiencies, negatively impacting how people go about their daily lives and how important regional commodities reach the market. If the bridges were to be load posted or closed, it would add 16.2-miles and approximately 20-minutes of travel time to get around.

Freight

Routine maintenance and rehabilitation activities have extended the useful life of the bridges as far as they can go. However, the risk of bridge load posting, and closure is growing. As the aging infrastructure continues to deteriorate,

maintenance and rehabilitation activities become less effective and less efficient. This challenges the multimodal transportation system and puts a critical route along Co. Hwy 104 at increased risk, jeopardizing mobility of rural residents and essential commodity movement to and from northern Minnehaha County. Co. Hwy 104 is part of the National Truck Network, defined as part of the National Network Not on National Highway System. The National Truck Network identifies combinations of the Interstate System and portions of the Federal-aid Primary System serving to link cities and densely developed portions of States on routes which are extensively used by large vehicles for interstate commerce, and which do not have any unusual characteristics causing current or anticipated safety problems.

Currently, 9.8 percent of traffic along Co. Hwy 104 is heavy vehicles and freight traffic. With continued growth and expansion of operations at L.G. Everist Inc.'s Dell Rapids East Quarry just south of bridge no. 50-216-015, freight and heavy vehicle traffic is expected to increase across all three bridges along Co. Hwy 104. Expanded operations east of the quarry will include a new entrance onto Co. Hwy 104 east of bridge no. 50-219-015. The Dell Rapids East Quarry currently moves approximately 500,000 tons of material annually by truck, which travels east and west onto Co. Hwy 104 to connect to the broader regional market in Sioux Falls (SD), Fargo (ND), and Minnesota. The safety risk associated with all three structurally deficient and/or functionally obsolete bridges is anticipated to grow, as narrow widths of the existing structures create unsafe conditions compounded by the presence and expected growth of heavy commercial and agricultural vehicles that travel along Co. Hwy 104.

Safety

Given the advanced age of the structures, the bridge railings, transitions, approach guardrails, and bridge guardrail ends do not meet acceptable current standards. These outdated standards increase the sightline deficiencies and safety risk of people traveling over the bridges in the Project area, putting people at unnecessary risk to go about their daily lives. The guardrails and railings of two of the bridges (bridge no. 50-219-015 and 50-277-015) show damage from previous vehicular impacts. Outdated standards of guardrail and railing components associated with all the three bridges put people at greater risk. For example, modern bridge guardrail standards help keep vehicles on the road, provide safe recovery, and reduce crash severity. Current guardrail standards associated with the bridges do not prevent vehicle impacts. Furthermore, the obsolete bridge railings may not prevent vehicles from crashing through or over the bridges into the waterbody below. There is evidence of vehicular impacts at bridge no. 50-219-015 and 50-277-015, with the latest inspection report finding the structural integrity of the railing at bridge no. 50-219-015 is compromised.

Furthermore, with two bridges considered structurally deficient, and one at risk of falling into structural deficiency within three years, there is greater risk of system failure. Failure of any of the three bridges will shut down the entire Co. Hwy 104 system through the Project area. The people traveling over the Co. Hwy 104 bridges may be at greater safety risk as the structures continue to age, experience more freight traffic, and grow vulnerable to failure. Growing vulnerability comes from weather events, which are becoming more intense in the region. All three bridges have some degree of scouring, which is exacerbated by storm and flood events which can lead to footing undermining and bridge failure.

Proposed Improvements

Minnehaha is requesting phased FY 2023-2024 BIP Grant funds for the following activities including appropriate contingencies and inflation:

Preconstruction Phase

- Preliminary Engineering
- Environmental Documentation/National Environmental Policy Act (NEPA)
- Right-of-Way (ROW) Acquisition
- Final Design

Construction Phase

- Removing existing bridges 50-216-015, 50-219-015, and 50-277-015,
- Reconstructing all three bridges to current modern standards including bridge railings, transitions, approach guardrail, and bridge guardrail ends,
- Extending the width of all three bridges to accommodate the South Dakota Department of Transportation's (SDDOT) 15-foot clear zone requirements,
- Four to one (4H:1V) fill slopes or less through clear zone,
- Reconstructing approximately 250 to 300 feet of roadway associated with each bridge location to match revised bridge profile,
- Widening of all the reconstructed bridges to 28-foot total pavement width including up to four-foot paved shoulders along both traffic directions to allow for improved sight distances, and
- Installing pavement markings and rumble strips along each new bridge.

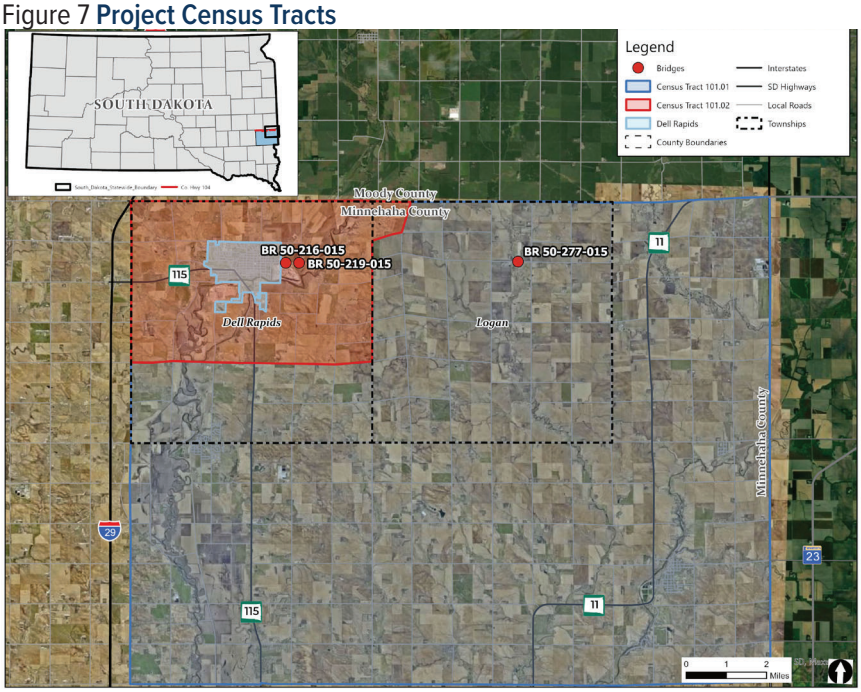
Project History

The Project started in 2023, when Minnehaha County conducted a study of bridges along two county roads, including three bridges on Co. Hwy 104 and one bridge on Co. Hwy 103, entitled Bridge Type Study. The County incurred a cost of $41,280 to hire a consultant and perform the study. The intent of the study was to provide a summary of the existing conditions and present a replacement option of three bridges along Co. Hwy 104 and one bridge along Co. Hwy 103. The study recommendations are based on hydraulic, environmental, transportation, and geotechnical analysis. The study also provided planning level cost estimates for cost associated with preliminary engineering, environmental documentation, right-of-way acquisition, final design, and replacement of all bridges. The Project and BIP request does not include the bridge along Co. Hwy 103, as those improvements do not directly benefit the transportation network along Co. Hwy 104.

Project Location

The Project will reconstruct bridges 50-216-015, 50-219-015, and 50-277-015 along approximately six miles of Co. Hwy 104, east of the city boundaries of Dell Rapids in Minnehaha County, SD as shown in Figure 7. The Project limits are between mile route marker (MRM) 21.5 and 27.7 along Co. Hwy 104. The geospatial location of the Project is approximately 43.826008°N, -96.694347°W on the west, and approximately 43.826344°N, -96.578158°W on the east.

Figure 7 **Project Census Tracts**



Minnehaha County, created in 1862, is a political subdivision of the State of South Dakota encompassing 810 square miles. Minnehaha County is the largest county in the state in terms of population. The 2020 Decennial Census recorded a population of 197,214 while the 2023 estimated population is 209,414. Sioux Falls is the county seat and the most populous city in South Dakota. The Project is in proximity to Dell Rapids, located about 12 miles directly north of Sioux Falls.

Bridges 50-216-015 and 50-219-015 are in Dell Rapids Township at a distance of 0.10 and 0.46 miles respectively, east of city boundaries of Dell Rapids along Co. Hwy 104 while bridge 50-277-015 is in Logan Township

located 5.9 miles east of the city boundaries. The city of Dell Rapids, Dell Rapids Township, and Logan Township have a total population of 3,996, 567, and 281 persons respectively, according to the 2020 census.

