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Reconstruction of Interstate 29 Exit 69 Bridges

FY 2024 Bridge Investment Program (BIP) Discretionary Grant

Project Name	Reconstruction of Interstate 29 Exit 69 Bridges
Project Type	Bridge Project under $100 million
Future Eligible Project Costs	$65.0 million
2024 BIP Funds Requested	$32.5 million

Primary Contact:
Scott Zainhofsky, Division Director, Planning & Asset Management
North Dakota Department of Transportation
608 East Boulevard Avenue, Bismarck, ND 58505-0700
(701) 328-2642 | nddotgrants@nd.gov | www.nd.gov

Supporting Information can be found at:
www.srfconsulting.com/nddot_i29_exit69_bip/

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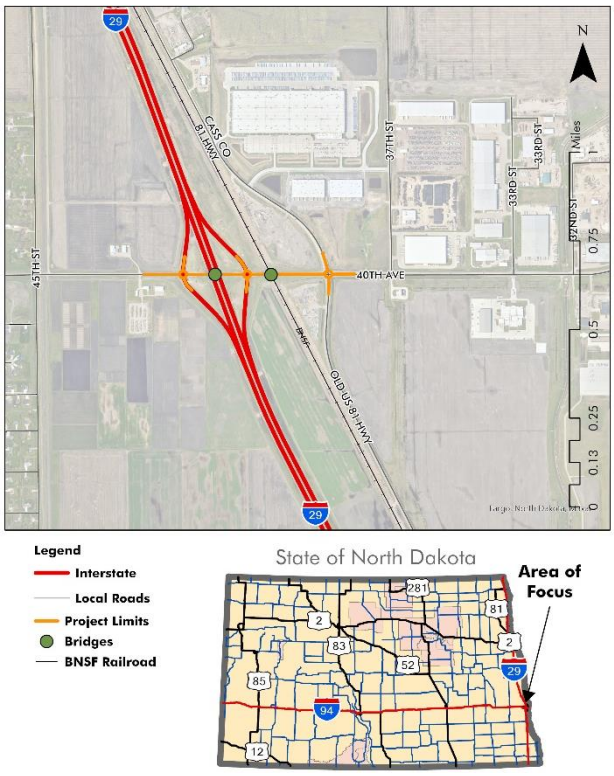
I. BASIC PROJECT INFORMATION

Project Description

Figure 1. Project Location



The North Dakota Department of Transportation (NDDOT) is requesting $32.5 million in FY 2024 Bridge Investment Program (BIP) funds to reconstruct the Interstate 29 (I-29) Exit 69 Bridge Replacement Project (hereafter referred to as the "Project"). The Project includes reconstruction of the two bridges, structure numbers 29-69.374 and 29-69.374 N along 40th Avenue North (40th Ave. N.) in Fargo, ND, over I-29 and the BNSF Railway directly east of the northbound I-29 on and off ramps, respectively, and associated roadway improvements to match the revised bridge profiles. The Project's total future eligible cost is $65 million 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.

Bridge number 29-69.374 was built in 1966 and bridge number 29-69.374 N was built in 1965. Both bridges were constructed as part of the original Interstate System in North Dakota, and provide a critical connection to Fargo, ND. Formerly known as Cass County Road 20 (CR 20), 40th Ave. N. is now within Fargo city limits and is now the City's jurisdiction within the Urbanized Area (UZA) boundary. As Fargo's northern-most major east-west roadway, 40th Ave. N. is a significant driver of emerging intermodal freight, heavy commercial, industrial, and regional growth.

Bridge number 29-69.374 provides grade separation of 40th Ave. N. over I-29, which is a part of the National Multimodal Freight Network, National Highway Freight Network, Primary Highway Freight System and is considered one of the most critical highway segments of the U.S. freight transportation system and directly connects the U.S. and Canada at the Pembina-Emerson Port of Entry. Structure 29-69.374 N provides grade separation of 40th Ave. N. over the BNSF railroad. This specific BNSF railroad is part of the Strategic Rail Corridor Network (STRACNET), a critical line of rail between military defense sites, and runs between three of the top five agricultural commodity producing counties in the state (2022, by dollar value), including Cass County (first), Grand Forks County (fifth), and Walsh County (fourth). The bridges associated with the Project are approximately 550-feet apart, from bridge deck to bridge deck, and operate as a critical system at the I-29 Exit 69 interchange.

Fargo, and the surrounding region (Fargo, ND-MN Metropolitan Statistical Area) is the largest economic, research, and recreational hub in North Dakota, producing 34.3 percent of the state's total Gross Domestic Product (GDP) in 2022. Recent major industrial and logistics, intermodal air cargo expansion, and emergency management projects have accelerated growth in critical economic development sectors around the Exit 69 interchange and 40th Ave. N., with continued growth forecast through the next 26 years. Reconstruction of the bridges will bring both functionally obsolete structures up to current standards to sustain rapidly growing and projected multimodal traffic, improve safety, and enhance multimodal mobility at arguably one of the most critical interchanges in North Dakota. The Project is critical to accommodate

this impending growth and will replace existing structures on 40th Ave. N. over I-29 and BNSF railroad to provide necessary roadway and intersection capacity, bring both structures into a state of good repair, and accommodate multimodal mobility. The Project also reconfigures the existing Exit 69 diamond interchange to a dumbbell interchange to accommodate traffic operations and improve safety.

Current Transportation Challenges

Traffic Operations

Current and future development growth on either side of I-29 Exit 69 in the Project area is driving more and more traffic across both bridges on 40th Ave. N. Given the age of the structures and standards of original construction of the bridges in the 1960s, the bridges and subsequent 40th Ave. N. interchange with I-29 are approaching capacity and experiencing negative transportation operations impacts, decreased mobility and reliability, and safety risks. Traffic operations are degrading as traffic is forecast to grow through 2045. The significant growth in traffic volumes is negatively impacting traffic operations, causing advanced degradation of both structures, and is exacerbating all transportation challenges in the Project area as the bridges cannot accommodate traffic operations improvements in their existing state (Table 1).

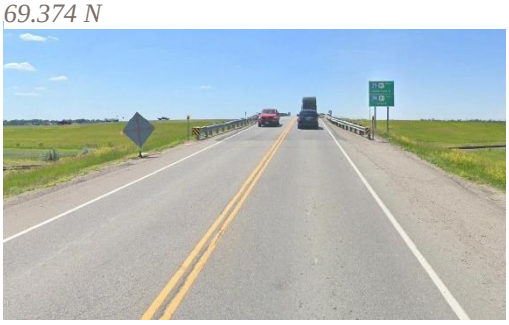
Table 1. Traffic Growth at I-29 Exit 69

AADT Year	40th Ave. N.		I-29		I-29 Exit 69 Ramps			
	West of I-29	East of CR 81	North of 40th Ave.	South of 40th Ave.	NB Exit	NB Entrance	SB Exit	SB Entrance
Existing[1]	3,210	8,290	21,850	22,670	3,555	430	410	3,385
2045[2]	15,200	18,300	23,000	33,000	6,500	800	750	6,250
CAGR[3]	7.0%	3.5%	1.9%	1.9%	2.5%	2.5%	2.5%	2.5%

Safety

In the Project area, there were 39 total crashes between 2014 and 2023 including two minor injury and seven possible injury crashes. The most common (54 percent) were rear end crashes, symptomatic of the increased traffic volumes and poor sight distances across the Project area. Sight distance is a primary factor of safety challenges at the Exit 69 interchange, caused by the steep grade of 40th Ave. N. over I-29 and the BNSF railway. With six cross-traffic conflict points, growing traffic, and sight distance deficiencies, the crash rate in the Project area is expected to rise. Given the age and rural design of the structures, the width of the bridges provide no space for critical traffic operational improvements necessary to safely move traffic through the Project area.

Figure 2. View Westbound over Bridge 29-69.374 N



The risk for wrong-way crashes in the Project area is well known and has led to tragic loss of life along I-29 at other similar diamond interchanges just north of the 40th Ave. N. interchange. Because of the vertical alignment, bridge proximity, and confusion caused at Exit 69, NDDOT recognizes safety as a crucial challenge in the Project area that requires immediate resolution therefore, programmed the installation of a wrong way detection system utilizing intelligent transportation system (ITS) elements at this location in 2024.

Condition

The condition of both structures is fair however, there are signs of rapid deterioration that will place both bridges into poor condition within the next three years. The most recent bridge inspection reports for

structure 29-69.374 over I-29 and structure 29-69.374 N over the BNSF railroad note several identical deficiencies including concrete cracking in the deck and abutments, rusting of the steel girders, approach settlement, and erosion/undermining at the abutments. According to research performed by FHWA's Long-Term Bridge Performance Program (LTBP), bridge 29-69.374 is at risk of falling into poor condition within three-years, by 2027. Bridge 29-69.374 N is at risk of falling into poor condition within four-years, by 2028. However, neither LTBP forecast considers the latest 2023 condition ratings with the forecast start date of 2024 therefore, the forecast model may be underestimating deterioration of the bridges at the Project location by modeling the 2024 forecast based upon 2021 bridge conditions, and not the 2023 bridge conditions. NDDOT believes that both bridges are at significant risk of falling into poor condition within three years.

The most recent inspection report for structures 29-69.374 and 29-69.374 N found the following significant findings:

- Undermining of abutments.
- Erosion and undermining of piers.
- Undermining of footings.
- Rusting of connection plates and soffits.
- Exposed H-Pile.
- Spalling with exposed rebar, rust staining, and delamination.
- Longitudinal and vertical cracking along underside of decks and abutments.
- Rusting to bare metal girders, 75 percent loss of effectiveness and/or peeling and bubbling.
- Moderate spalling with exposed rebar to portions of the north and south curb near the corners and throughout with various posts delaminating and exposing reinforcing steel.

