PWF Road Safety & Rehabilitation Improvements

Jefferson County, Nebraska

Jefferson County Contacts

Mark Schoenrock
Chairman
Jefferson County Board of Commissioners
303-909-4291
jeffco1@jeffconebraska.us

Tim Farmer
County Engineer
Speece-Lewis Engineers
402-326-1295
tfarmer@speecelewis.com

Application materials also available on the project website.

FY2022 MULTIMODAL PROJECT DISCRETIONARY GRANT APPLICATION

PROJECT TITLE: PWF Road Safety & Rehabilitation Improvements

Basic Project Information	
What is the Project Name?	PWF Road Safety & Rehabilitation Improvements
Who is the Project Sponsor?	Jefferson County, Nebraska
Was an application for USDOT discretionary grant funding for this project submitted previously?	No
Projects will be evaluated for eligibility for all three programs, unless the applicant opts-out of being evaluated for one or more of the grant programs:	X Opt-out of Mega? X Opt-out of INFRA? __ Opt-out of Rural?

Project Costs	
MPDG Request Amount:	$ 10,124,000
Estimated Other Federal funding:	$ 0
Other Federal funding from Federal Formula dollars:	$ 0
Other Federal funding being requested from other USDOT grant opportunities?	$ 0
From What Program(s)?:	Not applicable
Estimated non-Federal funding:	$ 2,531,000
Future Eligible Project Cost:	$ 12,655,000
Previously incurred costs:	$ 167,975
Total Project Cost:	$ 12,822,975
Amount of Future Eligible Costs by Project Type (Rural): A project on a publicly owned highway or bridge that provides or increases access to an agricultural, commercial, energy, or intermodal facility that supports the economy of a rural area:	$ 12,822,975

Project Location	
State(s) in which project is located:	Nebraska
Urbanized Area in which project is located	Not applicable
Population of Urbanized Area	Not applicable
Is the project located in an Area of Persistent Poverty or a Historically Disadvantaged Community?	No
Is the project located in Federal or USDOT designated areas?	No
Is the project currently programmed in a TIP, STIP, MPO Long Range Transportation Plan, State Long Range Transportation Plan, or State Freight Plan?	Not applicable

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Jefferson County Commissioners

Michael T Dux 402-300-0257 Gale A Pohlmann, 402-656-3733 Mark A Schoenrock, Chairman 402-793-5585

411 4th Street
Fairbury, NE 68352

May 6, 2022

Jefferson County Board of Commissioners
411 4th Street
Fairbury, Nebraska 68352

RE: Support of Jefferson County's PWF Road Safety & Rehabilitation Improvement Project.

Dear Secretary Buttigieg,

This letter is to state the Jefferson County Nebraska board of commissioners' support for the Jefferson County Multimodal Project Discretionary Grant program (RURAL) to complete the PWF (Pawnee City-Wymore-Fairbury) Road Safety & Rehabilitation Improvements. We greatly appreciate the United States Department of Transportation's consideration of the requested investment in this project as it is a critical infrastructure asset for our community.

As identified in our application packet, the project will target known, documented safety problems and will greatly expand trafficability in rural southeast Nebraska. It will address known health and safety risks, particularly among our young and elderly drivers, and our medical emergency transportation systems. The project will vastly contribute to a state of good repair by restoring and modernizing a core infrastructure asset in our county and for southeast Nebraska.

Consistent with the goals of the Multimodal Project Discretionary Grant program, the project will have a vast positive economic impact on this region of southeast Nebraska, improving mobility of people and business, freight and agricultural products movement, job creation, reducing the cost of doing business and improving local and regional freight connectivity to the national and global economy, decreasing transportation costs, and significantly improving the economic strength of southeast Nebraska. It will remove barriers to opportunity, improve quality of life in this rural area and will significantly engage nearby communities.

The PWF Road Safety & Rehabilitation Improvements is a necessary and worthwhile investment which will have a profound effect on the future viability of our rural community. We fully support and are committed to bring this project to fruition by any required county assets and support.

Sincerely,

Mark Schoenrock, Chairman

Gale Pohlmann, Vice Chairman

Michael Dux, Commissioner

PROJECT DESCRIPTION

Jefferson County is requesting $10,124,000 from the FY 2022 Multimodal Project Discretionary Grant Program (MPDG) under the Rural Surface Transportation Grant to complete the reconstruction of a seven-mile segment of Pawnee City, Wymore, Fairbury (PWF) Road in Jefferson County, Nebraska. The *PWF Road Safety & Rehabilitation Improvements Project* (the Project) is a nearly shovel-ready project that aims to increase safety for the traveling public, strengthen the resiliency of the transportation network, improve the state of good repair, increase local community and agriculture access, and enhance commerce in rural southeast Nebraska. The Project is supported by Senators Fischer and Sasse, Governor Ricketts, Congressman Adrian Smith, Nebraska Department of Transportation (NDOT) Director John Selmer, Diller-Odell Public School Superintendent Mike Meyerle, and numerous local residents, business owners, and farmers.

PROJECT OVERVIEW

In this Project, PWF Road will undergo pavement removal, roadway grading, culvert removal and placement, box culvert construction, concrete paving, erosion control, seeding, bridge deck removal, bridge deck construction, and constructing a new an 80-foot concrete girder bridge. In the interest of sustainability, the base of the original road will be recycled and reused. The Project design takes measures to lessen its impacts by minimizing roadway vertical curves, minimizing lengths to meet roadway lateral clear standards, remaining on existing alignment and right of way, and using culverts that meet design standards. The improved paved roadway will greatly increase operational efficiency of PWF Road, improving community connections and quality of life by reducing travel times along the roadway and eliminating lengthy detours to access businesses and services that avoid the existing poor-quality roadway.

EXISTING TRANSPORTATION CHALLENGES

Today, the seven-mile section of PWF Road encompassed by the Project is made of asphalt, is full of potholes, and lacks guard rails. In the last 30 years, despite annual maintenance activities, PWF Road has fallen into a state of disrepair so great that it is unsafe for residents, employees, emergency first responders, and travelers. In poor weather, these conditions worsen and present an even greater safety risk. PWF Road is made of 30+ year old asphalt that varies in depth between five to 10 inches, much of which is patched with cement. It has severe subgrade issues in numerous areas that can only be addressed through full-depth repair. Between 581st Avenue and 582nd Avenue, PWF Road crosses a structurally deficient 50-foot steel girder 87-year-old bridge with a concrete deck that needs replacement. Each day, between 255 and 354 vehicles depending on the segment use the portions of PWF Road affected by this Project.[1]

As shown in the Project map in Figure 1, even though PWF Road is a shorter and more convenient route for individuals traveling between eastern Jefferson County and Fairbury,

[1] U.S. DOT (2021). Highway Performance Monitoring System. Functional System 5. Updated October 18, 2021. https://data-usdot.opendata.arcgis.com/datasets/usdot::highway-performance-monitoring-system-fsys-5/explore?location=40.127784%2C-96.933539%2C14.92.

many individuals choose to travel on Highway 8, Highway 136, and Highway 103 because of the poor condition of PWF Road. Many individuals take their business outside of Jefferson County to towns in neighboring counties, such as Beatrice and Wymore, to avoid PWF Road. This is particularly likely for individuals who reside or work in the area between Highway 136 and Highway 8, including the Village of Diller. Glenn Behrends, Village of Diller Chairman, noted in his letter of support that the safety risks posed by PWF Road encourage individuals to take alternate routes and participate in the economies of neighboring counties.