The Project is located within a rural area, and therefore, is designated as a rural project. The Project sits across two Minnehaha County census tracts, Census Tract 101.01 (46099010101) and Census Tract 101.02 (46099010102), neither of which are designated as Areas of Persistent Poverty (APP) or Historically Disadvantaged Communities (HDC). The Project is not located in 2020 Census-designated Urbanized Area, Qualified Opportunity Zone, Empowerment Zones, Promise Zones, or Choice Neighborhoods.

Lead Applicant

Minnehaha County is the applicant and primary point of contact of this BIP application. The County has extensive experience procuring and developing transportation and bridge improvement projects. With 347 center-line miles of two-lane rural highways and 195 bridges under county ownership, Minnehaha County is experienced and committed to the operations and maintenance of the multimodal transportation system. Minnehaha County owns the most structures of any county in South Dakota. Among various other Federal and State department funding programs, Minnehaha County commonly works with Federal-aid and State-aid formula funds administered by the SDDOT and/or Sioux Falls Metropolitan Planning Organization (MPO) to increase safety and reliability of the County's multimodal transportation system. Most recently, the County received and entered an agreement for Local Bridge Replacement Program funds administered by the South Dakota Department of Transportation (SDDOT) for bridge replacements, including engineering and construction. The approximately one-million-dollar ($1 million) project is on schedule and within budget.

Primary Contact

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Other Public and Private Parties

The Project is supported by various public and private organizations including City of Dell Rapids, Congressional Delegation, South Dakota Legislative Body, SDDOT, and L.G. Everist, Inc. However, no public or private parties, other than Minnehaha County, are involved in the delivery of the Project nor will receive a direct and predictable financial benefit if the project is selected for an award. The Project will benefit residents, visitors, and the business community of Minnehaha County due to reliability improvements in the transportation infrastructure and reduction in construction timeline with project bundling.

Additional Eligibility Requirements

Maintenance Commitment

The Project will be operated and maintained by Minnehaha County. The agency will perform routine inspection and maintenance of all the structures. Maintenance will be provided through the County's Highway Fund. Operations, maintenance, and major rehabilitation activities are anticipated throughout the life cycle of the new bridge. The County's Project Development and Operations Manual guides specific activities for bridge preservation. The Project will undergo cyclical and condition-based maintenance activities through the life cycle of the structure (anticipated to be 75-100 years). Minnehaha County is committed to funding bridge preservation activities for the Project.

Bicycle & Pedestrian Accommodation

Bicycle and pedestrian accommodation will be built into the Project by widening the current shoulder, providing separation and increased safety for bicyclists and pedestrians. As the first link in a rural, regional multimodal system, the Project will lead to construction of new bike and pedestrian infrastructure to accommodate vulnerable roadway users safely and at a reasonable cost to the Project. This will further both the USDOT's, SDDOT's, and the County's goals towards improving the safety, efficiency, and reliability of the movement of people over bridges.

NATIONAL BRIDGE INVENTORY DATA

Detailed information from the National Bridge Inventory database is provided for each bridge here.

PROJECT BUDGET

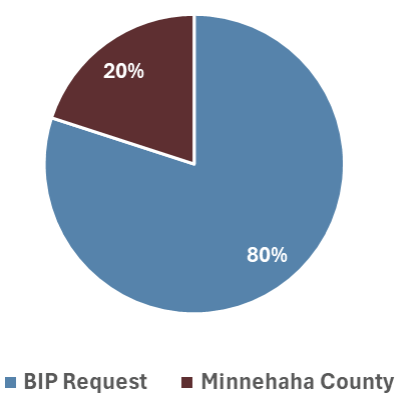
Grant Funds

Total Future Eligible Project Cost: $3,919,110

BIP Request Amount: $3,133,863 (80 percent of total future eligible project cost)

Availability and commitment of funding sources:

Figure 8 **Project Funding Breakdown**



The total future eligible Project cost is $3,919,110 which includes environmental documentation, preliminary design engineering, final design, right-of-way acquisition, construction including construction administration, and contingencies. The construction is scheduled to start in 2028. The detailed construction cost estimate for the Project has been prepared and can be found here. The cost estimate was created based on bid pricing for the year 2023 and accounts for three percent annual inflation until the year-of-expenditure (2028). The Project budget also accounts for sufficient contingency amounts to cover unanticipated cost increases.

Minnehaha County has spent $41,280 to date in previously incurred costs on Bridge Type Study to advance project delivery.

Sources

Minnehaha County

Minnehaha County is committed to providing $785,247 (20 percent of total future eligible costs) in funds through the County Highway Fund to be invested for infrastructural improvements of bridges along Co. Hwy 104. The County has programmed $501,213 of local funds in the County's approved 2024-2028 Transportation Improvement Plan in years 2027 (design) and 2028 (construction), as of Fall 2023. Minnehaha County will update the Transportation Improvement Plan to reflect updated cost estimates as the Project progresses. The County will update the 2025-2029 Transportation Improvement Plan in Fall 2024 to reflect the cost estimates and cost share as detailed in Table 2.

Table 2 presents the detailed project budget, including bundled cost and source of funding for each major project activity, both in dollars and percentages

Table 2 Bundled Project Funding Breakdown

Project Components	Federal Funding		Non-Federal		Total Cost Estimate
	Bridge Investment Program (BIP)		Minnehaha County		
	Dollars	Percent Total	Dollars	Percent Total	
Environmental Documentation	$0	0%	$200,450	5%	$200,450
Preliminary Design	$0	0%	$151,500	4%	$151,500
Final Design & Construction Engineering	$0	0%	$377,600	10%	$377,600
Right-of-Way Acquisition	$0	0%	$25,697	1%	$25,697
Construction Costs, incl. Inflation	$2,871,385	73%	$0	0%	$2,871,385
Contingency	$262,478	7%	$30,000	1%	$292,478
Total Future Eligible Costs	**$3,133,863**	**80%**	**$785,247**	**20%**	**$3,919,110**
BIP Request	$3,133,863	80%	**Total Project Cost**		**$3,919,110**
Other Federal	$0	0%			
Non-Federal	$785,247	20%			

Table 3 presents the unbundled project cost per bridge broken down by major activities.

Table 3 Unbundled Cost by Major Project Activities

Major Project Activity	Bridge No.			Total
	50-216-015	50-219-015	50-277-015	
Environmental Documentation	$22,000	$122,000	$67,000	$211,000
Preliminary Design	$73,000	$38,500	$42,500	$154,000
Final Design & Construction Engineering	$125,000	$125,000	$136,000	$386,000
Right-of-Way Acquisition	$12,095	$2,382	$11,220	$25,697
Construction Costs, incl. Inflation	$809,492	$984,421	$1,130,872	$2,924,785
Contingency	$80,949	$98,442	$113,087	$292,478
Total Cost	**$1,122,537**	**$1,370,745**	**$1,500,679**	**$3,993,960**

Uses of all Project Funding

The requested BIP funds will be used towards funding the future eligible costs of the Project. The Project has not received any other federal funds so far. Minnehaha County may pursue funding under other federal programs as they become available, if this BIP funding request is not awarded. The bundling of the three bridges together leads to a total saving of $74,850 compared to constructing them under separate bid projects. As mentioned previously, the Project budget accounts for sufficient contingency amounts to cover unanticipated cost increases.

BIP Funding Needs

If the BIP funding is not awarded, the Project could be significantly delayed from its existing schedule or may have significant scope reduction. All bridges in the Project corridor are reported to be either structurally deficient, functionally obsolete, or both. As a result, immediate reconstruction/rehabilitation is recommended to maintain safe levels of service and operations along Co. Hwy 104. Additionally, the impacts of inflation have required Minnehaha County to reassess its upcoming capital program.

This Project is a priority project for the County. Securing the BIP funds for this Project will allow Minnehaha County to reconstruct the bridges along Co. Hwy 104 in the most timely and efficient manner possible. In absence of the BIP award, the schedule and the scope of the Project will be negatively impacted.

MERIT CRITERIA

1. State of Good Repair

The Project meets the goal of USDOT and Minnehaha County to improve the condition and safety of existing County-owned transportation infrastructure within the right-of-way, before proposing projects that add new general purpose travel lanes serving single occupancy vehicles.