Figure 3. 29-69.374 Column Delamination

Bridge structure 29-69.374 N currently does not meet minimum vertical clearance requirements established by NDDOT and BNSF. The current vertical clearance is 23-feet however, since 1965, BNSF revised the standard to 23.5-feet. Bridge structure 29-69.374 is higher than the minimum vertical clearance over I-29 however, widening the structure to add critical capacity improvements was determined infeasible, as it would result in minimum vertical clearances less than 17-feet.

Figure 4. 29-69.374 N Curb/Rail Soffit Exposed Rebar

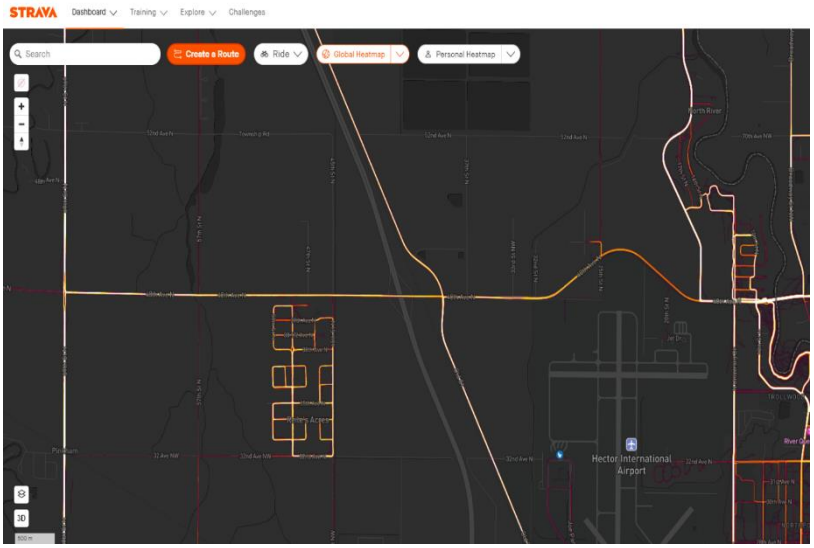
Both structures are experiencing deterioration, exacerbated by age and historic design standards as well as growing traffic volumes. The deteriorating structural condition of the bridges in the Project area will lead to structural deficiencies that increase the likelihood of NDDOT load posting or closing the bridges. Load posting and closure of the bridges would have devastating consequences to mobility and reliability, and safety on I-29, the BNSF railroad, and 40th Ave. N. through the Project area.

Multimodal Mobility

Currently, there are no existing bicycle or pedestrian facilities in the area however, 40th Ave. N. is identified in the Fargo-Moorhead Metropolitan Council of Governments Metropolitan Bicycle and Pedestrian Plan as

a recommended corridor for new and updated facilities. The Project area is within the UZA, and a significant growth area for the region. Demand for bicycle and pedestrian facilities through the Project area continues to mount, as development continues on both sides of Exit 69. Therefore, bicycle and pedestrian paths will be included in the project.

Figure 5. Strava Global Heat Map (Cyclists)



Proposed Improvements

The proposed Project improvements include:

- Removing existing bridges.
- Reconstructing bridges 29-69.374 (over I-29) and 29-69.374 N (over BNSF railroad) to accommodate improved traffic operations and to a state of good repair.
- Reconstructing bridges to safe and current modern standards including:
    - Bridge railings
    - Transitions
    - Approach guardrail
    - Bridge guardrail ends
- Reconstructing approximately 0.7-miles of 40th Ave. N. through the Project area, from west of the I-29 southbound ramps intersection to east of the Cass County Road 81(CR 81) intersection.
    - Grading alignment to accommodate grade change and increased vertical clearances to nearest practical tie-down points as shown here.
- Reconfiguring roadway geometry to three travel lanes with raised median (two westbound, one eastbound) across bridges to sustain current and future traffic volumes.
- Reconfiguring intersection with CR 81 to a roundabout to sustain current and future traffic volumes.
- Constructing a new grade separated shared use path along north side of the bridges and the roadway.
- Reconfiguring I-29 Exit 69 diamond interchange as a dumbbell (roundabout) interchange to sustain traffic operations and improve safety.
- Upgradation of pavement markings and signage throughout.
- Bicycle and pedestrian paths, within the project limits and across both bridges.

Project History

The Project area has been identified as a Fargo growth area since 2007, as shown in the City's *Growth Plan 2007*. Since then, transportation system improvements for the Project were specifically identified in the following plans, with recommendations being refined over time:

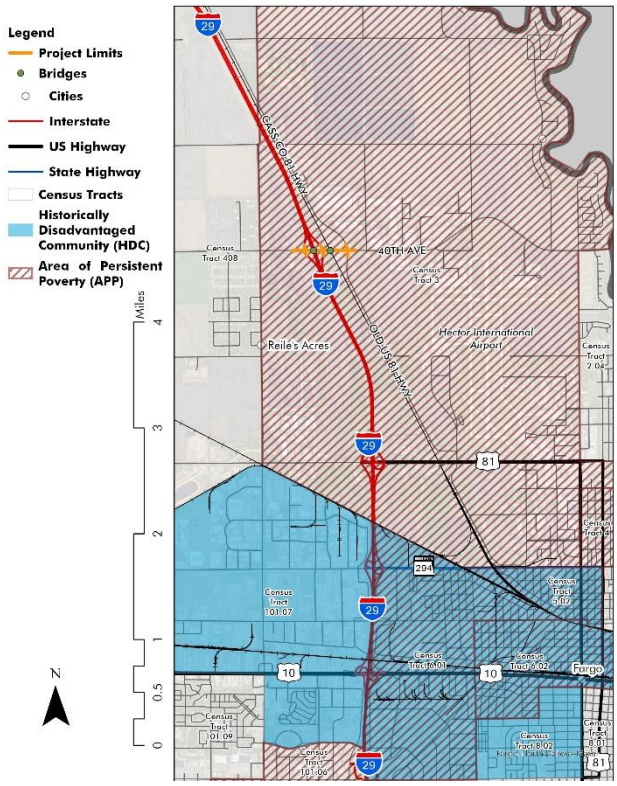
- *Metro Grow: 2045 Fargo-Moorhead Metropolitan Transportation Plan* (2019)
- *Northwest Metro Transportation Plan* (2020)
- *Interstate Operations Analysis & Plan for Future Development* (2023)

Metro COG's Interstate operations study identifies the Project as a near term implementation step (implementation 2023-2030). So far, NDDOT has incurred costs of approximately $3.3 million for delivery of the Project.

Project Location

The Project is located along 40th Ave. N. at I-29 Exit 69 in Fargo, ND from west of the southbound I-29 ramps to just east of CR 81. 40th Ave. N.'s functional classification is Major Collector through the Project area and becomes a Minor Arterial east of CR 81. The Project is located at approximately 46.934175°N, -96.855161°W on the west, and 46.934069°N, -96.841675°W on the east.

Figure 6. Context Location



The Fargo Growth Plan 2024 (currently being developed) shows the Project within one of the only current greenfield growth areas of Fargo. Plans for the past 17 years have identified the area east of the Project as future industrial land use, which continues to build out. West of the Project, the Northwest Metro Transportation Plan identified the area for future industrial and neighborhood-residential land uses, with land entitlement processes already occurring ahead of forthcoming development. The southwest quadrant of the I-29 Exit 69 interchange is land owned by North Dakota State University for agricultural research. Some of the growth areas in proximity to the Project are within the 100-year flood plain and will remain undeveloped until after the Fargo-Moorhead Flood Diversion regional flood protection project is operational (estimated to be completed in 2027 or 2028). The flood diversion project will open most of the northern regional growth area to development by removing the 100-year flood plain, putting significant pressure on 40th Ave. N. as a major freight and passenger corridor.

Of the land that is developable (outside of the flood plain), growth has been explosive in the Project area. Just east of the Project (0.2-miles), and north of 40th Ave. N. is Fargo's largest industrial growth area, primarily made up of logistical and supply-chain oriented businesses and other heavy commercial businesses. The industrial growth includes Fargo's Amazon Fulfillment Center, the largest building in the state at 1.2 million square feet. Also to the east, just south of 40th Ave. N. are critical intermodal, air-freight related developments. 40th Ave. N. aligns east-west along the northern boundary of Hector International Airport, which is home to critical intermodal air cargo operations and other air-related uses with hangars and warehouses including United Parcel Service (UPS) Air Cargo, Bemidji Aviation Services, Federal Express (FedEx) Air Cargo, North Dakota National Guard Readiness Center, North Dakota Army National Guard Armory, Army National Guard Battalion Headquarters, Fargo Jet Center, and U.S. Customs and Border Protection Port of Entry.

Urbanized Area (UZA)

The Project is located within the Fargo-Moorhead UZA and the Metropolitan Planning Area (MPA) of Metro COG, the Metropolitan Planning Organization (MPO) for the region. According to the U.S. Census Bureau's 2020 Decennial Census, the total UZA population is estimated to be 216,214.

Disadvantaged Communities

As shown in Figure 6 the Project is located entirely within a designated Area of Persistent Poverty (APP), Cass County Census Tract 3. No portion of the Project is within a Historically Disadvantaged Community (HDC) however, the Project is located less than two miles north of two HDCs, Cass County Census Tracts 6.01 and 101.7. There are no Federally designated community development zones (Opportunity Zones, Empowerment Zones, Promise Zones, or Choice Neighborhoods) within one mile of the Project.