In addition to residents and business owners diverting their travels from PWF Road, emergency medical service (EMS) providers also avoid traveling on this route as the poor road conditions make it challenging to comfortably treat patients in the back of EMS vehicles. However, diverting to a highway can add up to ten minutes of travel time. This EMS detour is especially costly when minutes can be the difference between life or death for a patient in a life-threatening condition.

> *"People are refusing to drive on PWF Road to Fairbury because it is too rough and dangerous. The poor condition of the road is forcing community members to drive to Beatrice for necessities, groceries, parts, etc. Business and residents are forced to take alternate routes to avoid traveling on PWF Road. This results in a loss of fuel and time, in addition to a loss of tax revenue for Jefferson County."*
>
> *– Glenn Behrends, Chairman, Village of Diller*

Still, many individuals have no choice but to use PWF Road, thereby undertaking a safety risk. Kevin Sasse, resident and farmer, reports that "the deterioration is so significant [that] it is not safe to meet another vehicle in some areas. There are portions where it can throw a vehicle into the ditch or on-coming lane due to repetitive holes and crumbling road surface." This disrepair impacts the mobility for residents and businesses alike. Many of Jefferson County's schools are in downtown Fairbury and as such, many school busses and high school-aged students drive on PWF Road each day. Additionally, PWF Road sees the transport of millions of dollars of corn, grain, and freight annually, as it is the primary transportation pathway from local grain bin sites to the Farmers Cooperative in Jansen.

HOW THIS PROJECT WILL ADDRESS EXISTING TRANSPORTATION CHALLENGES

Completing the reconstruction of PWF Road will create a safe, resilient, and efficient route for residents, businesses, and travelers in the region. In a letter of support, Beth Roelfs, Member of the Diller Community Foundation Fund and Board Member of the Nebraska Community Foundation, highlighted the importance of safe, quality roadways in ensuring regional workforce mobility and economic development, saying that "the development and maintenance of infrastructure is imperative to youth recruitment and future growth. It is the collaboration of local and state agencies that will help rural and urban Nebraska maintain strong and vibrant places for our young people to live their dreams."

PROJECT HISTORY

PWF Road safety and rehabilitation improvement plans, including design and engineering, were completed in 2016. The plans separated the improvements into three segments. In 2016,

Jefferson County reconstructed segment 1, a 6.5-mile section of PWF Road with a concrete surface from the west end of PWF Road to the intersection of PWF Road and 575th Avenue. Segment 1 construction cost $7.55 million and was paid for by Jefferson County. In October 2014, prior to bond issuance, three public meetings were held at community centers in Fairbury and Diller. Segment 2 runs from 575th to 581st Avenue, and segment 3 starts at 581st Avenue and ends at the Jefferson County line with Gage County. Currently, Jefferson County spends over $100,000 on annual maintenance repairs along the seven miles of the dilapidated PWF Road that make up segment 2 and segment 3 of the Project. The Project includes the reconstruction of the seven miles of PWF Road in Jefferson County encompassing segments 2 and 3.

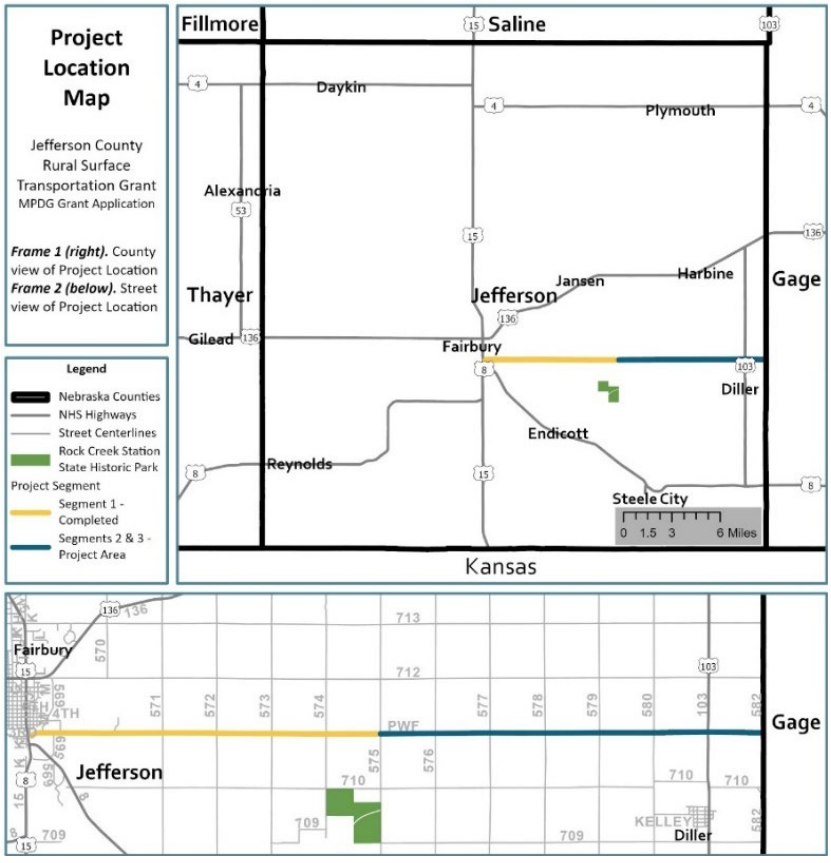
OTHER TRANSPORTATION INVESTMENTS

There are currently no other transportation investments in the Project area.

PROJECT LOCATION

The Project is located on PWF Road, which is 13.5 miles long and connects Pawnee City, Wymore, and Fairbury. PWF Road is a flat, passing-permitted, two-way roadway without guard rails where much of the roadway is flanked by corn fields, grain fields, and cattle ranches. The Project location is a seven-mile segment of PWF Road between 575th Street and 582nd Street, including a 50-foot bridge between 581st Street and 582nd Street (Figure 1 and Appendix A).

Figure 1: Project Location Map



The Project is not located in an Area of Persistent Poverty (APP), a Historically Disadvantaged Community, a Census-designated Urbanized Area, or a Federally designated community development zone. However, Census Tract 9638, which is directly adjacent to the western end of PWF Road (next to segment 1), is an area of persistent poverty (as shown in Appendix A).

PWF Road is the only paved east-west road in this part of the county because all other parallel east-west roads (e.g., 709th – 713th Road) north of Highway 8 and south of Highway 136 are gravel roads. Additionally, there are no north-south roads that intersect the Project area (576th – 582nd Street) that are paved. Figure 2 shows a typical gravel road intersection with PWF Road.

Figure 2: Intersection of PWF Road and 576th Street

Source: Google Maps

PROJECT PARTIES

Jefferson County is the lead and sole project sponsor, but Project benefits are shared by many other public and private parties, as evidence by the numerous and varied community member letters of support. Jefferson County has recent experience receiving and delivering Federal funds; in 2020, the county was awarded $2.61 million from the Department of Commerce's Economic Development Administration (EDA). The EDA award supported the construction of a paved road and culverts to Endicott Clay Products (approximately nine miles southwest of the Project). Jefferson County is currently awaiting approval to bid the EDA project for 2022 construction.