There are 195 bridges operated and maintained by Minnehaha County. It is critical to maintain the performance and value of the County's multimodal transportation assets to continue to provide safe and high-level of service to County residents, visitors, and businesses while minimizing lifecycle costs. The investment made by the USDOT and Minnehaha County will ensure that the current state of failing infrastructure is restored, upgraded, and maintained to build a safe transportation network that reduces future maintenance needs and lowers lifecycle costs

Addressing Current and Projected Vulnerabilities

Figure 9 **50-216-015 Backwall Spall**

Figure 10 **50-219-015 Slab with Stalactites**

Figure 11 **50-277-015 Concrete Railing Spall and Exposed rebar**

Co. Hwy 104 provides critical rural mobility between I-29 on the west and US 75 on the east, and it is part of the nation's critical freight network. The bridges along Co. Hwy 104 in the Project area show major warning signs of physical deterioration and are designated as structurally deficient and/or functionally obsolete with other structural issues needing immediate remediation. As noted under the Current Transportation Challenges, the bridges are currently experiencing:

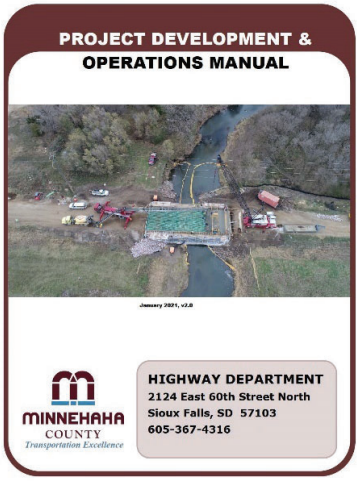
- Curb cracking, scaling, and spalling with exposed rebar
- Deck cracking, scaling, spalling with exposed rebar
- Abutment honeycombing, spalling, cracking, scaling,
- Pier deterioration, cracking, scaling
- Footing exposure and undermining,
- Channel scour.

Under a No-Build scenario, Minnehaha County expects the bridges to no longer be serviceable and Co. Hwy 104 would be closed to traffic through the Project area. Given the roadway's strategic importance for multimodal mobility, future closure will cause a huge impact to the residents of northern Minnehaha County, Dell Rapids, and put a major strain on the transportation network and economy of the region.

The Project improvements address current and projected vulnerabilities, through full reconstruction of the bridges, associated approaches and roadway reconstruction, and modernization of key bridge components to a current safer standard. Not only does the Project provide much needed safety enhancements but ensures efficiency of the multimodal transportation network into the future, mobility of goods and services, improved accessibility and mobility of people, and sustained rural economic growth. Timely reconstruction of bridges 50-216-015 and 50-219-015 (currently in poor condition) and bridge 50-277-015 (currently in fair condition and at risk of falling into poor within next three years) will lead to a resilient infrastructure network along Co. Hwy 104 that is able to withstand current and projected vulnerabilities. Therefore, the Project is a sound investment to maximize and preserve the long-term value of Co. Hwy 104 and the surrounding transportation network, and to sustain the long-term performance of Co. Hwy 104 as a Rural Major Collector.

Minnehaha County Project Development & Operations Manual

Minnehaha County has a demonstrated history of fully funding maintenance improvements and takes a proactive approach to operations and maintenance of assets. The County's Project Development & Operations Manual was originally developed in 2019 and recently updated in 2021. The manual provides guidance through policies and procedures surrounding general Highway Department maintenance and operations, project development, and the administration of design and construction projects. Furthermore, the manual provides minimum levels of expectation and establishes standards for the County to achieve consistency, and to operate and maintain the multimodal transportation system in a state of good repair. The development and operations manual will serve as a critical guide to ensure all necessary operations and maintenance is implemented over the Project's lifecycle.



Operations and Maintenance Funding

Minnehaha County is committed to implementing timely investments in capital and preventative maintenance treatments to extend the service life of assets while reducing lifecycle costs. Ongoing operations and maintenance (O&M) costs on the County highway system are funded by taxes and fees including:

- Motor Vehicle Fees
- State Pooled Motor Vehicle Fee
- Wheel Tax
- Federal highway funds (Surface Transportation Block Grant administered by the State)
- Port of Entry Fees
- Sale of County Property
- Weed and Pest Grants
- Invested Interest
- Metro Transportation
- Permit Fees
- Mobile Home Tax
- Motor Fuel Tax

Minnehaha County is unique in that is the only county in South Dakota that is 100 percent funded by the Highway Fund (comprised of revenue sources listed above). The Minnehaha County Highway Fund receives no subsidy from other County revenue sources such as property tax (General Fund).

Operations and Maintenance Cost

Minnehaha County estimates lifecycle costs (75 years) of the Project to be $220,350. Table 4 presents key operations and maintenance activities that would be performed on the bridges and associated roadways consistent with the County's Project Development and Operations Manual. Detailed analysis of the operation and maintenance activity cost estimates is available in Section V: Benefit-Cost Analysis. The BCA estimates $63,900 in operations and maintenance costs for the Project through year 2059.

Table 4 **Lifecycle Maintenance Items and Associated Costs Per Structure**

Activity	Frequency	Lifecycle Quantity	Unit Cost	Total
Sign Repair/Replacement	Every 5-10 years	15	$140.00	$2,100.00
Concrete Patching/Crack Sealing	Every 20-25 years	4	$4,000.00	$16,000.00
Small Tree/Brush Growth Removal	Every 4-6 years	19	$250.00	$4,750.00
Debris Removal	Every 10-15 years	8	$1,500.00	$12,000.00
Channel Cleanout	Every 20-25 years	4	$3,000.00	$12,000.00
Bridge Inspection	Every 2 years	38	$700.00	$26,600.00
			Structure Total	$73,450.00
			Project Total	**$220,350.00**

**Assumes Replacement Cast-in-Place Reinforced Concrete Box Culvert Structure Type and 75-year Service Life.*

Based on lifecycle costs shown in Table 4 and historic operations and maintenance costs of the existing bridges, the operations and maintenance costs of the Project are more efficient than operations and maintenance costs of the current bridges. Minnehaha County will spend approximately 78 percent less on operations and maintenance of the new bridges.

2. Safety and Mobility

One of the primary needs of the Project is to improve safety of all users travelling through northern Minnehaha County, Dell Rapids, and beyond. The latest Bridge Inspection Reports identify growing structural degradation and safety issues along the corridor. On Co. Hwy 104 in the Project area between mile route marker (MRM) 21.5 and MRM 27.7, twenty-two crashes occurred from 2018 to 2023. Of the 22 crashes, five (22.7 percent) occurred within 500-feet of the three bridges. Two of the five crashes (40 percent) in proximity to the bridges were bridge railing strikes, with one eastbound vehicle crashing into bridge no. 50-219-015 in 2018, and one eastbound vehicle crashing into bridge no. 50-277-015 in 2021. No injuries were reported as part of the two bridge-related crashes however, risk for injurious crashes is high, as all three of the bridges do not meet current guardrail and railing standards. Bridge guardrails built to current standard are known to make roads safer and lessen the severity of crashes. Co. Hwy 104's historic precedent of bridge-related crashes in the Project area, and projected future traffic, increases the safety risk of bridge-related crashes with potentially severe outcomes. Studies show that guardrails and bridge rails, including other immoveable components of the existing structures, increase the probability of fatal injury crashes. As shown in Table 5, crashes within proximity of the bridges are expected to increase from 0.83 crashes in 2021 (annual average based on historical data) to 1.24 crashes in 2045.

Table 5 **Existing and Forecast Traffic and Safety**

Year	AADT (includes heavy commercial)	HCAADT (heavy commercial only)	Annual Person-Miles-Traveled (PMT)[2]	Annual crashes within 500-feet of bridges[3]
2021	1,120	110	111,783	0.83
2045 Forecast[1]	1,667	163	166,408	1.24

[1]Calculated from NBI Data's Annual Growth Percentage of 1.67%

[2]PMT is calculated using AADT, HCAADT, passenger vehicle occupancy of 1.67, heavy commercial vehicle occupancy of 1.00[link BCA], and length of bridges in miles including bridge approaches (approximately 900 feet or 0.17 miles).

[3]Annual crashes within 500-feet of bridges for year 2045 is calculated by proportional increase of AADT/PMT.

Figure 12 **50-216-015 Bridge Railing**

Exacerbated by substandard bridge components and railings, all three bridges of the Project are within the clear zone of Co. Hwy 104. Clear zones are important on rural high-speed highways like Co. Hwy 104, because they increase the likelihood that a roadway departure results in a safe recovery, rather than a crash. With antiquated bridge guardrail and railing designs in the Project area, for vehicles that depart the roadway or are involved in a roadway departure crash, the bridges pose a significant safety hazard. Compounding the problem near the bridges, ditch slopes steepen, making recovery after a road departure more challenging, while further increasing the chance of severe crash.