Lead Applicant

NDDOT is the lead applicant for this project and the proposed BIP grant recipient. Originally called the State Highway Department, the NDDOT was established in 1917. The Department is an innovative and progressive organization with a team of employees that work hard across the state to carry out its mission to safely move people and goods. The Reason Foundation, based on 13 criteria ranging from safety, to infrastructure condition, to congestion, ranked NDDOT and the state's highway system as the 9th most cost-effective DOT in the nation for 2023.

Primary Contact
Scott Zainhofsky, Division Director
NDDOT, Planning & Asset Management
608 East Boulevard Avenue
Bismarck, ND 58505-0700
(701) 328-2642
nddotgrants@nd.gov | www.nd.gov

The NDDOT strives to build and maintain an efficient transportation system consisting of over 8,500 miles of roadway and approximately 1,700 bridges. It oversees the development of surface transportation including highways, bridges, rail, transit, pedestrian, and bicycle paths across the state. The Department has significant experience managing Federal-aid highway program funds, as well as the administration of federal discretionary grants. In the past five years, the NDDOT has received and properly managed more than 15 federal grants from several federal agencies.

Other Public and Private Parties

The City of Fargo and Cass County are additional public parties who are financially committed to delivering the Project outside of NDDOT right-of-way (ROW) as shown here. While NDDOT leads the Project, City of Fargo and Cass County are funding partners that will be involved in plan reviews and in Project steering committee meetings throughout project development. The Project has received wide-ranging support from various public and private organizations including documented letters of support from the following: ND Governor (Burgum), U.S. Senators (Cramer and Hoeven), U.S. House of Representatives (Armstrong), the Fargo-Moorhead Metropolitan Council of Governments (Metro COG), Cass County, and the City of Fargo.

Additional Eligibility Requirements

Maintenance Commitment

Maintenance of the Project will be funded and managed by NDDOT. The Department will perform routine inspection and maintenance of the structures within its right-of-way. Contracted maintenance will be provided through NDDOT's Federal Formula funds as programmed for maintenance projects across the state. Operations, maintenance, and major rehabilitation activities are anticipated throughout the life cycle of the Project. NDDOT's Maintenance Operations Manual guides specific activities for bridge preservation. The Project will undergo cyclical and condition-based maintenance activities through the life cycle of the structures (anticipated to be 75 years). NDDOT is committed to funding bridge preservation activities for the Project. The operations and maintenance of Project components outside NDDOT's right-of-way will be performed by appropriate agencies for their respective jurisdictional portions.

Bicycle & Pedestrian Accommodation

The Project is along 40th Ave. N., which allows bicyclists and pedestrians to operate however, currently there are no existing active transportation facilities. 40th Ave. N. and CR 81, which runs north-south on the east Project termini for example, are popular on-street bicycle routes in the region. The Project will construct a grade separated shared use path on the north side of 40th Ave. N. across both bridges. The grade separation will provide the safest option to accommodate bicycle and pedestrian facilities on the north side through the interchange and over the bridges given the 40-miles per hour (mph) speed limit and the proposed dumbbell (roundabouts) interchange configuration. The shared use path facility will follow guidance from the *Fargo-Moorhead Metropolitan Bicycle and Pedestrian Plan*, *ND Moves: Statewide Active and Public Transportation Plan*, and the American Association of State Highway and Transportation Officials (AASHTO) *Guide for the Development of Bicycle Facilities*.

II. NATIONAL BRIDGE INVENTORY DATA

Detailed information from the National Bridge Inventory database is provided for each bridge here. The data was obtained using the FHWA's NBI database as recommended in the NOFO, which provided information for the bridges from a July 2021 inspection. The North Dakota Department of Transportation performed a routine 24-month inspection on July 17, 2023, which noted revised information for Item 58 – Deck Condition, Item 90 – Inspection date, and for structure 29-69.374 N, also Item 60 - Substructure. The original and revised data for these line items are noted below:

Table 2. Change in NBI Bridge 0029069374

Item No.	NBI Data – July 2021	NDDOT Revised Data – July 2023
58 – Deck Condition	6 (fair)	5 (fair)
90 – Inspection Date	July, 2021	July 17, 2023

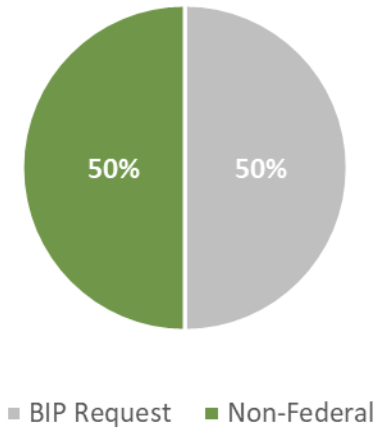
Table 3. Change in NBI Bridge 0029069374

Item No.	NBI Data – July 2021	NDDOT Revised Data – July 2023
58 – Deck Condition	6 (fair)	5 (fair)
60 – Substructure	7 (good)	6 (fair)
90 – Inspection Date	July, 2021	July 17, 2023

III. PROJECT BUDGET

Total Future Eligible Project Cost: $65 million

Figure 7. Project Funding Breakdown



BIP Request Amount: $32.5 million (50 percent of total future eligible project cost)

Availability and commitment of funding sources:

The total future eligible Project cost is $65 million which includes construction, construction delivery, contingency and inflation costs. The construction is estimated to start in March 2028 and end in December 2029. However, the Project can be let earlier if funding is fully secured through the award of this BIP request. Detailed construction cost estimate for the Project has been prepared and can be found here. The cost estimate is based on a 15 percent preliminary design and reflects bid pricing for the year 2024. It accounts for a 20 percent contingency to cover any unexpected costs and an annual inflation

of 8.2 percent until the mid-point of construction. North Dakota Department of Transportation has spent approximately $3.3 million to date in previously incurred costs on preliminary design and environmental documentation to advance project delivery. The City of Fargo has committed to contribute $4.6 million towards the Project in ineligible cost that includes construction and inflation.

Sources

Non-Federal (State and Local Funds)

Cass County, the City of Fargo, and the NDDOT have committed to providing $32.5 million (50 percent of total future eligible costs) in non-federal funds. County funds will come from the Cass County Road and Bridge Fund, and City of Fargo funds will come from Special Assessments and Sales Tax Revenue. NDDOT will provide funding through the Flexible Transportation Fund to be invested for infrastructural improvements of bridges along 40th Avenue N. The funding for preliminary engineering and environmental clearance were programmed in the Statewide Transportation Improvement Program (STIP). However, due to the increased cost of inflation, additional funding is required to completely fund the project. Table 4 presents the detailed funding breakdown, including cost and source of funding for each major project activity, both in dollars and percentages.

Table 4. Project Funding Breakdown

Project Components		Project Funding								Total Cost Estimate
		Federal Funding		Non-Federal						
		BIP		NDDOT *		Cass County		City of Fargo		
		Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent	
Ineligible Costs	Pre-construction Activities - Environmental Assessment - Preliminary Design - Final Design - Right-of-Way Acquisition	$0		$3,300,000		$0		$0		$3,300,000
	Construction (non-BIP) costs incl. inflation	$0		$0		$0		$4,600,000		$4,600,000
	Total Ineligible Costs	**$0**	**0%**	**$3,300,000**	**42%**	**$0**	**0%**	**$4,600,000**	**58%**	**$7,900,000**
Eligible Costs	Construction costs incl. contigency	$21,900,000		$19,500,000		$1,200,000		$1,200,000		$43,800,000
	Inflation	$10,600,000		$10,600,000		$0		$0		$21,200,000
	Total Future Eligible Costs	**$32,500,000**	**50%**	**$30,100,000**	**46%**	**$1,200,000**	**2%**	**$1,200,000**	**2%**	**$65,000,000**
	BIP Request	$32,500,000	50%	**Total Project Cost**						**$72,900,000**
	Other Federal	$0	0%							
	Non-Federal	$32,500,000	50%							

*NDDOT has the flexibility, if necessary, to cover any potential cost overruns by reallocating either additional Flexible Transportation Fund money, or Federal formula funds.

Table 5 presents the cost per bridge if the Project is not bundled. The bundling of the bridges will lead to an estimated cost saving of 13 percent due to increased efficiencies in construction, material procurement, and construction delivery.

Table 5. Unbundled Project Costs

Project Components		Unbundled Cost				Total Unbundled Cost
		0029069374		0029069374 N		
		Dollars	Percent Total	Dollars	Percent Total	
Eligible Costs	Construction costs incl. contigency	$25,185,000		$25,185,000		$50,370,000
	Inflation	$12,190,000		$12,190,000		$24,380,000
	Total Future Eligible Cost	**$37,375,000**	**50%**	**$37,375,000**	**50%**	**$74,750,000**

The future eligible costs of the Project will be funded with 50 percent grant funds and 50 percent non-federal funds (Table 4). As documented in the letter from the NDDOT's Director, the department is

committed to matching the funds required for the Project. The state's share of the budget will be funded from one of the following sources:

- The Flexible Transportation Fund established by the 68th ND Legislative Assembly with Senate Bill 2113. The fund was created to, among other things, provide match for federal grant funding obtained by NDDOT.
- House Bill 1012 gives the NDDOT the appropriations for matching funds on projects that have been awarded grants.

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. The NDDOT may pursue funding under other federal programs as they become available, if this BIP funding request is not awarded. The bundling of the two bridges along 40th Ave. N. together leads to a total saving of approximately $9.8 million compared to constructing them under separately bid projects. As mentioned previously, the Project budget accounts for sufficient contingency amounts to cover unanticipated cost increases.