GRANT FUNDS, SOURCES, AND USES OF PROJECT FUNDS

BUDGET

Table 1 summarizes the spending and funding sources for the Project. The county has already spent $7.55 million in local funds ($7.47 million for construction; $84,025 for preconstruction) on segment 1 of PWF Road. The preconstruction activities were completed in 2016 for the entire 13.5 miles of PWF Road at a cost of $252,000. The preconstruction costs are allocated between segment 1 (completed) and segments 2 and 3 covered by this Project. Incurred preconstruction costs were allocated between segment 1 and segments 2 and 3 based primarily on centerline mileage, with an additional 15 percent of total preconstruction costs were

allocated to segments 2 and 3 because of the extra preconstruction costs associated with replacing the structurally deficient 50-foot bridge on segment 3. This allocates nearly one third of incurred preconstruction and design phase spending to the already completed portion of PWF Road and the remaining two thirds to this Project. Jefferson County issued bonds to pay $7.47 million in construction costs to complete segment 1.

Table 1: Expenses and Associated Funding Sources

Eligible Expense Categories	Previously Incurred *Segment 1*	Previously Incurred *Segments 2 and 3*	Future *Local Funds*	Future *MPDG*	Total for Segments 2 and 3
Preconstruction & Development Phase*	$84,025	$167,975	$225,000	$0	**$392,975**
Construction	$7,467,000	$0	$2,096,360	$9,203,640	**$11,300,000**
Construction Contingencies	$0	$0	$209,640	$920,360	**$1,130,000**
Total	**$7,551,025**	**$167,975**	**$2,531,000**	**$10,124,000**	**$12,822,975**

*Includes planning, feasibility analysis, revenue forecasting, preliminary engineering, design work, environmental review

Segments 2 and 3 cost $12.82 million; the Rural grant will cover 80 percent of the future Project costs ($10.12 million), and local funds will cover the remaining $2.53 million.

FUNDING COMMITMENTS

Future expenses for construction and construction contingencies are split between two funding categories: local funding and MPDG funds, with 20 percent allocated to local funding and 80 percent allocated to the MPDG. Future costs related to preconstruction and development-phase activities, which will update the Project's environmental approvals particularly related to National Environmental Policy Act (NEPA) documentation, will be borne by the county. Local funding will be provided by county funds through bond issuance and/or a mill levy. Funding will be executed with approval from the County Board of Commissioners, which unanimously supports this Project and is "committed to bring this Project to fruition by any required county assets and support" (see letter on page iv).

PROJECT OUTCOME CRITERIA

SAFETY

Providing a safe and secure community is the highest priority in Jefferson County. This Project will address widely identified safety risks caused by poor pavement condition on PWF Road. There have been seven reported crashes on segments 2 and 3 in the five most recent years for which complete crash data is available (2016-2020).[2] None of the crashes involved alcohol, and one was a fatal crash (at the intersection of PWF Road and Highway 103). While the road's posted speed limit is 55 mph, the engineering team has estimated a safe speed on much of PWF Road to be approximately 10 mph below the posted speed limit, which is approximately the observed speed of much of the traveling public on segments 2 and 3.

[2] Nebraska State Government (n.d.). Nebraska Transportation Information Portal (NTIP). Accessed April 25, 2022. Retrieved from https://ntip.nebraska.gov/Map.

"In our profession, seconds count on saving peoples' lives. With the current condition of PWF Road, it can cost someone their life for us to take that extra 10 minutes to get to the hospital or to even get to the location of the call. If we have to take PWF Road to get to the location of the call, we have to take extra time to slow down to get to the call safely, so we don't end up in an accident ourselves. If we can't get to the call safely, we do no good to the people we are trying to help."

– Chief Jeff Nelson, Diller Fire and Rescue

risk compared with what it would be if the road were in good condition. This assertion is supported by the experience of the local community that uses the road. Numerous nearby residents, leaders, and officials have stated that there are many safety hazards due to the poor condition of PWF Road. Segments 2 and 3 of PWF Road that "have not been refinished" are "dangerous to drive" due to their bad condition (Kevin Sasse, local resident and farmer). These safety risks are worsened during poor weather conditions according to Douglass Lottman, President of Lottman Concrete Construction, who says that "it is not safe to take PWF" in snow, ice, or heavy rain. These conditions may also be most hazardous for young and inexperienced drivers. Jeff Nelson, the Diller Fire Chief, says that "there are many bad spots in the road that can affect a young driver's ability to control a vehicle," a sentiment that Diller-Odell Public Schools Superintendent Mike Meyerle

Poor pavement condition may increase the probability of there being more numerous and more serious crashes on PWF Road than there would otherwise be. Research shows that roads with rough or damaged pavement have higher crash rates than roads in better condition. According to Bock et al. (2011) "a one standard deviation increase in International Roughness Index (IRI) causes an increase in vehicle crashes large enough to move a safe road segment with no crashes in an average month to about 0.5 standard deviations above the average crash rate," and that this represents "a substantial decrease in traffic safety" due to the road condition.[3] The poor pavement condition increases crash

"Many times the gravel roads are better. However, we do have families that lives on the PWF, so it cannot be avoided completely. We have two school bus routes that use the PWF daily for school… The safety of our students and staff is my biggest concern. No one wants a bus on a rough road when meeting any traffic, especially large farm trucks and farm machinery. The bridge on this stretch of the PWF, that has been seeing consistent repairs for years, has always concerned me a great deal. We have a bus that goes over it every morning and afternoon. We have students who drive to school as early as 14 years of age, and they deserve to drive on roads that are as safe as possible."

– Mike Meyerle, Superintendent, Diller-Odell Public Schools

[3] Bock, M., Cardazzi, A. & Humphreys, B. R. (2021). *Where the Rubber Meets the Road: Pavement Damage Reduces Traffic Safety and Speed*. National Bureau of Economic Research. Working paper 29176. www.doi.org/10.3386/w29176.

echoes in saying that “No one wants a young driver rocked of the road due to bad road conditions when a deer jumps out in front of them.”

These conditions cause people to change their travel behavior to avoid PWF Road. Glen Behrends, the chairman of the Village of Diller, asserts that people often avoid PWF Road when traveling from Diller to Fairbury because the poor roadway condition is to dangerous, which is a belief echoed by Beth Roelfs, a Diller Community Foundation Fund member, who says that “the eastern part of [PWF] Road is dangerous enough that…a number of individuals choose to add time and miles” to their routes by detouring around PWF Road. PWF Road safety problems are unfortunately not new. Randy Sandman, President / CEO of Diller Telephone, says that the company has many employees who have to travel on PWF Road to work, and that they have been concerned about the “poor condition of the road and associated safety risks for MANY years” [emphasis original]. Reconstructing PWF Road with concrete pavement will remove the current safety hazards and will provide a resilient roadway that will serve county residents and visitors for decades.

Table 2: Safety Conditions Today, with Improvements, and without Improvements

Condition Today	Condition with Improvements	Condition without Improvements
Crumbling road surfaces can destabilize vehicles	The new smooth and even roadway surface provides a stable foundation for vehicles	Roadway condition remains the same or progressively worsens, aggravating risks
Drivers swerve to avoid potholes and areas of deterioration	The long-lasting resilient concrete surface avoids the formation of potholes, and travelers, especially new drivers, do not encounter areas of degraded pavement	Drivers continue to encounter potholes and areas of deterioration, which generally worsen or become more numerous due to limited counted maintenance funds
There are the most travel risks during inclement weather when conditions are already more dangerous or crumbling surface and potholes are not visible	The smooth and even roadway surface allows for more predictable travel during inclement weather, such as heavy rain, snow, and ice	Poor visibility during inclement weather continues to cause drivers to encounter potholes and areas of deterioration that they may not have seen or seen far in advance

STATE OF GOOD REPAIR

PWF Road on segments 2 and 3 is in poor condition with numerous potholes, uneven and crumbling pavement, and signs of asphalt deterioration including roughness, cracking, and rutting. The most severely damaged pavement can force vehicles to slow down or swerve.