Figure 13 **50-219-015 Bridge Railing**

Figure 14 **50-277-015 Bridge Railing**

AADT counts indicate 2021 volumes along Co. Hwy 104 carry 1,120 vpd through the Project corridor. Future volumes along Co. Hwy 104 through the Project area are expected to be 1,667 vpd by year 2045. Based on Table 5 calculations, between 2030 and 2045, the Project will eliminate approximately 2.4-million person-miles traveled over:

- Bridges in poor condition, or in fair condition at risk of failing into poor condition within the next three years
- Bridges that do not meet current geometric design standards, or cannot meet the load and traffic requirements typical of the regional transportation network

Without the Project, this growth in traffic volume will create greater unnecessary safety risk for vehicle drivers and occupants travelling along Co. Hwy 104.

Project Elements to Improve Safety

The proposed Project improvements support the goals of the County's Comprehensive Plan which emphasizes maximizing roadway system safety and efficiency for travel throughout Minnehaha County. The Project elements to improve safety include:

- Removing functionally obsolete bridges and outdated bridge guardrail and railing components associated with each,
- Extending the length of all three bridges to accommodate the SDDOT's 15-foot clear zone requirements,
- Grading four to one (4H:1V) fill slopes or less through clear zone,
- Replacing roadway striping and rumble strips,
- Four-foot paved shoulder for safer bicycle and pedestrian accommodation.

The safety improvements due to this Project reduce existing safety issues along the corridor today by removing structurally deficient bridges and obsolete structural components such as guardrails and railings out of the clear zone, greatly reducing the chance of bridge-related crashes. The Project also flattens ditch slopes in proximity to the new bridges to further reduce crashes involving roadway departure by allowing vehicles to recover or safely come to a stop.

3. Economic Competitiveness and Opportunity

Economic Impacts & Freight Movement

The Project replaces the three bridges, eliminating impending load posting and/or possible closure of the bridges caused by structural deficiency and degradation. The Project sustains the mobility and reliability of Co. Hwy 104 as a vital truck route and freight corridor for the local and regional economy.

Minnehaha County is one of the top agricultural product producers in the United States, nationally ranking in the top 85th percentile for market value of agricultural products sold in 2017. According to the 2021 Economic Contribution Study of South Dakota Agriculture, Ethanol and Forestry, Minnehaha County provides the largest value added contributions from agriculture, forestry, and related industries in South Dakota, with over $2.3 billion value added in 2019. The County also has the most jobs created by agriculture and forestry, estimated to be 25,211 or just over 19 percent of agriculture and forestry jobs in the state. The SDDOT's Freight Plan identifies agricultural commodities as the majority of the top 12 shipped commodities ranked by value, making up 74 percent of the total shipped by value in 2017, and projected to comprise 76 percent of total shipment value in 2050. Most freight movement in South Dakota is by truck, accounting for 63 percent by tonnage in 2017, and projected to comprise 63 percent by tonnage in 2050.

Figure 15 **South Dakota Top Ten Counties, Value Added from Agriculture and Forestry Industries (SD DANR)**

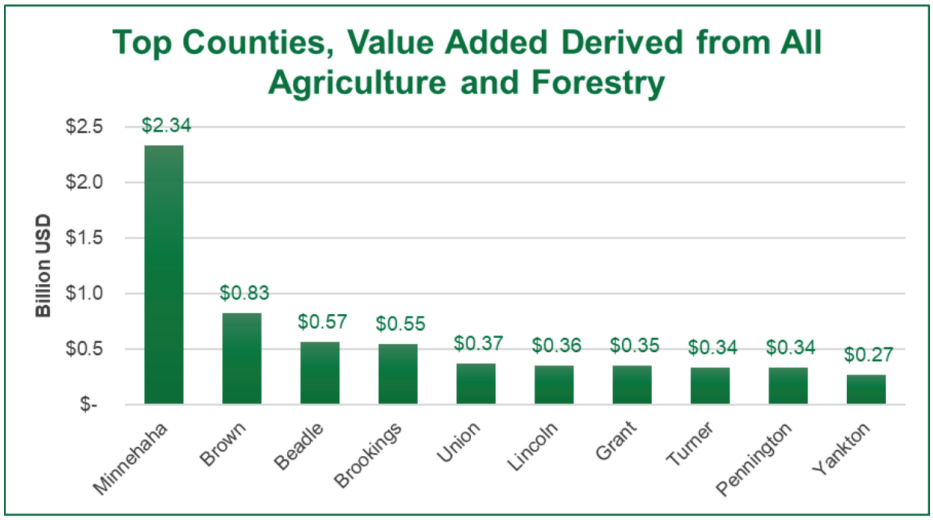


Table 6 shows an annual growth rate of 1.67 percent, with total heavy commercial traffic increases from year 2021 of approximately 22 percent increase by year 2033, and over 48 percent increase by year 2045. As noted above, Co. Hwy 104 is an important regional freight corridor and is part of the National Truck Network. Dell Rapids is a critical hub for Minnehaha County's economy given its unique proximity to major economic hubs such as Sioux Falls Metropolitan

Area. Co. Hwy 104 provides a direct link between major freight corridors such as I-29, five-miles to the west, MN 23, ten-miles to the east, and U.S. Highway 75 (US 75), 18-miles to the east. Co. Hwy 104 in the Project area provides vital connection for the regional agricultural economy, as people and commodities travel to agricultural, mining, industrial, commercial, and manufacturing hubs across South Dakota, Minnesota, and North Dakota.

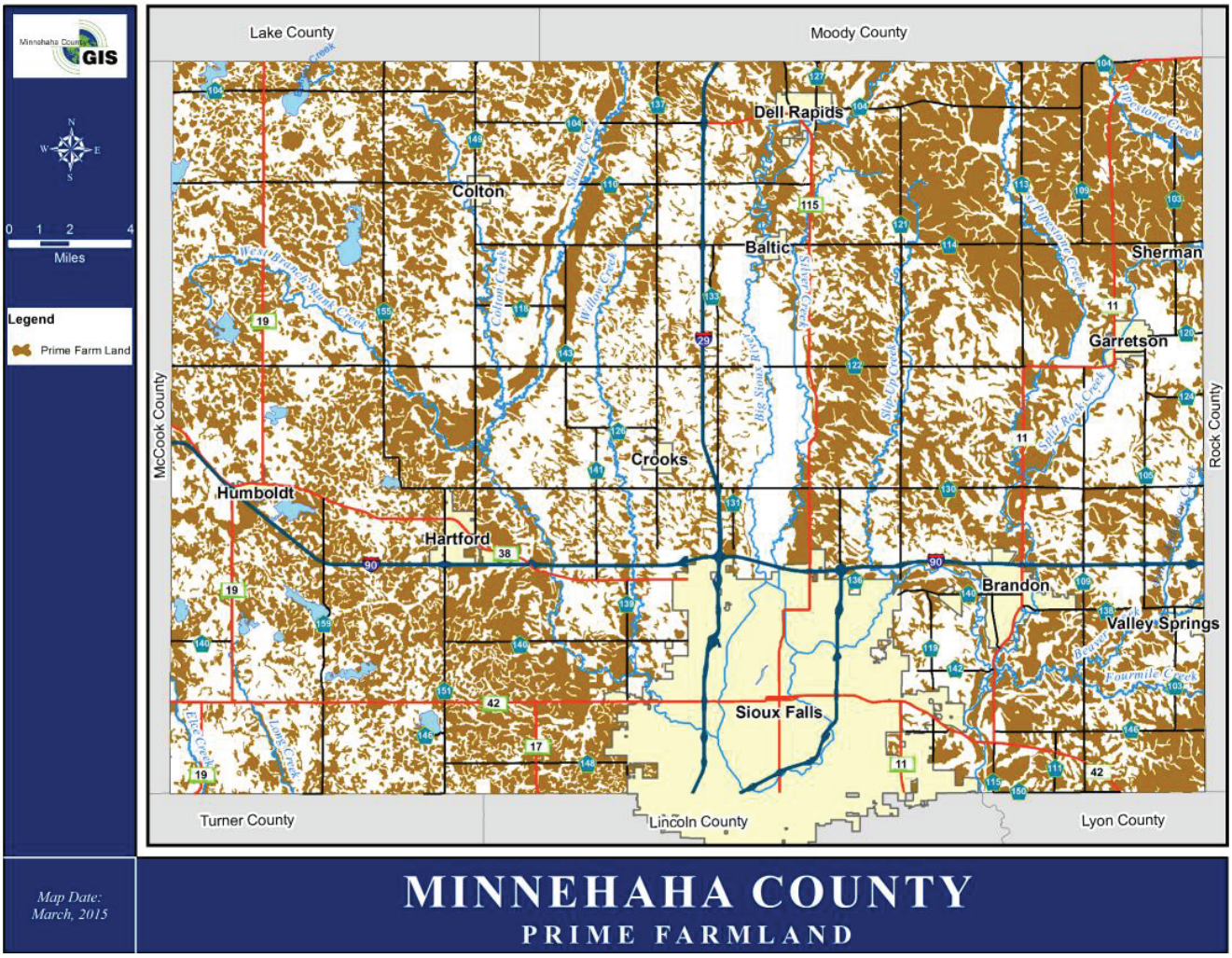
Table 6 **HCAADT Forecast**

Year	AADT (total)	HCAADT	% Change from 2021
2021	1,120	110	0%
2033	1,366	134	21.99%
2045	1,667	163	48.81%