BIP Funding Needs

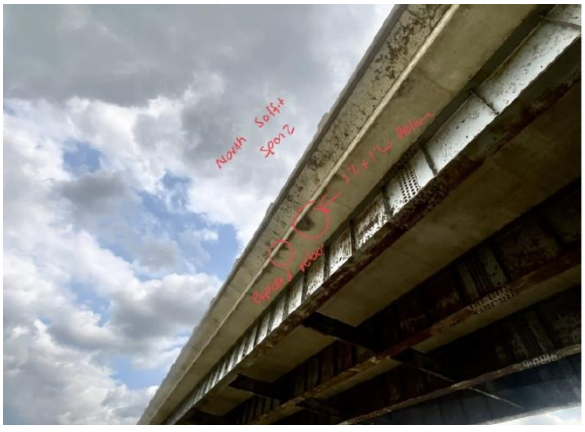
If the BIP funding is not awarded, the Project will be significantly delayed from its existing schedule or may have significant scope reduction. The most recent bridge inspections, conducted by NDDOT, place both bridges in fair condition and at risk of falling into poor condition within the next three years. As a result, immediate reconstruction is recommended to maintain safe levels of service and operations along 40th Ave. N., given the regional importance of the I-29 and BNSF corridors.

This Project is a priority project for NDDOT, and it has invested approximately $3.3 million to advance preliminary design and environmental documentation for the Project. However, the impacts of inflation have required NDDOT to reassess its upcoming capital program. Securing the BIP funds for this Project will allow NDDOT to reconstruct and maintain the bridges in the most timely and efficient manner possible. In the absence of the BIP award, the schedule and the scope of the Project will be negatively impacted.

IV. MERIT CRITERIA

1. State of Good Repair

Figure 8. 29-69.374 Underside of Deck Girder Rust and Exposed Rebar



There are over 1,700 bridges owned and operated by NDDOT across the state. It is critical to maintain the performance and value of the state's multimodal transportation assets to enable North Dakota to provide a safe and high-level service to its citizens while minimizing the lifecycle costs. The Project meets the goal of the USDOT and NDDOT to improve the condition and safety of existing state-owned transportation infrastructure within the right-of-way, before proposing projects that add new general purpose travel lanes serving single occupancy vehicles. The investment made by the USDOT, NDDOT, and City of Fargo 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.

Operations and Maintenance Costs

The schedule plan for maintaining the Project follows the goals of NDDOT's Transportation Asset Management Plan (TAMP). In the long-term, bridge maintenance costs for the Project are expected to be much less than under the No Build Alternative, as more frequent condition-based preventative maintenance activities would be required to keep the existing bridges in a state of good repair. With the current and projected condition of the bridges, the condition-based preventative maintenance activities will be inefficient.

Table 6. Preventative Maintenance New Bridges

Description	Frequency	Estimated	Lifecycle
Cyclical Preventative Maintenance			
Sweep Decks & Approach Slabs	Yearly (Spring)	2030-2105	$375,000
Wash Decks	Yearly (Spring)	2030-2105	$750,000
Clean Beams, Abutments, & Piers	Yearly (Spring)	2030-2105	$750,000
Crack Seal Bridge Decks	Every 3 Years	2031, 2034, 2037, …	$250,000
Apply Deck Surface Treatment	Every 6 Years	2035, 2041, 2047, …	$400,000
Condition-Based Preventative Maintenance			
Concrete Bridge Decks Overlay	Once at 25 Years	2055	$1,320,000
Bridge Barrier/Railing Repairs	Once at 25 Years	2055	$123,750
Concrete Substructure Repairs	Every 25 Years	2055, 2080	$100,000
Repair Slope Protection	Every 25 Years	2055, 2080	$60,000
Replace Approach Slabs	Once at 50 Years	2080	$660,000
Concrete Bridge Deck	Once at 50 Years	2080	$5,775,000
		TOTAL	**$10,563,750**

The cyclical and condition-based lifecycle (75-years) maintenance activities for the Project are estimated to be $10,563,750. However, without the Project, NDDOT would require an increased frequency of condition-based preventative maintenance activities and additional cyclical preventative maintenance activities to include activities listed in Table 6 and related to the existing structures. For example, the existing structures require maintenance activities related to expansion joints and bridge bearings. The Project replacement structures will be designed as integral bridges, without expansion joints or exposed bearings. Based upon the Benefit-Cost Analysis, NDDOT would spend over $3.9 million more on lifecycle operations and maintenance costs without the Project through year 2049. The Project will reduce lifecycle operations and maintenance costs.

Addressing Current and Projected Vulnerabilities

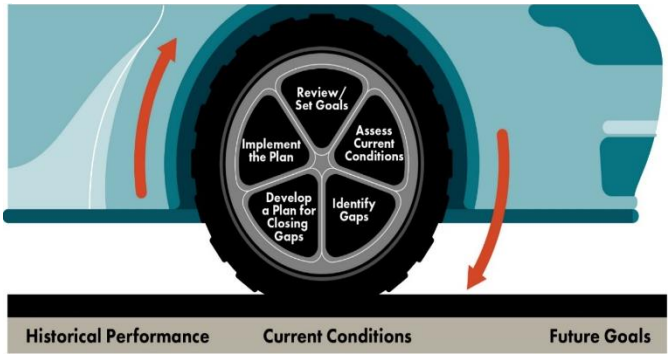
Both bridges 29-69.374 and 29-69.374 N along 40th Ave. N. are showing warning signs of physical deterioration, are functionally obsolete, and have other structural issues needing remediation. Both bridges fell in condition rating between 2021 and 2023 and are currently experiencing identical deficiencies including concrete cracking in the deck and abutments, rusting of the steel girders, approach settlement, and erosion/undermining at the abutments. According to research performed by FHWA's Long-Term Bridge Performance Program (LTBP), bridge 29-69.374 is at risk of falling into poor condition within three-years, by 2027. Bridge 29-69.374 N is at risk of falling into poor condition within four-years, by 2028. However, the LTBP condition forecast is based on 2021 ratings and does not factor in the revised bridge condition ratings, as documented in the 2023 inspection. Given the current and forecast traffic volume over the bridges, NDDOT believes that both bridges are at significant risk of falling into poor condition within three years. Additionally, bridge 29-69.374 N does not meet the current minimum vertical clearance over the BNSF railroad of 23.5-feet and can lead to severe challenges in multimodal freight transportation along the BNSF railroad, which runs between three of the top five agricultural commodity producing counties in the state (2022, by dollar value). Further, the current active transportation facility along 40th Ave. N. fails to meet NDDOT's minimum design standards.

The Reason Foundation ranks North Dakota's highway system as 43rd in the nation for structurally deficient bridges. The BIP funding will allow the NDDOT to proactively address critical bridges 29-69.374 and 29-69.374 N, which are at risk of falling into structural deficiency within the next three years. Overall, North Dakota's highway performance is very strong, ranked in the top ten states in the nation since 2016 and proactively timing improvements to structurally deficient bridges, or those at risk of falling into structural deficiency remains a priority performance improvement area for the NDDOT.

The Project improvements address current and projected vulnerabilities, through full reconstruction of the bridges to a state of good repair, increased vertical clearances and safer sight distances over I-29 and the BNSF railroad, associated modernization and reconfiguration of the 40th Ave. N. interchange with I-29, traffic operations enhancements, and modernization of the bridges and bridge components to a safer standard. Based on traffic forecasts, between 2030 and 2045, the Project will eliminate nearly 8.5-million person miles traveled (PMT) over bridges in fair condition and at risk of falling into poor condition within three years. The Project enhances mobility of goods, services, and intermodal freight and sustains economic growth in Fargo and throughout the region.

NDDOT Transportation Asset Management Plan (TAMP)

Figure 9. NDDOT TAMP Process



The NDDOT has a proven history of fully funding maintenance improvements. Robust transportation asset management is a core and influential principle of decision-making processes to provide a safe and efficient transportation infrastructure throughout the state. The Department developed its first Transportation Asset Management Plan (TAMP) in accordance with the 2012 Moving Ahead for Progress in the 21st Century Act (MAP-21) however, the plan was updated to its current form in November 2022, in compliance with the Bipartisan Infrastructure Law (BIL) and 23 CFR 515. The NDDOT's TAMP expanded beyond the minimum federal regulations to manage all of the Department's pavements and bridges using the asset management principles established in the TAMP.

The NDDOT implements the TAMP through goal-oriented, data-supported methods of managing transportation infrastructure that provides system managers with the information needed to make decisions necessary to reach desired outcomes. The TAMP serves as a guide to analyze life-cycle costs, evaluate risks, develop mitigation strategies, establish asset condition performance measures and targets, and develop investment strategies.

For bridges, NDDOT analyzes a variety of criteria related to condition, safety, and mobility to make decisions about bridge maintenance, preservation, rehabilitation, functional improvement, and replacement. In the past four years the Department has significantly enhanced its inspection data quality by implementing the American Association of State Highway and Transportation Officials (AASHTO) Manual for Bridge Element Inspection. The manual places particular emphasis on protective elements, such as deck wearing surfaces and paint systems, with the goal of protecting the underlying, high-value structural material. The TAMP serves as the guide to ensure all necessary Project operation and maintenance activities are implemented.