This road is not part of the system for which data for common pavement measures such as roughness, cracking, and rutting are routinely collected through state or local programs. However, residents’ experiences and Figures 4, 5, and 6 speak clearly to the severity and extent of the pavement deterioration and the hazardous road conditions. Conversely, bridge condition data is regularly collected, and it reveals the bridge on segment 3 was built 87 years ago, is structurally deficient, in poor condition, and load posted.

The “poor” condition of PWF Road has “caused a major impact on the traveling public” (Glenn Behrends, Chairman of the Village of Diller), indicating that pavement deterioration is severe and widespread enough to impact essentially all travelers using segments 2 and 3. The Chief of

Diller Fire & Rescue agrees that problems are widespread as segments 2 and 3 have "many bad spots" such as "pot holes and rough parts of the road" that can make it a challenge "just to keep [a] vehicle on the road" (Chief Jeff Nelson). Not only are problems widespread, but they are severe since the condition of the "rough road" is bad enough that it is "hard for [EMS] to treat a patient" in an ambulance on the road (Chief Jeff Nelson).

After Jefferson County's major investment of local funds, pavement on segment 1 is in extremely good condition with smooth surfaces and long-lasting concrete pavement (Figure 3). Adjacent PWF Road segments in Gage County are also in good condition since they undergo maintenance treatments to preserve condition such as routine crack and seal maintenance. Additionally, this summer Gage County is preparing to complete an armor coat of PWF Road, which will cover the roadway surface to correct surface deficiencies and to extend the service life of the pavement.[4] By contrast, the pavement on segments 2 and 3 shows many visible signs of distress and deterioration, which are evident in the contrast between adjacent pavement in segments 1 and 2 (Figure 4). The fact that segments 2 and 3 are in much worse condition than the rest of PWF corridor means that replacing the poor-condition pavement on segments 2 and 3 will provide extremely good pavement along the entire 13.5-mile corridor which will serve residents and visitors for many decades.

Figure 3: Segment 1 of PWF Road, with Good Condition Pavement. Similar Condition Expected After Project for Segments 2 and 3

Figure 4: Change from Segment 1 (Reconstructed Good Condition Pavement) to Segment 2 (Poor Pavement within Project Area)

The pavement on segments 2 and 3 shows extensive and widespread signs of damage, including cracking and rutting (Figure 5 and Figure 6) and road edge damage (Figure 7), which has necessitated for numerous locations to be patched (Figure 8). This poor pavement condition causes many drivers to avoid the road entirely, and for those drivers who do use the road they must reduce speeds, endure rough conditions, and risk an uneven and possibly hazardous drive as they try to avoid major areas of pavement crumbling and potholes.

[4] Mark Khunke, Gage County Highway Department Superintendent. Telephone interview on May 4, 2022.

Figure 5: Areas of Extensive Pavement Cracking and Rutting on PWF Road

Figure 6: Areas of Rutting on PWF Road

Figure 7: Road Edge Damage on PWF Road

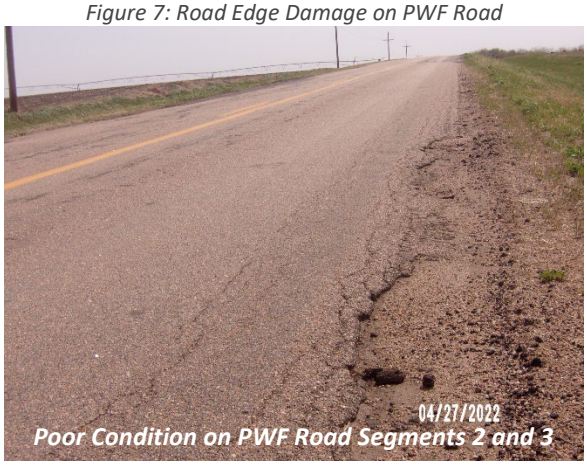


Figure 8: Extensive Road Patching on PWF Road

Not only is the pavement in poor condition, but so is the bridge that will be replaced as part of this Project (structure number C004813235). The bridge, as shown in Figure 9, is in poor condition according to federal condition definitions. This bridge was built in 1935 and currently is rated four ("poor") for superstructure and substructure condition. Figure 10 and Figure 11 show the superstructure condition, and Figure 12 shows the substructure condition. The bridge is rated a six ("fair") for deck condition (shown in Figure 13 and Figure 14). The bridge is load-posted (code P in field 41 of the National Bridge Inventory [NBI]), and there is an 18.6-mile detour length (field 19 of NBI). It is a scour critical bridge, with "bridge foundations [that are] determined to be unstable for calculated scour conditions" (item 113 of NBI[5]). As shown in Figure 14, the 50-foot bridge directly abuts the water, while the new 80-foot bridge will be longer to conform with modern bridge design standards. Both school buses and EMS vehicles use PWF Road and this bridge regularly, with four school bus routes having no choice but to use portions of PWF Road daily.

[5] Federal Highway Administration (1995). *Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges*. Report No. FHWA-PD-96-001. https://www.fhwa.dot.gov/bridge/mtguide.pdf.

Figure 9: Bridge to be Replaced

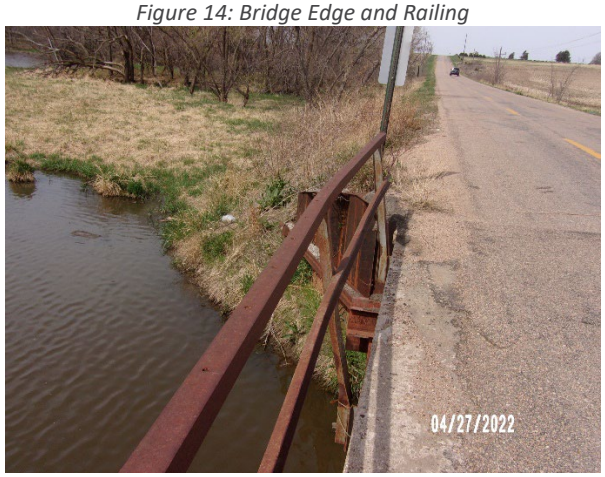
Figure 10: Bridge Superstructure (Lateral)

Figure 11: Bridge Superstructure (Underside)

Figure 12: Bridge Substructure and Abutment

Figure 13: Bridge Deck

Figure 14: Bridge Edge and Railing



The Project is making judicious use of funds to target the infrastructure that is in the worst condition. Another bridge (structure number C004813225) that is within project limits and was built in 1972 is in good condition overall (deck, superstructure, and substructure condition

ratings of 8) and is therefore not being affected by this Project beyond guardrails and bridge approaches.

The condition has caused the county to have to spend money just to keep the road and bridge functional without being able to improve its condition. The county has spent an average of $105,000 per year for at least the past five years on basic road maintenance for segments 2 and 3, for a total of $525,000 in spending. Without the Project it is expected that the county will need to continue spending approximately $105,000 each year for pavement reconstruction as shown in Table 3. This annual cost would likely increase over time as the road deteriorates further if not reconstructed. The new concrete road will require very little maintenance for the first 20 years of its life; essentially all annual maintenance spending could be avoided after the Project's completion, not only dramatically improving the road's condition but also freeing very limited maintenance and preservation funds to maintain other roadways in a good state of repair. The county expects to continue to spend at least $105,000 per year on pavement for this road for the next 20 years for a total cost of $2.10 million versus zero in pavement reconstruction spending for the 20 years after the Project is completed (Table 3). Similarly, the county conservatively estimate that it will spend $205,000 over the next 20 years maintaining the bridge without the Project, and with the Project estimated maintenance spending will shrink to just $10,000 (Table 4). Overall, the Project is expected to save the county $2.30 million in bridge maintenance and pavement reconstruction over the next 20 years.