In addition to regional significance, Co. Hwy 104 provides direct access to some of the richest and highest yielding farmland in Minnehaha County, Prime Farmland. Co. Hwy 104 is an essential link between agricultural operations and the market, connecting Prime Farmland, agricultural jobs, and yielded commodities to important local destinations in Dell Rapids (Dell Rapids Co-Op Grain, Dell Rapids Co-Op Grain Fertilizer Plant), Jasper (CHS Eastern Farmers), and beyond. Dell Rapids is also home to major mining operations and commodities, with two large Sioux Quartzite quarries operated by L.G. Everist, Inc., which produce construction aggregates for concrete, asphalt, chip seal, erosion control, base products, specialty sand, among others.

The Project will improve supply chains by improving travel time reliability of freight vehicles throughout the Project area and beyond. The Project will also support current and estimated future traffic demands of this regional network by addressing current structural and functional conditions of the bridges.

Figure 16 **Distribution of Prime Farmland**



4. Climate Change, Sustainability, Resiliency, and the Environment

Greenhouse Gas Emissions

Under a No-Build condition, the County will be forced to load-post and/or close the bridges to traffic. This scenario will cause the traffic to detour or divert around the Project area, adding 16.2-miles and approximately 20-minutes to trips through the Project area. The detour would increase vehicle miles traveled (VMT) and vehicle hours traveled (VHT) resulting in greater greenhouse gas emissions.

Table 7 **Greenhouse Gas Reduction**

Greenhouse Gas	Reduction (with Project)
Carbon Dioxide (CO2)	28,437.000 metric tons
Nitrogen Oxides (NOx)	28.702 metric tons
Sulfur Dioxide (SO2)	0.163 metric tons
Particulate Matter (PM)	0.588 metric tons

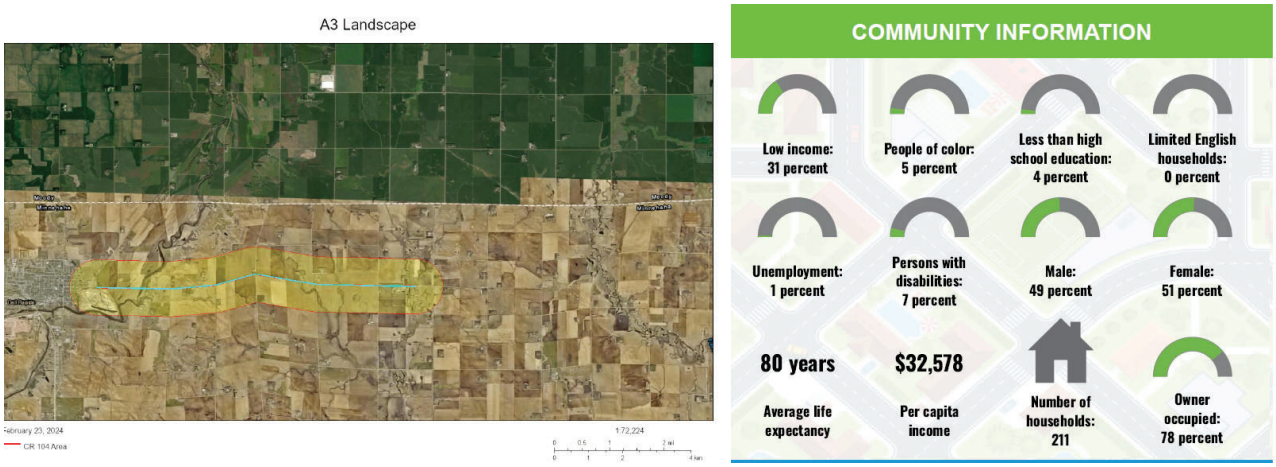
Construction of the Project and lifecycle operations and maintenance efficiencies will reduce transportation-related air pollution and greenhouse gas emissions by an estimated 28,467 metric tons.

Project Delivery Components

Environmental Justice Analysis

As part of the Documented Categorical Exclusion (DCE) process and in compliance with Executive Order (E.O.) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, the Project will undergo an Environmental Justice (EJ) Analysis pursuant to the SDDOT's Environmental Procedures Manual. The manual recommends using U.S. EPA's EJSCREEN tool for the analysis to identify low-income and/or minority populations in proximity to the Project. If concentrations of minority and/or low-income populations are identified in the study area, a determination of adverse impact will be made. Depending upon the determination of adverse impact under the SDDOT's National Environmental Polic Act (NEPA) process, and whether the adverse impact is disproportionate to minority and/or low-income populations, avoidance, minimization, or mitigation measures will be taken in compliance with SDDOT's Public Involvement Plan, which provides guidelines to involve all impacted populations in the decision-making process.

Figure 17 **Community Report, Project Area Half-Mile Buffer (EJSCREEN)**



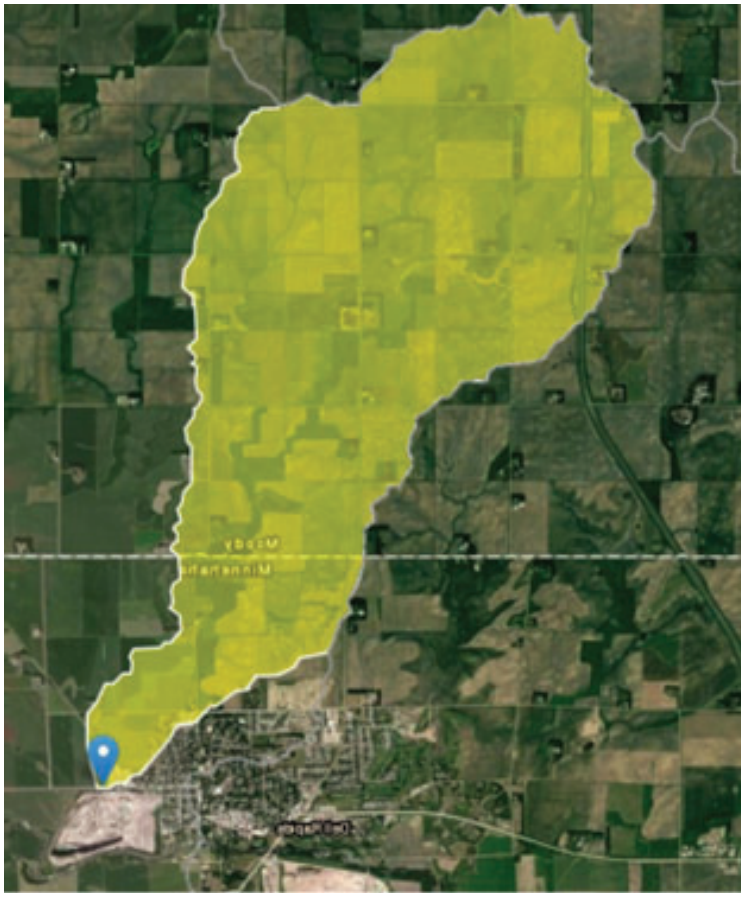
According to the EJSCREEN Community Report, 611 people live within a half-mile the Project. The minority population makes up five percent and low-income population makes up 31 percent of the total population living within a half-mile of the Project. In proximity to the Project, neither concentration of minority and low-income population is higher than that of the state or nation.

Given the scope of the Project and minimal right-of-way acquisition required, the proposed improvements are not anticipated to have a disproportionately adverse impact on minority and/or low-income populations.