2. Safety and Mobility

Figure 10. Bridge 29-69.374 N Approach View Looking West

One of the primary goals of the Project is to improve the safety of all users travelling over and under the bridges through the Exit 69 interchange. In the Project area, 31 of the total 39 crashes (75 percent) between 2014 and 2023 were intersection or intersection related. Of the total crashes, there were 21 rear-end crashes (54 percent) and 15 angle crashes (38 percent), pointing specifically towards operational and geometric issues at the intersections. No severe crashes (fatal and/or serious injury crashes) occurred during this timeframe however, the crash rate in the Project area is expected to rise given the six cross-traffic conflict points, increasing traffic, confusing interchange alignment, and sight distance deficiencies. Sight distance is a major contributing factor for crashes in the Project area, known to increase the likelihood of rear-end crashes on the approaches and angle-crashes within intersections because motorists may not be able to see and react to approaching vehicles over the bridges.

The existing proximity between the bridges at Exit 69 creates confusion for drivers traveling through the I-29 interchange on 40th Ave. N. As measured from bridge deck to bridge deck, structure no. 29-69.374 is 550-feet west of structure no. 29-69.374 N, which leads to safety challenges caused by drivers not knowing which bridge they have just crossed. The confusion of the roadway alignment is exacerbated by vertical curves and steep grades associated with the bridges over I-29 and the BNSF railroad.

Targeting Projected Safety Problems in the Project Area

As one of the region's primary growth areas, the Project area is expected to see an increase in traffic through 2045. Based on traffic forecasts, person miles traveled (PMT) over the existing bridges in the Project area (29-69.374 and 29-69.374 N) was approximately 256,749 PMT in 2023. By 2045, annual PMT over the bridges is estimated to increase to 753,877. Based on the projected growth of PMT, crashes within the Project area are expected to increase from 3.9 crashes a year in 2021 (annual average based on historical data summarized above) to at least 11.2 crashes a year in 2045. The annual crash increase is proportional to PMT growth and does not reflect the anticipated crash rate increase, as traffic growth exacerbates operational challenges associated with the existing bridge alignment, interchange configuration, and sight distance challenges. See also the BCA workbook for more details on crash assumptions.

Targeting Known Safety Problems in the Project Area

Operational Safety Improvements

The Project will replace both bridges to meet minimum vertical clearances. The replacement structures will meet 17-feet minimum vertical clearance for new bridge 29-69.374 (currently 17.4-feet, however cannot be widened while maintaining vertical clearance) over I-29 and 23.5-feet minimum vertical clearance for bridge 29-69.374 N (currently 23-feet) over the BNSF railroad to meet standards of the NDDOT and BNSF, respectively. Addressing the minimum vertical clearances of both bridges will increase safety and resiliency to bridge strikes associated with oversized loads of freight traveling on I-29 and the BNSF railroad.

To accommodate existing sight distance challenges associated with the bridges, increased vertical clearances, and projected future traffic, the Project includes reconfiguration of the Exit 69 interchange, converting the current diamond interchange to a dumbbell (roundabout) interchange. The dumbbell configuration converts each ramp terminal intersection with 40th Ave. N. into a roundabout. Because of the nearest logical tie down points associated with grading the new vertical elevations of the replacement bridges, the 40th Ave. N. intersection with CR 81 will also be converted from a signalized intersection to a roundabout to sustain traffic operations through the Project area and Exit 69 but also to improve the vertical curve and grade associated with tying into the increased 29-69.374 N elevation. Crossing conflict points, or where two opposing vehicle paths cross each other, in the Project area will decrease from 14 to zero. The interchange reconfiguration alone reduces crossing conflict points from the six to zero. Roundabouts are efficient for traffic operations and forecast future volumes by eliminating crossing conflicts, moderating traffic speed, reducing delay and queuing, and improving safety. The anticipated safety benefit at intersections in the Project area include a 33 percent reduction in total crashes, 82 percent reduction in fatal and injury crashes at the I-29 ramp terminal intersections, and 78 percent reduction in fatal and injury crashes at the 40th Ave. N. and CR 81 intersection. The roundabout at the I-29 northbound ramp terminal intersection will eliminate the potential for wrong way turns from westbound 40th Ave. N. onto the exit ramp. The Project also incorporates NDDOT's wrong way detection system, programmed for construction in 2024.

Public feedback received on the Project so far, identifies 40th Ave. N. and CR 81 as popular on-street bicycle routes, and is supported by ridership data shown on Strava's Global Heat Map. As shown in the brighter lines of Figure 5, bicyclists are using the Strava mobile application to track cycling activities and are using both 40th Ave. N. and CR 81 as on-street routes. The Project includes a separated ten-foot shared use path on the north side of 40th Ave. N. The shared use path is accommodated on both bridges and is grade separated from the I-29 ramps. Shared use paths are proven safety countermeasures shown to reduce crashes involving bicyclists and pedestrians up to 89 percent. The shared use path accommodates safer connection to essential jobs and future jobs located in Fargo's primary growth area just east and west of Exit 69.

Structural Safety Improvements

The Project will provide safety improvements associated with modernized bridge structures such as:

- **Edge Drains** – new edge drains will assist with stormwater drainage, increasing bridge sustainability and resiliency, and decrease pooling of water during precipitation or snowmelt events to alleviate wet driving surfaces and ensure safe operating conditions.
- **Raised Median** – raised medians through the Project corridor manage increasing vehicular traffic and eliminate errant or wrong way turning movements to reduce crashes.
- **Bridge Railing** – new bridge railings and guardrails will meet current Manual for Assessing Safety Hardware (MASH) standards.
- **Upgraded Lighting** – upgraded lighting throughout the Project will reduce nighttime injury crashes, and has been proven to do so on rural highways by 28 percent.
- **Upgraded Roadway Striping** – the Project will provide ground in wet reflective multi-component striping. This type of striping reduces crashes by increasing visibility of striping during certain weather-related precipitation events.
- **High Friction Surface Treatment (HFST)** – NDDOT typically provides higher friction coefficients in new pavements which help drivers maintain control of their vehicle and reduce crashes caused by

wet driving conditions and/or steep grades associated with the Project area. According to FHWA, HFST was shown to reduce injury crashes by 63 percent at interchange ramps and total intersection crashes by 20 percent.

- **Piers** – the Project removes the outside piers along I-29 by changing from a four- to a two-span bridge structure. Piers are hazardous immovable objects for travelers along the interstate and are especially dangerous for run off road crashes or other crashes causing the driver to lose control and travel in the direction of a pier. The Project will also implement pier protection in the median of I-29 to not only protect drivers from crashing directly with the pier, but to protect the pier from damage that would occur if a vehicle or truck were to impact the pier at high speed.

Emergency Management and Emergency Services

As shown in Table 7 and Table 8, traffic operations will create life-threatening delay for emergency services, when every second counts. Furthermore, just 800-feet east of the Project area, is the North Dakota National Guard Readiness Center and Army National Guard Armory which are critical statewide emergency management facilities, serving under command of the Governor to respond to natural disasters or other state emergencies. The project sustains mobility of emergency services and emergency management for the state.

3. Economic Competitiveness and Opportunity

The Project replaces two adjacent (within 550-feet) 40th Ave. N. bridges including bridge 29-69.374 over I-29 and bridge 29-69.374 N over the BNSF railroad, improving traffic operations and 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 the following corridors critical to the national, regional, and local economy:

- I-29 as one of the most critical highway segments of the U.S. freight transportation system,
- BNSF Hillsboro Addition railroad which runs between three of the top five agricultural commodity producing counties in the state (2022, by dollar value), and
- 40th Ave. N. as a regional freight corridor in Fargo's most critical industrial growth areas.

The Project reconstructs the bridges to accommodate intersection capacity improvements at the I-29 Exit 69 interchange and brings both bridges to a state of good repair to strengthen the resiliency of critical multimodal transportation infrastructure in North Dakota. Load posting, closing, or worst-case failure scenario related to the condition of the bridges, would have significant consequences to the local and broader economy which depends on I-29, BNSF railroad, and 40th Ave. N. to move goods and services. Additionally, the Project improves traffic operations and supply chain efficiency at the I-29 interchange with 40th Ave. N., reducing vehicle hours traveled (VHT) by over 8.7 million VHT through 2049.

Impacts to I-29

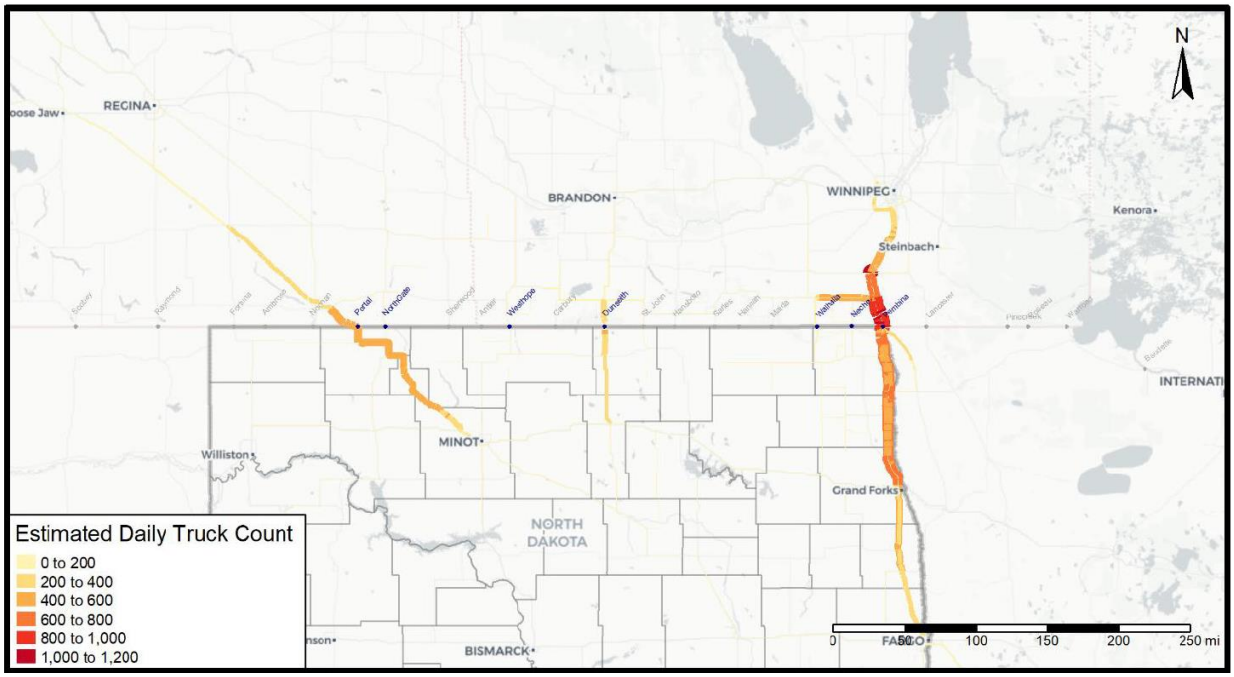
The Project bridges are part of a system of structures associated with the I-29 Exit 69 interchange with 40th Ave. N. As shown in Table 1, traffic on 40th Ave. N. almost quadruples from current levels. As a majority of these trips pass through the interchange intersections, the lack of additional intersection and lane capacity at the interchange intersections quickly results in these intersections failing as left turning traffic on 40th Ave. N. onto the I-29 entrance ramps stops traffic and creates gridlock conditions. Backup queues quickly propagate from the interchange, expanding gridlock throughout the corridor and on the exit ramps from I-29, which affects the right lanes of the mainline. Furthermore, as the forecast condition of both bridges continues to degrade, I-29 also becomes more vulnerable to impacts caused by structural deficiency.