Table 3: Expected Pavement Reconstruction Spending for Segments 2 and 3 of PWF Road

Activity	2022-2026	2027-2031	2032-2036	2037-2041	Total
Without Project ("No Build")	$525,000	$525,000	$525,000	$525,000	**$2,100,000**
With Project ("Build")	$0	$0	$0	$0	**$0**
Savings	**$525,000**	**$525,000**	**$525,000**	**$525,000**	**$2,100,000**

Table 4: Expected Bridge Maintenance for the Bridge that the Project will Replace (Structure C004813235)

Activity	2022-2026	2027-2031	2032-2036	2037-2041	Total
Without Project ("No Build")	$35,000	$50,000	$120,000	$0	**$205,000**
With Project ("Build")	$0	$0	$10,000	$0	**$10,000**
Savings	**$35,000**	**$50,000**	**$110,000**	**$0**	**$195,000**

Jefferson County has adequate resources and personnel to maintain and preserve the road, bridges, and culverts after Project completion. As noted, the concrete road will require very little maintenance for the first 20 years, as evidenced by the concrete road on segment 1 that was replaced in 2016, which has required very little maintenance for the first five years of its life. The bridge will be inspected annually, as are all bridges in the county, and preservation activities will be matched with it according to good life cycle management practices.

Table 5: Good Repair Conditions Today, with Improvements, and without Improvements

Condition Today	Condition with Improvements	Condition without Improvements
Segments 2 and 3 of PWF Road have extensive deterioration, with signs of crumbling, roughness, rutting, and cracking that are widespread	The new concrete pavement provides a smooth, even travel surface that lasts much longer than would an asphalt surface	Potholes are addressed as limited county maintenance funds allow, but generally continue to form and worsen
Segments 2 and 3 interrupt a corridor of otherwise much better pavement condition on PWF Road, interfering with the entire corridor's usage	The new pavement on segments 2 and 3 make a continuous corridor with good pavement condition	The pavement deterioration on segments 2 and 3 continues to cause some travelers to avoid the entire corridor
Jefferson County continues to spend $105,000 each year on pavement repairs that cannot improve the condition in any lasting way	The concrete pavement requires essentially no maintenance for at least the first 20 years of its life, allowing constrained county maintenance funds to be reallocated to other needs	Jefferson County spends $2.10 million extra in pavement maintenance work for segments 2 and 3 over the next 20 years
Bridge C004813235 is in poor condition, is load posted, and is scour critical	The bridge is in good condition and is no longer load posted or scour critical	The county's spending is not able to improve the bridge's condition in any lasting way
Bridge C004813235 directly abuts the water reservoir	The new, longer bridge has greater distance form water, minimizing water impacts	The old design is retained for the foreseeable future

ECONOMIC IMPACTS, FREIGHT MOVEMENT, JOB CREATION

AN IMPROVED PWF WOULD IMPROVE TRANSPORTATION EFFICIENCY FOR JEFFERSON COUNTY BUSINESSES AND EMPLOYEES

PWF Road is a key east-west link in the county's transportation system and enhances mobility and accessibility for auto users, trucks, farm vehicles, and emergency response vehicles. It also improves safety and reduces future road maintenance outlays (Appendix B – BCA).

AN IMPROVED PWF ROAD WOULD SUPPORT THE COMPETITIVENESS OF JEFFERSON COUNTY AGRICULTURE

Agriculture is the principal driver of Jefferson County's economy, contributing nearly $200 million to the county's gross domestic product (GDP) in 2021, comprising nearly 30 percent of the county's total GDP. Economic projections by Moody's anticipate three percent to four percent annual growth over the next decade. Farm employment accounts for about 15 percent of the county's total employment, with 470 farm proprietors supporting 700 out of the county's 4,800 total jobs.

With nearly 360,000 acres in agricultural use, representing 98 percent of the county's total land area, agricultural activity takes place throughout the county. While the average farm size is 608 acres, the median size is 278 acres, indicating a significant number of smaller farms. Of the 590 farms in the county, 83 percent are operated by a family or individual (2017 U.S. Agricultural Census). Transportation efficiency is particularly important to small farms and farms run by

families and individual proprietors because they must compete with larger operators who can achieve cost savings through economy of scale in other areas of production.

The county is a strong producer of grain commodities as well as livestock, primarily cattle. The most recent U.S. Agricultural Census (2017) shows that Jefferson County croplands produced 19 million bushels of corn for grain, 5.5 million bushels of soybeans, and 346,300 bushels of wheat for grain, and 27,927 dry tons of forage. The 2017 Agricultural Census Livestock Inventory counted nearly 50,000 head of cattle (including beef cows and milk cows), as well as hogs and pigs, sheep and lambs, and poultry.

Representatives from Jefferson County report that there are approximately 40 farms along the Project portion of PWF Road.[6] However, because farms and agricultural activities are widely distributed throughout the county, even farms located in other parts of the county may depend on PWF Road for a wide-range of business operations including:

- Receiving deliveries of products needed to plant/fertilize crops and to feed livestock;
- Delivering harvested crops and livestock to market, including by truck to area grain elevators and freight rail terminals;
- Moving agricultural equipment between non-contiguous fields and in/out of Jefferson County;
- Providing access to employees living in Fairbury, throughout Jefferson County, and the broader labor shed that includes Gage, Saline, and Thayer Counties;
- Providing access to agricultural equipment repair crews; and
- Providing access to veterinarians and other animal care service providers.

PWF Road is a key east-west link in the county's transportation system, as it is one of only a few paved roads serving that portion of the county. Currently, farm operators and employees face a choice when sending crops, livestock, heavy equipment, and service vehicles through that corridor: a long detour, which results in costly added staff and vehicle operating time, or the direct route across PWF Road where the degraded section adds to vehicle repair and maintenance costs and creates a stressful ride for livestock in trailers.

"[The PWF is] a main transportation pathway from our bin sites to Farmers Coop in Jansen and it greatly impacts how we market and transport grain."

– Joseph Schnuelle, Farmer

Livingston Enterprises, a major pork producer, exemplifies the need for transportation connectivity between facilities, markets, suppliers, and employees. The 40-year-old company is headquartered in Fairbury and has numerous facilities throughout the county, including 14 swine production facilities that house 35,000 sows and 1.2 million weaned pigs annually. The company also owns and operates LEI Mills, a grain mill north of Fairbury in Daykin, and Livingston Enterprise Transport, Inc. (LET). LET provides specialized livestock and feed transport, and facilities include a maintenance shop and state-of-the-art truck wash where

[6] Meeting with Mark Schoenrock, Chairman Jefferson County Board of Commissioners.

animal transport vehicles are disinfected, washed, and "baked" to maintain biosafety between farms. Across all operations, the firm employs approximately 200 people.

Agriculture is a global industry, and farms in Jefferson County must remain competitive with farms across the U.S. and around the world. An improved PWF Road would help Jefferson County's agriculture businesses maintain their competitiveness and continue to support the local population and contribute to the national agriculture industry.