Avoiding Floodplain and Wetland Impacts

Bridges 50-216-015 and 50-219-015 carry Co. Hwy 104 over Unnamed Tributaries of the Big Sioux River and are located approximately a half-mile north of the Big Sioux River. Both bridges are in a FEMA Zone A Floodplain or the 100-year floodplain. Bridge 50-277-015 carries Co. Hwy 104 over West Pipestone Creek which is also in a FEMA Zone A Floodplain or the 100-year flood plain. Minnehaha County adheres to a No-Rise Certification that all proposed replacement structures shall not raise the flood elevation from the 100-year storm event in accordance with the Minnehaha County Highway Department Project Development and Operations Manual. To achieve this goal, the design of the new bridges require a delicate balance of hydraulic modeling and design, permit coordination, informed structural design, cost evaluation, and constructability consideration. The new bridges are designed to accommodate calculated hydraulic flows and meet the requirements for scour countermeasures. A wetland delineation will be completed with preliminary engineering to identify wetland impacts and necessary restoration associated with the Project.

Figure 18 **Drainage Basin at 50-216-015 (USGS StreamStats)**



Avoiding Adverse Environmental Impacts

The Project will be implemented in cooperation with the South Dakota Department of Agriculture & Natural Resources (SD DANR). The drainage basins or watersheds of all three bridges (bridges 50-216-015, 50-219-015, and 50-277-015) have been preliminarily reviewed. All three drainage basins extend north of the bridges, the drainage basin for bridge no. 50-216-015 includes a small portion of the City of Dell Rapids otherwise, all of the bridges' drainage basins consist of mostly rural agricultural land typical of South Dakota with no rural residential developments or large impervious areas that would be uncharacteristic of the regional landscape. The Project will verify endangered and threatened species habitat in proximity to the bridges. For example, the Project has preliminarily been identified in the habitat range of the Topeka Shiner, a type of fish, which was listed by the U.S. Fish and Wildlife Service (USFWS) as endangered under the Endangered Species Act (ESA) in January 1999. The Project will verify Topeka Shiner habitat range and provide temporary diversion channel for safe fish passage as may be necessary.

Furthermore, the Project will be subject to the National Pollutant Discharge Elimination System (NPDES) permit administered by the SD DANR. As the design progresses, the project design team will review the amount of disturbance and new impervious area created with the project to make sure the NPDES requirements are met. The Project improvements include improved erosion and streambank protection, and erosion control best management practices pursuant to the Minnehaha County Project Development and Operations Manual. A list of other required permits are listed in Section VI, Required Approvals.

5. Equity and Quality of Life

Meaningful Public Engagement

As project planning activities progress, Minnehaha County will utilize a public involvement plan for the Project that outlines the recommended tasks associated with public involvement and outreach. The goals of the plan will be to effectively engage community members, conduct targeted outreach, record community inputs, establish appropriate community expectations, and provide clear and consistent communication with identified stakeholders. Outreach format may include hosting a public open house, targeted focus groups, in-person/hybrid/virtual events, direct mailing/emailing, social media, portable message boards, and newspaper ads, etc. The information provided at each event would generally include project information, improvements and benefits, updates, schedule, opportunity for comments and feedback, and links for in-person and virtual engagement.

One of the primary goals of the Project is to sustain the rural quality of life of Minnehaha County residents through Project Planning and Project Investments.

Improving Access to Essential Everyday Needs

The Project is located entirely within a rural agricultural area, in proximity to Dell Rapids (2020 population 3,996), a vibrant small town in northern Minnehaha County. Minnehaha County is the most populous in South Dakota, (2020 population 197,214) comprising 22 percent of South Dakota as a whole (2020 population 886,667). Co. Hwy 104 in the Project area provides a critical link between rural residents of Minnehaha County and Dell Rapids, to meet essential needs impacting quality of life.

Access to Jobs

Along with providing a critical truck freight connection, Co. Hwy 104 corridor also provides essential mobility for people to go about their everyday lives. Using the U.S. Census Bureau's OnTheMap tool, in 2021, 85.8 percent of the 1,970 workers living within a two-mile radius of the Project were employed outside the area, including 33.2 percent traveling to Dell Rapids for work. Regional destinations such as Sioux Falls accounted for 17.7 percent of people traveling outside the Project area for work. Thirty-six and a half percent of people living within the Project area traveled outside to unnamed other locations, consistent with the agriculture-based economy of the area described in Criteria #3. Approximately fifty-six percent had a commute of more than 10 miles one-way, with 11.6 percent traveling more than 50 miles one-way to work. Data from the 2017-2021 American Community Survey show average commute times of 17.8 minutes for Minnehaha County, 24.2 minutes for Census Tract 101.01, and 25.5 minutes for Census Tract 101.02. The average travel time to work for South Dakota is 17.4 minutes.

Based on estimated work locations (OnTheMap), the Project corridor (Co. Hwy 104) provides a critical link between rural residents traveling to Dell Rapids, Sioux Falls, and other rural work locations across the County. Co. Hwy 104 provides critical access to the economy of Dell Rapids, the regional economy, and beyond. The Project sustains Co. Hwy 104 as a Rural Major Collector roadway providing continued mobility and accessibility for people to get to work and sustain quality of life.

Access to Essential Goods & Services

Just as Co. Hwy 104 serves as a critical link to jobs, the roadway also provides critical mobility and access for rural residents along the Project area to healthcare facilities including clinic and hospital, grocery store, schools, places of worship, and other cultural or recreational goods and services in Dell Rapids.

Co. Hwy 104 provides a critical connection to healthcare in Dell Rapids for preventative, specialty, emergency-related services, and assisted living and rehabilitation. The Avera Dells Area Hospital and Clinic provides comprehensive healthcare services and is designated as a Trauma Receiving Hospital by the South Dakota Department of Health (SD DOH), with 24/7 emergency

department coverage. Patients who cannot be treated by the emergency services are transferred to one of the Regional Trauma Hospitals in Sioux Falls, approximately 12-miles to the south. Co. Hwy 104 also serves as a vital roadway for emergency services provided by Dell Rapids Ambulance to rural residents and business operations east of Dell Rapids in northeastern Minnehaha County.

South Dakota's population has increasingly become proportionally older, with 17.3 percent of the state's population aged 65 or older; the Minnehaha County proportion is 13.5 percent, Census Tract 101.01 is 14.5 percent, and Census Tract 101.02 is 17.1 percent of the population aged 65 or older. Youth population aged five or less make up 6.5 percent of South Dakota, 7.3 percent of Minnehaha County, 8.3 percent of Census Tract 101.01, and 5.6 percent of Census Tract 101.02. Mobility to and from Dell Rapids is vital not only for emergency or specialty healthcare, but also for primary care for elderly and youth populations. The Project improvements on Co. Hwy 104 will sustain critical mobility to and from healthcare services including emergency services.

The Project corridor (Co. Hwy 104) connects people to everyday goods in Dell Rapids such as groceries and food. The County Fair Food Store is part of a chain of grocery stores that serves four small towns in South Dakota, including Dell Rapids. The Dell Rapids grocery store provides typical food products including fresh produce and other high quality food items. A 2022 study by the Augustana Research Institute found that in Minnehaha County, an estimated 11.0 percent of people were food insecure, or lacking reliable access to enough affordable, nutritious food. The study also identifies higher rates of food insecurity for households with children, finding that in Minnehaha County, an estimated 17.3 percent of children were food insecure, or not having enough to eat and not knowing where the next meal will come from.

Co. Hwy 104 provides mobility to school facilities for education of student-aged populations (ages 5-18) in Dell Rapids. As of the 2022-2023 school year, the Dell Rapids Elementary School had 393 students, Dell Rapids Middle School had 299 students, and Dell Rapids High School had 290 students. Educational attainment in the Project area is higher than the state average however, the risk of closure of Co. Hwy 104 as an important link in the multimodal transportation system, would pose negative impacts and further barriers between education and affect quality of life.

Equal Opportunity Employer & Affirmative Action

The contract to design and implement the Project will be in accordance with the County's policy on Equal Employment Opportunity. The Minnehaha County Commission supports the principles of equal employment opportunity and affirmative action. In compliance with Title VII of the Civil Rights Act of 1964, consistent with the intent of the South Dakota Human Relations Act of 1972 and SDCL 20-13-10, and in accordance with state and federal law, it is the policy of the County to provide equal employment opportunities to all persons irrespective of race, color, religion or creed, national origin or ancestry, citizenship, sex or gender including pregnancy, sexual orientation and gender identity, marital status, age, disability, veteran's status, genetic information, or any other legally protected status. Adverse or unequal treatment based on these factors is prohibited in regard to all aspects of employment including, but not limited to, recruitment, selection, hiring, promotion, demotion, transfer, layoff, recall, termination, rates of pay or other forms of remuneration, selection for training, and in the offering of employment opportunities, benefits and services.