Freight

Truck freight (truck) traffic on I-29 is high compared to total traffic in North Dakota. Truck traffic just north and south of I-29 in the Project area making up as much as 21 percent of Average Daily Traffic (ADT). When comparing 2023 traffic counts to 2021 data, overall traffic and truck traffic has grown. I-29 is a vital freight corridor for the state, the region, and internationally for example, the corridor is a major truck route connecting Canada with local commodity generators within the U.S. Midwest region.

Approximately 150-miles north of the 40th Ave. N. bridges, I-29 reaches the Pembina-Emerson Border Crossing. The Pembina, ND border crossing is the 12th busiest U.S.-Canada border crossing by overall traffic and 6th busiest port of entry by truck counts. Freight movement on I-29 through the Project area is vital to the economy of North Dakota, and the nation. The Federal Highway Administration's (FHWA) Freight Analysis Framework reports that in 2017, the value of freight commodities in North Dakota was $296.2 billion ($397,331 per capita). Around $179 billion (60 percent) was domestic, $75 billion (25 percent) was import, and $43 billion dollars (14 percent) was export. $88 billion (30 percent) was associated with Other Estimated Through flows, which largely represent higher-value goods moving by long-haul truck and rail between the Pacific Northwest and the Midwest. The next highest value of $83 billion (28 percent) was for International Gateway trade between Canada and other US states.

Figure 11. Border Crossing Top Truck Route Analysis (NDDOT)



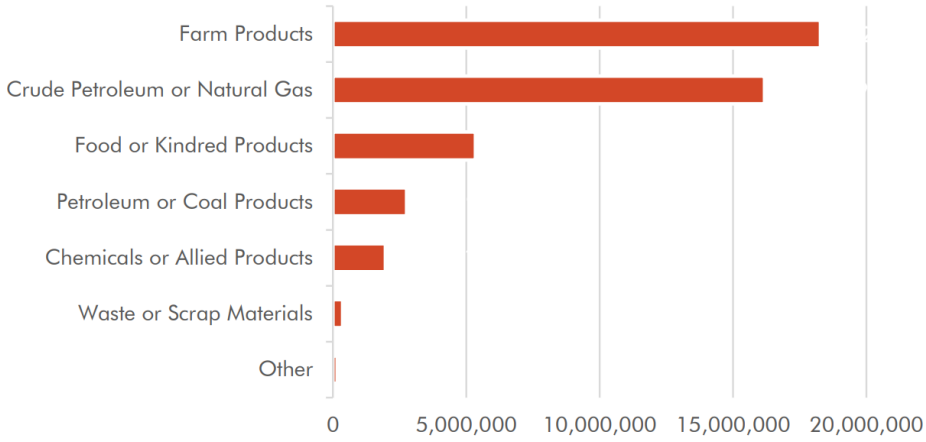
Impacts to BNSF Railroad

Just 500-feet from bridge 29-69.374 is bridge 29-69.374 N which carries 40th Ave. N. over the BNSF Hillsboro Subdivision railroad. BNSF operates the most rail miles in the state with a network of 1,632 miles. The Hillsboro Subdivision is just a small part of the BNSF rail network that provides access to the American West, Gulf of Mexico, and to Canada providing an international gateway for North Dakota's exports and imports. The Hillsboro Subdivision provides connection to Canada and the 5th busiest U.S.-Canada port of entry by rail. On average, ten trains per day travel under bridge 29-69.374 N, including two passenger trains.

Regionally, the BNSF Hillsboro Subdivision is a critical line of rail for North Dakota, connecting three of the top five agricultural commodity producing counties in the state (2022, by dollar value), including Cass County (first), Grand Forks County (fifth), and Walsh County (fourth). Farm products are the largest

commodity type shipped by freight in the state and include primarily corn, soybean, and wheat shipments. Soybeans, wheat, and corn made up 54 percent of the value of North Dakota's farm exports in 2022.

Figure 12. North Dakota Freight Rail Outbound Tonnage by Commodity (2019)



Impacts to 40th Avenue North

The Fargo, ND-MN Metropolitan Statistical Area produced 34.3 percent of North Dakota's total GDP in 2022. The 40th Ave. N. corridor and most of the quadrants (excluding southwest, NDSU agricultural research plots) of land around I-29 Exit 69, is Fargo's primary industrial growth area forecast to see an increase in new jobs and households through year 2050. However, the northeast quadrant of the interchange and just east of I-29 have seen recent and existing developments that directly impact the supply chain and local economy:

- Amazon Fulfillment Center
- Marvin Windows
- Sky Logistics
- IAA Fargo
- Prinsco, Inc
- CHS Sunflower
- Digi-Key Electronics
- Reile's Transfer & Delivery
- Precision Equipment MFG
- Royal Logistics
- Border States Paving
- The RiteScreen Company
- United Parcel Service (UPS) Fargo Airport Gateway
- Bemidji Aviation Services Inc
- Federal Express (FedEx)

Recent major industrial and logistics, intermodal air cargo, and emergency management projects have accelerated growth in supply chain related sectors around the Exit 69 interchange and 40th Ave. N. The Project corridor is an important regional intermodal freight corridor, linking I-29 and air cargo operations at Hector International Airport. In 2023, the airport landed 6,046 aircraft with a total weight of 406,090,395 pounds.

Applicant Considerations to Support Economic Competitiveness and Opportunity

The NDDOT has proactively developed a strong portfolio of many programs that provide economic opportunity to contractors and their employees, including On-the-Job Training (OJT) Program, Disadvantaged Business Enterprise (DBE) Program, Equal Employment Opportunity (EEO) Program, among others.

The Department also complies with all other federal regulations including Title VI/Nondiscrimination & ADA, Davis-Bacon, Title VII/Internal Equal Employment (EEO). Under the Contractor Compliance Review Program (CCR), routine and randomized audits of contractors where federal funds were utilized, ensures compliance with all federal and state regulations/programs.

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

Greenhouse Gas Emissions

Without the Project, traffic over the bridges will face more and more operational challenges resulting in increased delays. The forecast traffic increase through 2045 is significant, with a major increase in vehicles and heavy commercial vehicles crossing over the bridges and through the I-29 interchange on 40th Ave. N. As shown in Table 7 and Table 8, the 2045 traffic increases through the Project area will result in significantly more traffic delay under existing conditions. The additional delay will result in 8.7 million additional vehicle hours traveled (VHT) through 2049. The Project will decrease VHT by improving traffic operations and decreasing delay, resulting in a reduction of greenhouse gas emissions by nearly 1,800 metric tons.

Table 7. 2045 Interchange and Approach Level of Service: 40th Avenue North and I-29 Southbound Ramps

Interchange	Approach	AM Peak			PM Peak		
		Vehicles	LOS	Delay	Vehicles	LOS	Delay
Existing	SB Ramp	111	D	39.9	191	C	21.3
	EB 40th Ave	910	B	14.0	449	C	26.9
	WB 40th Ave	674	B	10.0	1,429	A	3.3
	Total	**1,695**	**B**	**14.1**	**2,068**	**B**	**10.1**
Dumbbell (Roundabouts)	SB Ramp	113	A	5.8	190	C	23.1
	EB 40th Ave	1,010	A	2.6	504	A	4.7
	WB 40th Ave	682	A	0.6	1,436	A	0.7
	Total	**1,805**	**A**	**1.9**	**2,130**	**A**	**3.4**

Table 8. 2045 Interchange and Approach Level of Service: 40th Avenue North and I-29 Northbound Ramps

Interchange	Approach	AM Peak			PM Peak		
		Vehicles	LOS	Delay	Vehicles	LOS	Delay
Existing	NB Ramp	681	B	14.4	997	B	16.1
	EB 40th Ave	468	A	6.6	323	C	32.6
	WB 40th Ave	570	B	17.2	1,029	C	21.5
	Total	**1,720**	**B**	**13.2**	**2,348**	**C**	**20.8**
Dumbbell (Roundabouts)	NB Ramp	686	A	3.6	999	A	3.4
	EB 40th Ave	510	A	0.7	348	A	0.7
	WB 40th Ave	578	A	2.7	1,037	B	10.2
	Total	**1,053**	**A**	**4.4**	**1,213**	**A**	**5.5**

Project Delivery Components

Environmental Justice Analysis

As part of the Documented Categorical Exclusion (DCE) process and in compliance with Executive Order (E.O.) 12898, the Project will undergo an Environmental Justice Analysis pursuant to NDDOT's Environmental Justice Analysis Guidance. The guidance recommends the U.S. Environmental Protection Agency's (EPA) EJSCREEN to identify low-income and/or minority populations within 0.25-mile buffer (minimum) of the Project. If readily identifiable populations of low-income and/or minority populations are identified in the Project area, a determination of adverse impact will be made. Depending upon the determination of adverse impact under the NDDOT National Environmental Policy Act (NEPA) process, and whether the adverse impact is disproportionate to low-income and/or minority populations, avoidance, minimization, or mitigation measures will be taken in compliance with NDDOT's Design Manual, Chapter II, Section 3, which provides guidelines to involve all impacted populations in the decision-making process.