AN IMPROVED PWF WOULD SUPPORT THE COMPETITIVENESS OF MAJOR COUNTY EMPLOYERS

Manufacturing is the second largest industry by employment in Jefferson County, accounting for 650 jobs, nearly 14 percent of total employment in the county. Manufacturing is performing well in Jefferson County and has grown at an average annual rate of 3.8 percent between 2010 and 2020, reaching more than 650 jobs.[7]

The strength of the manufacturing industry is driven by several major employers including[8]:

- **Endicott Clay Products**, an architectural brick manufacturer headquartered in Endicott with 250 workers in Jefferson County.
- **Westin Packaged Meats,** a subsidiary of Westin Foods, industry leader and leading producer of bacon bits, bacon pieces, and fully cooked bacon products at its state-of-the-art facility in Fairbury, providing 100 local jobs.
- **Prairie View Industries, Inc.**, a fabricated metal products firm that produces multifold aluminum wheelchair ramps with employment of nearly 100 in Jefferson County.
- **Lottman Concrete Construction**, a family-owned construction company specializing in commercial, industrial, and retail slabs on grade in Diller employing 40 people.
- **Diller Locker Company**, a U.S. Department of Agriculture (USDA) beef and pork processing company that provides slaughter, private label, co-packing, and seasonal whole carcass deer and wild game processing. The company operates separate slaughter and processing facilities in Diller with 40 employees.

"Diller has an overwhelming need for workers, but we are not pulling many from the west and I believe that this is due to the traveling conditions."

– Shelly Smith, Owner, Diller Locker

These firms draw employees from throughout the county, and some county employers have reported difficulty recruiting workers from areas that would require travel along the degraded portion of PWF Road. These manufacturing companies also use the road system to transport goods to market and to access consumer markets. These companies face competition from domestic and international companies. An improved PWF Road may help Jefferson County's major employers and manufacturers maintain their competitiveness and continue to support the local population and contribute to the national economy.

[7] U.S. Department of Commerce Bureau of Economic Analysis (Interactive Data, Series CAEMP25N Total Full-Time and Part-Time Employment by NAICS Industry, downloaded May 10, 2022).
[8] Meeting with Sharon Prifert, Fairbury Chamber of Commerce, Executive Director.

PWF Road is also an important east-west connection for service businesses such as Diller Telephone Company/Diode Communications, the area's broadband internet provider. General Manager Loren Duerksen reports that company vehicles try to avoid PWF Road when possible due to the potholes which damage the vehicles and create dangerous driving conditions. The result is longer travel times to customers, which as Mr. Duerksen states, reduces business efficiency as drivers and vehicles are occupied by "windshield time instead of billable time." Mr. Duerksen estimates that approximately 20 – 30 percent of the company's workforce comes from the west and face the choice of a much longer commute or traveling on PWF Road which significantly increases the wear and tear on their personal vehicles.

PWF Road provides access to the County's Major Tourism Destinations

According to a 2020 Economic Impact of Travel study conducted for the state's tourism agency, Nebraska Tourism Commission, visitor spending in Jefferson County brings $3.9 million annually into the local economy, supporting 110 jobs and adding approximately $100,000 to the local tax base. Rock Creek Station State Historical Park and Rock Creek Station State Recreation Area are the county's principal visitor destinations (Figure 1). PWF Road is the only paved roadway that provides access to these attractions, and signs on Highways 103, 136, 8, and 15 direct motorists to access these attractions via PWF Road.

Rock Creek Station State Historical Park encompasses 350 acres of prairie hilltops, timber-lined creeks, and dramatic ravines. The historical significance of the site dates back to the 1850s when it became a stop on the Pony Express, a supply station for emigrants traveling the Oregon-California Trail and a station for the Overland Stage Line. The park offers hiking, biking, and equestrian trails as well as picnic sites with tables, grills, and covered picnic shelters. It provides interpretive historical visits for school groups and bus tours. The park also hosts scientific researchers including recent and ongoing studies on bats, pollinators, and ticks.

The historical park is adjacent to **Rock Creek Station State Recreation Area**, a 40-acre campground with traditional campsites, recreational vehicle (RV) campsites served by electricity, and primitive campsites with corrals and water hydrants for equestrian camping.

The diverse range of activities available at these parks draws visitors year-round. Combined visitation is estimated to range from 20,000 to 25,000 per year, and visitor statistics published by the Nebraska Tourism Commission, indicate that about a third are from out-of-state. The park logged over 9,000 camp nights during the 2021 summer season. Due to the prominence of camping, RV tourism, and equestrian trails, many visitors arrive in large RVs or trucks pulling horse trailers. School groups and other group visitors travel to and from the site by bus. The park is also a popular destination for motorcycle groups. The poor quality of PWF Road presents an even greater challenge for these vehicles than it does for passenger cars.

Table 6: Economic Conditions Today, with Improvements, and without Improvements

Condition Today	Condition with Improvements	Condition without Improvements
Trucks serving agriculture and manufacturing businesses, and service fleet vehicles take long detours to avoid poor quality road	Trucks and service vehicles can take the most efficient route to markets	Reduced competitiveness/ productivity of agriculture, manufacturing, and service businesses
Trucks serving agriculture and manufacturing businesses, and service fleet vehicles incur increased wear and tear on fleet vehicles	Transportation cost saving from reduced repair and maintenance costs	Reduced competitiveness/ productivity of agriculture, manufacturing, and service businesses
Trucks and service fleet vehicles using PWF Road must travel at reduced speed due to road conditions	Transportation cost savings due to travel time reduction	Reduced competitiveness/ productivity of agriculture, manufacturing, and service businesses
Reduced labor market access for all Jefferson County employers	Improved access for employees living in Jefferson County to the regional labor market	Reduced competitiveness/productivity of employers in all industries
Visitors from throughout Jefferson County and beyond must use PWF Road to access key attractions, and therefore must travel slowly and incur wear and tear on vehicles	Reduced wear and tear on vehicles, improved travel speeds, and a more pleasant entry/exit to Rock Creek Station State Historical Park and Rock Creek Station State Recreation Area	Continued wear and tear on vehicles, reduced travel speeds, and a jarring entry/exit to Rock Creek Station State Historical Park and Rock Creek Station State Recreation Area

CLIMATE CHANGE, RESILIENCY, AND THE ENVIRONMENT

Environmental condition and resiliency are critical to the Jefferson County agricultural community. The Project directly improves resiliency and environmental condition by upgrading the culverts through the seven-mile corridor. Twenty-six culvert upgrades are identified for upgrades in the design plans and will improve hydraulic performance in a Flood Awareness Area, as identified by the Nebraska Department of Natural Resources (NDNR).[9] Flood Awareness Areas are floodplain boundaries that are produced which can be used as "best available data" for Nebraskan communities. PWF Road crosses Big Indian Creek tributaries and Big Indian Creek Reservoir 17-A. The new culverts will meet improved standards and prevent existing backwater issues in the Project area.

The Project may also reduce transportation-related pollution by eliminating the need for the nearly 18.6-mile bridge detour identified in the 'State of Good Repair' section as well as the eight-mile road detour identified in the 'Equity, Multimodal Options, and Quality of Life' section for vehicles beyond the load posting or in case severe weather damages the bridge. The detour avoidance has both an emissions benefit and a resiliency benefit. The U.S. Federal Emergency Management Agency (FEMA) National Risk Index rates Jefferson County with relatively moderate risk of drought, ice storm, riverine flooding, strong winds, tornados, and winter

[9] Nebraska Department of Natural Resources (2019). Floodplain Management Interactive Map. Accessed May 9, 2022. https://gis.ne.gov/portal/apps/webappviewer/index.html?id=7bc8738d3d8f4e87823cc604543b7ddf.

weather.[10] The unsafe, unpleasant, and inoperable condition of PWF Road prevents residents and emergency services alike from using the connection. As a result, the Project will provide an accessible route for use in times of emergency or as needed for detours and redundancy of other regional connections. According to FEMA, Jefferson County has seen 23 federal disaster declarations since 1952 (or one disaster declaration every three years on average). These disasters include 10 severe storms, seven floods, two severe ice storms and one tornado.[11] Additionally, the Project will be constructed using concrete rather than asphalt, a material choice that will support resiliency for years to come due to low maintenance needs. The existing subbase will also be recycled, reducing the need for additional materials as well as the offsite hauling.