6. Innovation

Innovative Design

The Project utilizes similar design and construction techniques at all three bridge locations (bridge no. 50-216-015, 50-219-015, and 50-277-015). The Project replaces existing bridges with cast-in-place reinforced concrete box culverts, an innovative approach that fits well in all three locations. Because all three locations are similar, efficiencies will be created in permitting and assessing potential Project impacts.

Additionally, the Project is in proximity to an existing concrete plant and aggregate producer at the Dell Rapids East Quarry, located less than 500-feet away. If concrete and aggregates are used from the Dell Rapids East Quarry, construction of the Project will maximize efficiency of truck travel.

Innovative Delivery

The Project utilizes bundling of the three bridges into a single contract for pre-construction activities as well as for construction. The proximity of the bridges makes it possible to execute these contracts as a single project, thereby, leading to cost and time savings, compared to executing them as three separate bridge projects on Co. Hwy 104. The rural nature of the County and within the Project area, allows for greater standardization and design efficiency, making project bundling the smartest strategy in pursuit of Project procurement and implementation. Furthermore, the Project is pursuing phased obligation of the BIP funds, in order to satisfy applicable administrative requirements, including transportation planning and environmental review requirements, before BIP funds towards construction can be released. Funds towards obligation phase 1, (i.e. preliminary engineering, environmental documentation (NEPA), ROW acquisition, and final design) are committed by Minnehaha County as local match towards this BIP request and will ensure that project delivery advances as expeditiously as possible. Funds obligated in phase 2 will be used towards construction and contingency costs.

Innovative Financing

Minnehaha County recognizes that transportation investments directly and indirectly foster economic growth through the provisioning of construction jobs, enabling goods to be transported through a commerce friendly network of corridors and providing mobility to citizens; the County is committed to investing in roads and bridges that contribute to a growing economy and will continue supporting commerce. The County is bundling the three bridges into a single let project, to utilize efficiencies in engineering design and construction and resulting cost savings.

BENEFIT COST ANALYSIS

The objective of a benefit-cost analysis (BCA) is to bring all the direct effects of a transportation investment into a common measure (dollars), and to account for the fact that benefits accrue over an extended period while costs are incurred primarily in the initial years. The primary elements that can be monetized are travel time, changes in vehicle operating costs, vehicle crashes, environmental impacts, remaining capital value, and maintenance costs. The results of the BCA are briefly summarized below. A detailed technical memorandum of the analysis is attached and available to view at the grant application website: https://www.srfconsulting.com/minnehahahighway104_bip/

No Build Alternative

The No Build Alternative assumed that no major rehabilitation work would be undertaken on any of the Co. Hwy 104 bridges associated with the project. The bridges were expected to be load posted and closed to traffic in future years based on current bridge conditions and remaining service life. The remainder of the transportation network assumed no changes relative to its existing layout.

Build Alternative

The Build Alternative included the reconstruction and rehabilitation activities noted in the project description section of the application. Maintenance costs associated with the bridges were expected to be incurred over the benefit cost analysis period. Like the No Build, no other improvements were considered for the Build Alternative in the analysis.

BCA Methodology

The following methodology and assumptions were used for the benefit-cost analysis.

Main Components - The main components analyzed included:

- Travel time/delay
- Vehicle operating costs
- Crashes by severity
- Environmental and air quality impacts
- Initial capital costs: Capital costs were expected to be incurred in years 2028 through 2029
- Remaining Capital Value: The remaining capital value (value of improvement beyond the analysis period) was considered a benefit and was added to other user benefits.
- Operating and maintenance costs

Project Costs

Year 2022 Project costs for the BIP components of the overall Project are expected to be about $3.8 million. The current 2022 project costs discounted at a rate of 3.1 percent is approximately $3.1 million.

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 8, with detailed documentation presented in the technical memorandum and workbook.

Table 8 Total Project Results

	Initial Capital Cost (2022 Dollars)	Project Benefits (2022 Dollars)	Benefit-Cost Ratio (3.1% Discount Rate)	Net Present Value (2022 Dollars)
No Build vs. Build	$3.1 million	$74.9 million	24.1	$71.8 million

Additionally, the Project benefits under various categories results in the cost benefits/savings listed in Table 9.

Table 9 Project Benefits

Benefit Categories	Benefit (2022 Dollars)
Travel Time	$15,237,000
Vehicle Operating Costs	$13,896,000
Safety	$13,896,000
Air Quality	$6,396,000
Maintenance	($31,000)
Remaining Capital Value	$613,000
Total	**$36,111,000**

PROJECT READINESS & ENVIRONMENTAL RISK

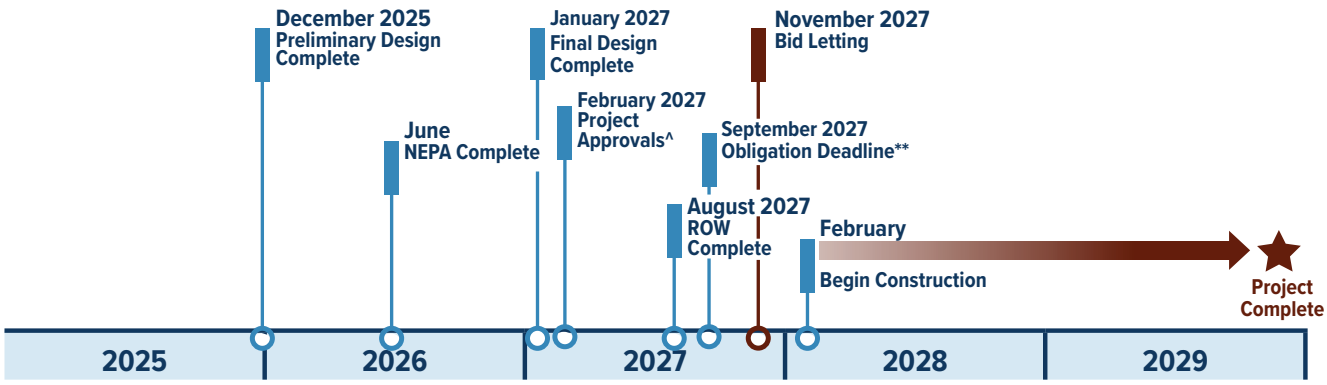
Technical Feasibility and Technical Competency

The Project is well positioned to begin construction on schedule in 2028. As referenced throughout the Project narrative, preliminary engineering, environmental documentation (NEPA), final design, project approvals, and ROW acquisition will be part of phase 1, with obligation prior to September 30, 2026. Construction is part of phase 2, with obligation prior to September 30, 2028. The technical challenges are well understood as Minnehaha County has completed similar facilities across the county's multimodal transportation system and already completed a Bridge Type Study. Based on experience with similar projects, the County is prepared to handle cost overruns if they should occur, through the Minnehaha County Highway Fund however, an eight percent contingency rate has been built into the Project cost estimate, which is stable and recently developed planning-level cost estimate. This Project requires minimal right-of-way acquisition and project approvals are well understood. Minnehaha County has an exemplary record of completing project milestones on schedule and has the technical capacity to successfully deliver the Project on time and on budget.

Project Schedule

The Project schedule identifying major milestones is presented below. All planning agreements, review periods, and approvals have been considered. Minnehaha County will be prepared to begin construction in Spring 2028 and will be completed in Fall 2029. The Project requires minimal ROW. There are minimal project risks associated with the Project as indicated throughout the Project narrative.

Figure 19 **Project Schedule**



** Project obligation deadline for FY 2024 funds is September 30, 2027.
^ Bid Ready Final Design Package Including Permits and Final Project Approvals

Required Approvals

Environmental Permits & Reviews

Pursuant to the SDDOT's Environmental Procedures Manual, Minnehaha County will follow a Categorical Exclusion (CE), NEPA compliant, environmental review process for the Project and has preliminarily identified required permits and approvals. Required approvals will be fully understood and refined through the preliminary engineering and environmental documentation process however, the County has identified critical approvals in the Bridge Type Study.