According to the EJSCREEN Community Report, 805 people live within one-mile of the Project. The minority population makes up 13 percent and low-income population makes up 4 percent of the total population. In proximity to the Project, neither concentration of minority and low-income population is higher than that of Cass County or City of Fargo and does not meet the established thresholds of a readily identifiable low-income and/or minority population. Given the scope of the Project and proximity to vulnerable populations, the proposed improvements are not anticipated to have a disproportionately adverse impact on low-income and/or minority populations.

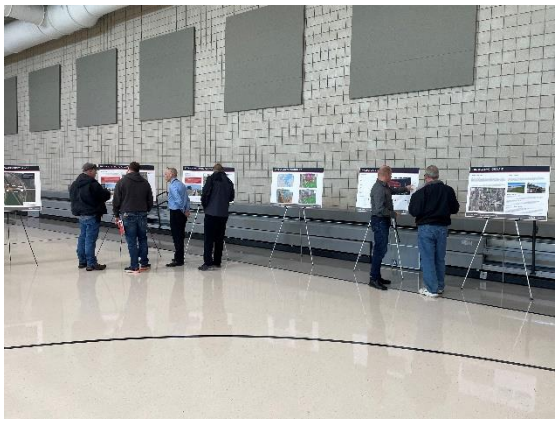
Avoiding Floodplain and Wetland Impacts

The Project area is in the Red River Valley approximately 2.8-miles west of the river. Part of the Project area is in a Federal Emergency Management Agency (FEMA) flood hazard zone. The majority of the Project area west of I-29 is flood protected by a levee and has a reduced flood risk. Most of the existing roadway system is raised and within the 500-year floodplain (0.2 percent annual chance of flood hazard zone) or areas with reduced risk due to a levee. NDDOT will coordinate with the local floodplain administrator of the zoning authority to achieve compliance with E.O. 11988, *Floodplain Management*, and local regulations including the Cass County Flood Damage Prevention Ordinance and the City of Fargo Flood Plain Management Ordinance (Article 21-06). The Project is anticipated to have little impact outside of the existing Project area and the final design will not contribute to flooding and will minimize any potential impacts to the floodplain. The U.S. Fish & Wildlife Service's (USFWS) Information for Planning and Consultation (IPaC) resource list found that the Project area did not intersect any wetlands mapped by the National Wetlands Inventory (NWI).

5. Equity and Quality of Life

Meaningful Public Engagement in an Area of Persistent Poverty

Figure 13. Public Input Meeting #1



As Project planning activities have progressed, NDDOT has utilized the Department's robust Public Involvement & Coordination process to effectively engage community members within an Area of Persistent Poverty (APP). To date, NDDOT has conducted targeted outreach, recorded and responded to community input, established appropriate community expectations, and provided clear and consistent communication with identified stakeholders. The outreach format has included hosting a project website at www.dot.nd.gov/exit69, two public input meetings, targeted focus groups, in-person/hybrid/virtual events, surveys, direct mailing/emailing, social media, newspaper, and other advertisements etc. The information provided at each event generally included project information, improvements and impacts, updates, schedule, opportunities for comment and feedback, and links for in-person and virtual participation options. As Project development progresses, NDDOT has prepared a Public Engagement Plan that will continue to guide meaningful public involvement for people from all walks of life.

Incorporation of Bicycle and Pedestrian Facilities

The Project incorporates a separated ten-foot shared use path on the north side of both bridges (29-69.374 and 29-69.374 N) on 40th Ave. N. The shared use path is also grade separated under the I-29 ramps. Bicycle and pedestrian facilities are critical through the Project corridor and across I-29, as growth and job creation continue. In 2021, Fortune 500 company Amazon opened its first distribution facility in North Dakota, less than half a mile northeast of the Project area. The Amazon Fulfillment Center is associated with at least 500

full-time jobs however, Cass County's unemployment rate has historically been low, just 2.1 percent by current U.S. Census Bureau five-year estimates. The separated shared use path provides critical labor force accessibility to existing and future jobs for people walking and/or biking to work. Research from the University of Minnesota finds that investments in biking routes continues to produce benefits in U.S. metros including job accessibility. The Project will increase affordable transportation choices and eliminate barriers for people who want or need to bike or walk to access a good-paying job. Studies have also shown that adding protected bicycle lanes increases ridership, which reduces vehicle dependence, resulting in more physical activity, better health, and greater quality of life.

Access to Jobs

By sustaining traffic operations and improving bridge conditions to avoid potential load posting and closure, the Project provides multimodal access to existing and future good paying jobs in the Project area. The 2050 Baseline Demographic Forecast, completed in 2022, identified existing and future socio-economic conditions throughout region. The study estimates jobs and households in specific Traffic Analysis Zone (TAZ) geographies. The Project is in proximity to the following TAZ geographies at the I-29 Exit 69 interchange:

- TAZ 188 (northwest quadrant)
- TAZ 46 (southwest quadrant)
- TAZ 728 (northeast quadrant)
- TAZ 43 (northeast quadrant)
- TAZ 216 (southeast quadrant)
- TAZ 41 (southeast quadrant)

Metro COG estimates the following socioeconomic factors in the Project area:

Table 9. Socio-Economic Forecast 2050

TAZ	2021 (baseline)		2035 forecast		2050 forecast	
	Jobs*	HHs	Jobs	HHs	Jobs	HHs
188	52	0	70	1	287	12
46	0	0	129	0	258	0
728	80	2	269	2	834	0
43	176	0	351	0	876	0
216	0	3	0	3	0	3
41	27	7	214	8	400	8
Total change from baseline			**+698**	**+2**	**+2,320**	**+11**
Total percent change			**+208%**	**+17%**	**+693%**	**+91%**

*Baseline data does not reflect recent developments in the Project area and is considered a conservatively low estimate.

Nearly 700 additional jobs are expected to be in proximity to the Project by 2035, and 2,320 additional jobs by 2050. The Project sustains 40th Ave. N. as a critical connector to jobs by improving traffic operations and decreasing delay, and providing a separated shared use path facility for those who want or need mobility through transportation alternatives.

6. Innovation

The Project incorporates innovative practices in both the design of the structures as well as the contracting of services to facilitate the expediated delivery of project benefits while maximizing cost savings. The use of innovative and environmentally conscious technologies, as well as the incorporation of these design features and practices will meet and exceed the criteria provided by USDOT for innovation in BIP projects.

Innovative Design

The Project design includes integral bridges, with seamlessly connected abutments which eliminates the need for expansion joints and exposed bearings. Integration of the abutments uses advanced precision-engineering in bridge design and production to reduce lifecycle maintenance cost, improve safety, and deliver a longer service life.

Innovative Delivery

The Project utilizes bundling of the two bridges into a single contract for pre-construction activities as well as for construction. The proximity (550-feet from bridge deck to bridge deck) and systemic function of the bridges makes it imperative to execute the contracts as a single project, thereby, leading to cost and time savings, compared to executing two separate bridge projects on 40th Ave. N. Replacing the bridges as part of the overall functional system of the I-29 Exit 69 interchange, makes project bundling the logical strategy in pursuit of Project procurement and implementation.

Innovative Financing

In 2023, the 68th North Dakota Legislative Assembly passed Senate Bill 2113, which created the Flexible Transportation Fund. House Bill 1012, passed in the same session, appropriated funds for the Flexible Transportation Fund to provide local match for federal funding obtained by the NDDOT, and for construction and maintenance costs for state-funded road and bridge projects both on and off the state highway system. The creation of the Flexible Transportation Fund built on the success of House Bill 1015 which was passed the 67th legislative session in 2021 and provided state appropriations for matching discretionary federal grants – the first time that the NDDOT received an appropriation from the state's general fund for the sole purpose of matching federal discretionary grants. Senate Bill 2113 and House Bill 1012 are a further continuation of innovative transportation financing pursuits for North Dakota. The Project will include innovative funding mechanisms associated with the State's flexible transportation fund.

V. 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.

No Build Alternative

The No Build Alternative assumed that no reconstruction or major rehabilitation work would be undertaken on any of the 40th Ave. N. bridges and associated I-29 Exit 69 system. The Project area intersections including the roadway over the bridges were expected to experience more and more delay as traffic continues to grow and traffic operations are challenged. The remainder of the transportation network assumed no changes relative to its existing layout.