Use of U.S. Environmental Protection Agency's EJScreen shows that population and pollution are not critical in the Project area, but the Project does fall under all three EJScreen critical service gaps (medically underserved, food desert, broadband gaps).[12] These critical service gaps are reinforced for those in the Project who must detour around PWF Road due to pavement condition. Improved transportation facilities will make the limited community connections easier, safer, and more accessible. Finally, the Project will avoid adverse impacts to air and water quality, wetlands, and endangered species as outlined in the 'Required Approvals' section.

Table 7: Climate Conditions Today, with Improvements, and without Improvements

Condition Today	Condition with Improvements	Condition without Improvements
Project sits within NDNR Flood Awareness Areas	Culverts and bridges are brought up to standard, minimizing backwater and improving hydraulic performance	Flood concerns are exacerbated by out-of-standard hydraulic infrastructure
Condition of the current PWF Road prevents active use during times of emergency, compromising resilience	PWF Road serves as a community connection for years to come, supported by a low maintenance material that will age with minimal need for repair	PWF Road continues to deteriorate and remain vulnerable to flooding. PWF Road cannot serve as a reliable connection during community resilience events

EQUITY, MULTIMODAL OPTIONS, AND QUALITY OF LIFE

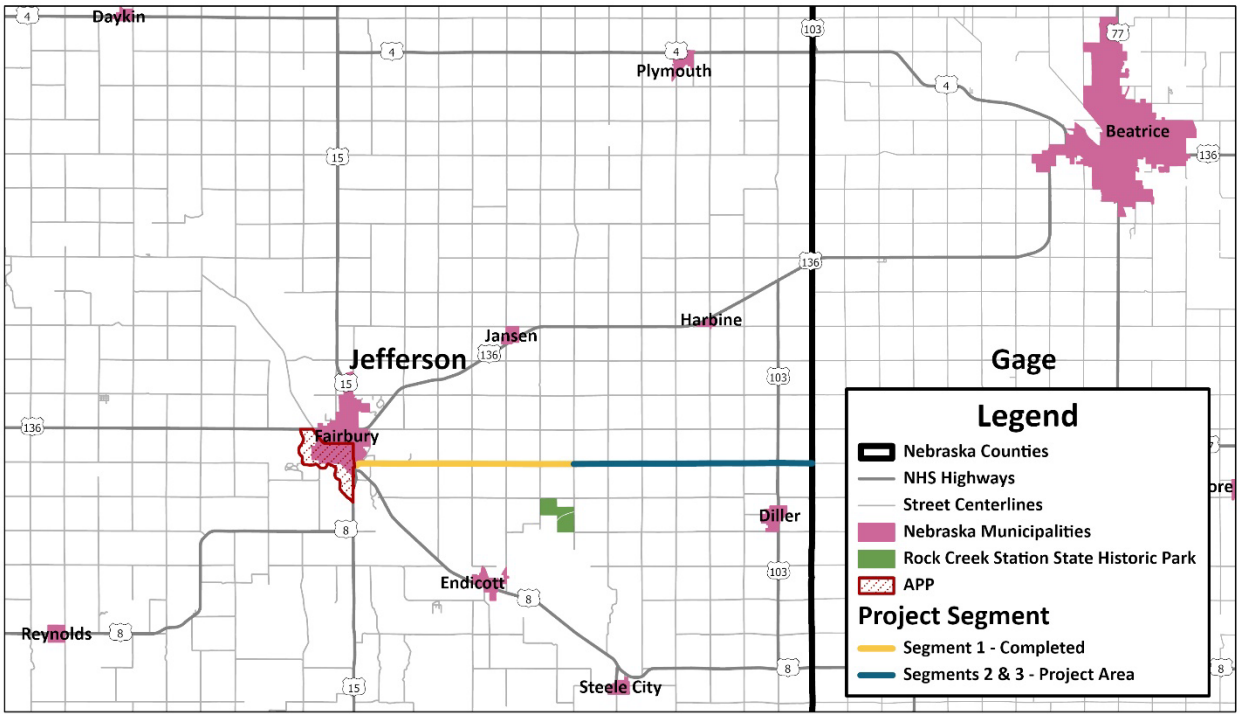
The Project will support rural economic activity and economic development in disadvantaged communities in Fairbury. While the Project location is not in an area of persistent poverty, 30 percent of the land area in Fairbury is located inside an area of persistent poverty, which is directly adjacent to the western end of PWF Road (segment 1) in Census Tract 9638.[13] This

[10] U.S. Federal Emergency Management Agency (2021). National Risk Index. Accessed May 4, 2022 https://hazards.fema.gov/nri/map.
[11] U.S. Federal Emergency Management Agency (February 2021). Disaster Declarations for States and Counties Data Visualization. Accessed May 11, 2022. https://www.fema.gov/data-visualization/disaster-declarations-states-and-counties.
[12] U.S. Environmental Protection Agency (2021). EPA's Environmental Justice Screening and Mapping Tool (Version 2.0). Accessed May 2, 2022. https://ejscreen.epa.gov/mapper/.
[13] U.S. Department of Transportation (n.d.). Areas of Persistent Poverty Project (APP) and Historically Disadvantaged Community (HDC) Status Tool. Accessed May 2, 2022. https://datahub.transportation.gov/stories/s/tsyd-k6ij.

disadvantaged community contains 15 percent of the county population. Based on letters the county has received and noted in this application, economic activity is being diverted from these disadvantaged communities because of the poor condition of PWF Road; many people and businesses living and operating near segments 2 and 3 drive a longer distance to Beatrice (which does not contain any disadvantaged communities or areas to persistent poverty) rather than going to Fairbury for goods and services.

Figure 15 shows the location of the area of persistent poverty in Fairbury relative to the Project. As Glen Behrends writes about his community, Diller, which is located just south of the Project location, "the poor condition of the road is forcing [Diller] community members to drive to Beatrice for necessities, groceries, parts, etc." which "results in a loss of tax revenue for Jefferson County" due to the lost economic activity. This Project is expected to set Fairbury, including the area of persistent poverty, on a more even footing and allow it to compete equally for economic opportunities after the Project is complete.