Permits/Approvals	Agency	Action Required (Status)
Categorical Exclusion	SDDOT Environmental Office	To be completed
Cultural Resource Survey	SDDOT Environmental Office	To be acquired
Section 404 Permit	U.S. Army Corp of Engineers (USACE)	To be acquired
USACE 2021 Regional Conditions	USACE	To be acquired
Notice of Intent	South Dakota Department of Agriculture and Natural Resources (SD DANR)	To be acquired
Floodplain Permit	Minnehaha County	To be acquired
National Pollutant Discharge Elimination System (NPDES) Permit	SD DANR	To be acquired

State and Local Approvals

There is a broad base of support for the Project, as shown by the Letters of Support submitted as part of this application. The Project closely aligns with the goals, objectives, and policies of the County's Comprehensive Plan and the Highway Department's Strategic Plan. The Project is not currently programmed in the SDDOT's 2024-2027 Statewide Transportation Improvement Program (STIP). The Project is outside of the Metropolitan Planning Area of Sioux Falls therefore, the Project is not included in the 2024-2027 Transportation Improvement Program. Portions of the Project are already programmed in Minnehaha County's current 2024-2028 Transportation Improvement Plan. The County's current Transportation Improvement Plan includes the following portions of the Project:

- 2027
  - 50-216-015: $14,358 of local funding for design
  - 50-219-015: $15,329 of local funding for design
  - 50-277-015: $29,982 of local funding for design
- 2028
  - 50-216-015: $106,246 of local funding for construction
  - 50-219-015: $113,433 of local funding for construction
  - 50-277-015: $221,866 of local funding for construction

Upon award of BIP funding, the Project's associated phases (design/construction) will be amended into the County's current Transportation Improvement Plan and subsequent Transportation Improvement Plans through obligation and construction. Additionally, upon award of BIP funding, the Project will be included in the STIP through annual development cycle and/or amendment. The Project will remain programmed in the STIP through obligation (i.e., 2025-2028 STIP).

Federal Transportation Requirements Affecting State and Local Planning

As summarized above. Through obligation of BIP funds, the Project would be programmed into the STIP as applicable. Obligation phasing and any revisions associated with the completed final design and/or BIP award and subsequent grant agreement will be reflected in the STIP pursuant to 23 CFR § 450.218.

Assessment of Project Risks and Mitigation Strategies

Minnehaha County will maintain a register of risks and mitigation strategies as the project progresses through preliminary engineering, environmental documentation, ROW acquisition, and design. The County has completed risk assessments for similar projects across the multimodal transportation system to be able to anticipate and mitigate risks to the Project's schedule and cost. The risk assessment includes identifying the probability the risk occurs, identifying the impact of the risk, and calculating a severity that combines the probability and impact. Based on the risks identified, mitigation methods will also be identified.

With an proactive approach taken, Minnehaha County does not anticipate any potential risks to significantly alter the Project's schedule or costs.

ADMINISTRATION PRIORITIES AND DEPARTMENTAL STRATEGIC PLAN GOALS

The Project will advance the USDOT's priority policy areas of equity, climate change and sustainability, and safety.

Safety

As summarized in Section IV Subsection 2, the Project makes the multimodal transportation system safer for all people by proactively addressing outdated, substandard bridge guardrail and railing components which increase the risk of serious injury and death on Minnehaha County roadways. As traffic continues to grow on Co. Hwy 104, the Project design is more resilient to human mistakes and vulnerability, by extending the structural components of the new bridges outside of the clear zone, away from the travel lane, while also providing recoverable ditch slopes for dangerous rural run off road crashes. The Project aligns and forwards the National Roadway Safety Strategy (NRSS) through a holistic and comprehensive replacement of three critical bridge assets on Co. Hwy 104 in Minnehaha County.

Climate Change and Sustainability

The Project reduces emissions and improves resilience of the multimodal transportation system. Section IV Subsection 4 identifies reductions of greenhouse gas emissions in the transportation sector resulting from Project implementation. Approximately 28,467 metric tons of greenhouse gasses will be eliminated by constructing the Project, by avoiding load posting and closure and reducing VHT. The current bridges are currently in poor condition (bridge no. 50-216-015 and 50-219-015) and fair condition (bridge no. 50-277-015) but at risk of falling into poor condition by the year 2026. As shown in Section I Figure 6, the detour route increases VMT and VHT significantly through the Project area. As part of a rural multimodal transportation system with limited circuity and parallel routes, even the load posting and closure of one of the three bridges will have major consequences for increased greenhouse gas emissions.

Minnehaha County will develop the Project through a thorough, NEPA compliant environmental review process to avoid and as applicable, mitigate adverse impacts to air or water quality, wetlands, and endangered species. The environmental documentation process includes an environmental justice analysis consistent with presidential Executive Order 14008.

Equity

As described in Section IV Subsection 5, the Project will reduce inequities across the multimodal transportation system, and surrounding communities impacted by the Project. One of the primary goals of the Project is to sustain the rural quality of life of Minnehaha County residents through Project Planning and Project Investments. The Project sustains rural quality of life for populations within and travelling along the Project corridor by improving safety, mobility, and reliability of Co. Hwy 104 as a critical Rural Major Collector. The project avoids load posting and closure, which would severely hinder access to jobs, essential needs, and everyday destinations to sustain quality of life in the Project area and beyond.

Given the minor impacts of the Project, Section VI identifies the Project will be subject to a Categorical Exclusion environmental review process, identified for "a category of actions that do not individually or cumulatively have a significant effect on the human environment..."(SDDOT. Environmental Procedures Manual. Pg 2-14). The Project will not have disproportional or adverse impacts to populations in the Project area. Minnehaha County will also implement a public involvement plan for the Project that outlines meaningful tasks associated with including people from all walks of life in the Project development process.

Workforce Development, Job Quality, and Wealth Creation

Minnehaha County will follow their Equal Employment Opportunity (EEO) policy to create an inclusive environment with a commitment to equal opportunity, as further described in Section IV Subsection 5. The contract to design and implement the Project will be in accordance with the County's policy, which supports the principles of equal employment opportunity and affirmative action therefore, above and beyond compliance with Federal law. Minnehaha County's EEO policy is consistent with USDOT's Equity Action Plan to include local economic development and entrepreneurship as well as equal opportunities for Disadvantaged Business Enterprises (DBE), Minority-owned Businesses, Women-owned Businesses, or 8(a) firms.

DOT PRIORITY SELECTION CONSIDERATIONS

As addressed throughout the Project narrative above, there are several priority selection considerations associated with the Project.

- As summarized in Section I and Section IV Subsection 1, the Project replaces a bundle of three bridges, two of which (bridge no. 50-216-015 and 50-219-015) are in poor condition, one of which (bridge no. 50-277-015) is in fair condition and, according to FHWA's LTBP condition forecast tool, is at risk of falling into poor condition within three years.
- The local share of the Project is funded through the Minnehaha County Highway Fund. Minnehaha County's Highway Fund is the only county highway fund in South Dakota that is not subsidized nor does not receive revenue from the County's General Fund (Property Tax), as described further in Section IV Subsection 1: Operations and Maintenance Funding. The County would be unable to complete the Project if not but for a BIP grant.

The Project also meets the following characteristics:

- The Project will be ready to proceed to the next stage of project delivery (final design) within 12 months of a CE Determination, as outlined in Section VI.
- The Project includes accommodation for bicycles and pedestrians by paving up to a four-foot shoulder across the bridges. As the first link in a rural, regional multimodal system, the Project will lead to construction of new bike and pedestrian infrastructure to accommodate vulnerable roadway users safely and at a reasonable cost to the Project.
- The contract to design and implement the Project will be in accordance with the County's EEO policy, which supports the principles of equal employment opportunity and affirmative action therefore, above and beyond compliance with Federal law. Minnehaha County's EEO policy is consistent with USDOT's Equity Action Plan to include local economic development and entrepreneurship as well as equal opportunities for Disadvantaged Business Enterprises (DBE), Minority-owned Businesses, Women-owned Businesses, or 8(a) firms.
- As described in Section III, if BIP funding is not awarded, the Project would be significantly delayed from its existing schedule, unlikely to commence before September 30 of the fiscal year plus three years. As a result, immediate reconstruction/rehabilitation is recommended to maintain safe levels of service and operations along Co. Hwy 104.

SUPPORTING DOCUMENTS

Links to supporting documents are included throughout this narrative. All supporting documents and the BIP grant application narrative are available to view at the following webpage:

https://www.srfconsulting.com/minnehahahighway104_bip/