Build Alternative

The Build Alternative included the reconstruction 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 2024 through 2026
- 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 $43.7 million. The current 2022 project costs discounted at a rate of 3.1 percent is approximately $35.9 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. Results of the benefit-cost analysis are shown in Table 10, with detailed documentation presented in the technical memorandum and workbook.

Table 10. 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	$35.9 million	$124.8 million	3.5	$88.9 million

Additionally, the Project benefits under various categories results in the cost benefits/savings listed in Table 11.

Table 11. Project Benefits

Benefit Category	Benefit (2022 Dollars)
Air Quality: CO2 (2%)	$376,438
Air Quality Sans CO2	$476,583
Safety Savings	$1,431,702
Travel Time Savings	$114,284,111
Operations and Maintenance	$3,964,344
Remaining Capital Value	$4,279,565
Total Benefits	$124,812,742

VI. PROJECT READINESS & ENVIRONMENTAL RISK

Technical Feasibility and Technical Competency

The Project is well positioned to begin construction on schedule in 2028. Project cost estimations are stable, preliminary engineering has been underway since 2022, and the environmental document is being finalized. Preliminary engineering and NEPA clearance are anticipated to be completed in May 2024.

The following reports and documents have been prepared for the Project thus far, through preliminary engineering:

- Traffic Operations Analysis Report (April 2023)
- Recommended NEPA Document Decision (June 2023)
- Interchange Selection and Decision Report (August 2023)
- Decision Document (August 2023)

Design criteria are established through the NDDOT's standards. The technical challenges are well documented and understood, as the Department has completed similar projects throughout the state. Based upon NDDOT's experience with similar projects, a contingency rate of 20-percent has been established to account for remaining unknowns. The NDDOT is prepared to handle cost overruns if they should occur, through the Flexible Transportation Fund. The Department 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. Since recordkeeping began in 2003, the NDDOT has always received the additional federal highway funds redistributed in August to grant recipients that met all obligation deadlines for that year.

Project Schedule

The Project schedule identifying the completion of major milestones is presented below (Figure 14). All planning agreements, permitting, review periods, and approvals have been considered. The NDDOT will be prepared for construction to begin in Summer 2028 and will be completed in Fall 2029. The Project requires one acre of additional permanent right-of-way and acquisition will be pursuant to the Uniform Act and the NDDOT acquisition procedures. There are minimal project risks associated with the Project as indicated by project readiness.

Figure 14. Project Schedule Placeholder

*Project can be let earlier if funding is fully secured.
**Project end date March 2032.
*** *All dates assume the grant agreement is in place prior to the project's Construction Obligation Deadline.

Required Approvals

Environmental Permits & Reviews

The NDDOT is well underway with the NEPA process for the Project. The Documented Categorical Exclusion (DCE) is being prepared, with NEPA review and approval through the Department's Determination and Approval for Categorical Exclusion process expected in November 2024. As identified

through preliminary engineering and the DCE development process to date, status of required permits and approvals are provided in Table 12 below.

Table 12. Required Permits & Approvals

Permits/Approvals	Agency	Action Required (Status)
Section 404	U.S. Army Corps of Engineers	To be acquired.
NDPDES	ND Dept. of Environmental Quality	To be acquired.
Floodplain Permit	Reed Township	To be acquired.
Floodplain Permit	City of Fargo	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 State's Long Range Transportation Plan (LRTP) and core family of plans including the Freight & Rail Plan, Statewide Active and Public Transportation Plan, and Transportation Asset Management Plan (TAMP). The Project is currently programmed in NDDOT's 2024-2027 Statewide Transportation Improvement Program (STIP) by reference. The Project is in the MPA of Fargo and some funding for the Project is programmed in the 2024-2027 Transportation Improvement Program (TIP) for fiscal year 2027. The Project will remain programmed in the STIP and Metro COG TIP through obligation (i.e., 2025-2028 STIP/TIP).

Federal Transportation Requirements Affecting State and Local Planning

As summarized above, the Project is consistent with current NDDOT plans as programmed in the STIP and Metro COG TIP however, as referenced in Section III, the current funding programmed for the Project in the STIP and TIP is not the full amount required to deliver the Project. Through obligation of BIP funds, the Project will continue to be programmed into the STIP and TIP as applicable. Revisions associated with completed final design and/or BIP award will be reflected in both documents pursuant to 23 CFR § 450.328.

Assessment of Project Risks and Mitigation Strategies

The NDDOT understands potential uncertainties and risks associated with completing Project design, environmental clearance, and construction management. The Department has decades of experience completing environmental, planning, design, and constructing bridge replacement and interchange projects. This robust experience aids in mitigating situations that may impact the Project schedule. During the project development stage, NDDOT will conduct frequent meetings to identify risks and mitigation strategies as the Project progresses. When the Department is unable to complete items in-house, there is flexibility to hire consultants to be an extension of the team, as well as redirect staff to ensure that work is completed on schedule. The NDDOT has standard construction specifications vetted by the FHWA – North Dakota Division's office to address construction delays based on the specific cause of the delay. There may be some utility impacts by the Project, the extent of which will be determined by NDDOT as Project design progresses. Right-of-way acquisition must also take place and will commence as soon as the DCE is finalized and is being funded through NDDOT non-federal funding sources.

VII. ADMINISTRATION PRIORITIES AND DEPARTMENTAL STRATEGIC PLAN GOALS

The Project will advance 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 regional multimodal transportation system safer for people and freight by targeting projected safety problems, targeting existing safety problems, and sustaining critical mobility for emergency services and emergency management. The Project eliminates 14 existing cross traffic conflict points on 40th Ave. N. and addresses critical sight distance challenges associated with the bridges at the I-29 ramp terminal intersections by converting existing intersections to roundabouts. Operational improvements at intersections proactively improve safety as traffic continues to grow, forecast to nearly quadruple by 2045. Including operational improvements, the Project also incorporates safety improvements in nearly every aspect of the design, including: separated shared use path, edge drains, raised median, bridge railings, upgraded lighting, upgraded roadway striping, high friction surface treatment, and piers.

Climate Change and Sustainability

The Project reduces emissions and improves resilience of the multimodal transportation system. Section VI Subsection 4 identifies greenhouse gas emissions reductions in the transportation sector resulting from intersection and roadway capacity improvements. Approximately 1,800 metric tons of greenhouse gases will be reduced through the Project's operational improvements to decrease vehicle delay.

The NDDOT has developed the Project thus far 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 is located within an Area of Persistent Poverty (APP) and will include an Environmental Justice Analysis to reduce inequities across the multimodal transportation system, and surrounding communities impacted by the Project. The Project has already started the Public Involvement & Coordination process to effectively engage community members within the APP and will continue to include people from all walks of life in the Project's development process.

The Project's safety improvements and new separated shared use path provide multimodal access to existing and future good-paying jobs in the Project area. Nearly 700 additional jobs are expected to be in proximity to the Project by 2035, and 2,320 additional jobs by 2050. The Project sustains 40th Ave. N. as a critical connector to jobs by improving traffic operations and decreasing traffic delay, bringing the bridges into a state of good repair with minimal risk of load posting and closure, and providing a separated shared use path facility for people who want or need transportation alternatives to access good-paying jobs and improve quality of life.

Given the potential impacts, the Project will be subject to a DCE environmental review process, identified for projects that meet or exceed certain thresholds established cooperatively between the FHWA and NDDOT. The Project will not have disproportional or adverse impacts to populations in the Project area.

Workforce Development, Job Quality, and Wealth Creation

As detailed in Section IV Subsection 3, the NDDOT will follow the Department's On-the-Job Training (OJT) Program which provides economic opportunity to contractors and contracted employees. All highway construction contractors are required to participate in the on-the-job training program that focuses on providing skills to minority, female, or economically disadvantaged individuals.

Under the NDDOT's Disadvantaged Business Enterprise (DBE) Program, select contracts are assigned percentage goals, based on the total dollar amount of the contract, for participation by certified DBE firms. The Department produces a monthly newsletter with relevant information on the program and upcoming trainings. The NDDOT also complies with all other federal regulations including Title VI/Nondiscrimination & ADA, Davis-Bacon, Title VII/Internal Equal Employment (EEO). Under the Contractor Compliance Review Program (CCR), the Department performs routine and randomized audits of contractors where federal funds were utilized to ensure compliance with all federal and state regulations/programs.

VIII. DOT PRIORITY SELECTION CONSIDERATIONS

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

(A) As summarized in Section I and Section IV Subsection 1, the Project replaces a bundle of two bridges, both of which are in fair condition and, according to FHWA's LTBP condition forecast tool and 2023 bridge inspection reports, are at risk of falling into poor condition within three years.

(B) The local share of the Project is funded through NDDOT's Flexible Transportation Fund, City of Fargo special assessments and sales tax revenues, and Cass County Road and Bridge Fund. As described in Section VI, the programmed STIP/TIP funding is insufficient to deliver the Project. Therefore, without a BIP grant NDDOT and City of Fargo will be unable to complete the Project.

The Project also meets the following characteristics:

2) The Project will be ready to proceed to the next stage of project delivery (final design) within 12 months of a DCE Determination, as outlined in Section VI.
3) The Project includes accommodation for bicycles and pedestrians by constructing a separated ten-foot shared use path across the bridges along the north side of 40th Ave. N., grade separated from I-29 ramps, and at a reasonable cost.
4) The contract to design and construct the Project will be in accordance with NDDOT's OJT Program and DBE Program which provide robust economic opportunity to people from all walks of life above and beyond compliance with Federal law.
5) 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 funding fiscal year plus three years. As a result, immediate reconstruction is recommended to maintain safe levels of service and operations along I-29, BNSF railroad, and 40th Ave. N.

IX. 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/nddot_i29_exit69_bip/