Figure 15: Locations of Area of Persistent Poverty (APP) and Rock Creek Station State Historical Park Relative to Project



Jefferson County has led public involvement efforts for this Project that included three public meetings in October 2014 at community centers in Fairbury and Diller. Holding the public meetings here ensured that people who use PWF Road or who live along it would be no more than eight miles from a public involvement meeting. Jefferson County included notices about the meetings in local newspapers to encourage attendance. The feedback that was received informed the bond issuance that later occurred to fund work on segment 1. Since these

> *"We avoid using PWF Road unless it is absolutely necessary that is the route to get to the call. We average having to avoid that road about 4-5 times a month for calls. Depending on what type of call it is, there could be anywhere from one to seven vehicles that avoid using PWF per call."*
>
> *– Chief Jeff Nelson, Diller Fire and Rescue*

meetings, Jefferson County's elected commissioners have continued informal discussions with the public about this project even while the local press has covered new developments.[14]

The Project will improve quality of life by improving access to healthcare and outdoor recreation and by increasing economic activity in disadvantaged communities. The poor pavement condition of PWF Road hinders EMS service provision and emergency care. The road condition is so bad that ambulances detour roughly seven miles to avoid PWF Road when transporting patients to a hospital in Fairbury from Eastern Jefferson County. While taking PWF Road would result in a 16-mile trip, ambulances take a 23-mile route using Highway 136 to the north for patients in or north of Diller and a 24-mile route using Highway 8 for patients south of Diller (Chief Jeff Nelson, Diller Fire and Rescue). These longer routes add time to receiving life-savings treatments at the hospital.

The PWF Road conditions also force residents of areas of persistent poverty who may work for businesses or farms best accessed by PWF Road to either accept a lengthy detour or to endure the slower speeds, bumpy conditions, and safety hazards that are experienced on PWF Road.

The Project will also improve quality of life by increasing access to unique amenities and recreational facilities, one of the largest of which is Rock Creek Station State Historical Park that is described in the 'Economic Impacts, Freight Movement, and Job Creation' section. The park is most easily accessed from the eastern portions of Jefferson County and from Gage County to the east using segments 2 and 3 of PWF Road (Figure 15). Other direct alternative routes require travel largely on dirt and gravel roads, so access to the park depends heavily on PWF Road. Access to the park is important not only because of its amenities and unique history, but also because there are few alternatives. The nearest alternate state park for residents to the east is over 30 miles away.

[14] Hopkins, G. (2022). "County Searches for Funding to Complete PWF Road." *The Fairbury Journal-News*. March 15, 2022. https://fairburyjournalnews.com/county-searches-for-funding-to-complete-pwf-road/.

Table 8: Quality of Life Conditions Today, with Improvements, and without Improvements

Condition Today	Condition with Improvements	Condition without Improvements
Economic activity is being diverted from Fairbury, which contains an area of persistent poverty	The condition of segments 2 and 3 of PWF Road will no longer act as a deterrent to economic activity, putting Fairbury on a level playing field	Segments 2 and 3 of PWF Road will continue to cause some businesses and residents of eastern Jefferson County to go to other locations for goods and services rather than Fairbury
Fairbury residents, including those of the area of persistent poverty, who are employed in businesses or farms along PWF Road segments 2 or 3 must generally endure its condition to reach work	These residents will benefit from the good PWF Road pavement and bridge conditions	Same as condition today
Residents of eastern Jefferson County and Gage County going to Rock Creek Station State Historical Park (RCSSHP) must either take a long detour or go over segments 2 and 3	People accessing Rock Creek Station State Historical Park from the east will benefit from the good PWF Road pavement and bridge conditions	Same as condition today

INNOVATION AREAS: TECHNOLOGY, PROJECT DELIVERY, AND FINANCING

INNOVATIVE TECHNOLOGIES

No innovative technologies have been identified for this Project.

INNOVATIVE PROJECT DELIVERY

Two core elements of the US Department of Transportation (USDOT) Innovation Principles are tackling the climate crisis and reducing deaths and serious injuries on our Nation's transportation network. The Project brings innovation to Jefferson County by providing a high-quality concrete road in an area primarily served by gravel roads. The improved concrete road will greatly increase the operational efficiency of PWF Road, reducing travel times along the roadway and eliminating lengthy detours currently used to avoid the poor-condition roadway. These reduced travel times and distances may generate significant emissions reductions, reducing the county's carbon footprint.

The construction process has also been designed to minimize greenhouse emissions. The roadway will be constructed by re-using the existing base materials for the improved road, eliminating the need to haul in a large amount of heavy base material and the need haul out the existing base material for disposal. Moving large volumes of heavy base material is carbon intensive, so reusing the existing material reduces greenhouse gas emissions from the construction process.

Finally, if not addressed, the continued degradation of the roadway will result in increasingly hazardous driving conditions. PWF Road is currently degraded to the point that attempts to repair and maintain the roadway are costly and no longer address the fundamental condition of the roadway. Replacing the existing patchwork asphalt roadway with a smooth, high quality

concrete roadway that is more durable and easier to maintain than asphalt provides meaningful cost savings to the county while delivering a safer roadway.

INNOVATIVE FINANCING

Local funding will be provided by county funds through bond issuance and/or a mill levy.

BENEFIT COST ANALYSIS

The benefit cost analysis (BCA) has been conducted following the guidance from the USDOT contained in Benefit-Cost Analysis Guidance for Discretionary Grant Programs (March 2022).[15] All costs and benefits are expressed in 2020 dollars and are discounted to 2020 (year zero for discounting) at a seven percent real discount rate (Appendix B).

PROJECT COSTS

The capital costs for the Project have been estimated at $12.82 million, in 2022 dollars. Jefferson County has incurred about $168,000 for segments 2 and 3, expressed in year of expenditure dollars. All costs have been adjusted in the BCA to 2020 dollars.

PROJECT BENEFITS

The BCA considered and estimated the following Project quantifiable and monetizable benefits:

- **Life cycle cost savings**. No Build maintenance costs exceed $100,000 annually.
- **Travel time savings for current traffic traversing the Project limits**. Travelers will save time as speeds will increase to the 55-mph speed limit.
- **Travel time savings farm equipment.** There are an estimated 250 farm vehicles using PWF Road segments 2 and 3 during planting and harvest season. The hourly value of farm operations is significant given labor costs, proprietor imputed income, and the value of agricultural commodities.
- **Vehicle operating cost savings**. About 100 vehicles daily are estimated to divert to a route which is over 20 miles longer than using seven miles of PWF Road.
- **Reduced delay emergency response vehicles**. Fire and emergency service experience delay and often divert to longer routes to avoid using PWF Road. Critical response vehicles will see improved response time.
- **Crash reductions**. PWF Road averages about one property damage only accident per year and one fatality over the past five years. Research indicates that rural roads in poor condition have about three times the rate of fatal accidents as other roads.

RESULTS

Based on the above, the Project has a Benefit Cost Ratio of 1.06, with an NPV of $600,000. Because traffic volumes are low in rural areas, and congestion is not a real problem, benefit cost ratios may be expected to be lower on average than projects in non-rural areas. The full BCA report is in Appendix B and the BCA results are summarized in Table 9.

[15] *Benefit-Cost Analysis Guidance for Discretionary Grant Programs | US Department of Transportation*. (2022). Transportation.gov. https://www.transportation.gov/office-policy/transportation-policy/benefit-cost-analysis-guidance-discretionary-grant-programs-0

Table 9: Benefit Cost Analysis Summary

Discounted Build Costs	
Capital Costs	$9,419,979
Operations & Maintenance	$75,534
Total Costs	**$9,495,513**
Discounted Benefits	
Life Cycle Cost Savings (avoided bridge and pavement maintenance No Build)	$880,830
Travel Delay Savings (existing traffic, auto, and truck)	$764,842
Travel Delay Savings (farm equipment)	$866,473
Vehicle Operating Cost Savings - Reduced Vehicular Diversion to Other Routes	$3,770,272
Emergency Vehicle Response Benefits (critical call delay costs)	$669,262
Crash reduction benefits	$3,141,171
Total Benefits	**$10,092,849**
Summary	
Benefit Cost Ratio	**1.06**
Net Present Value	**$597,336**

PROJECT READINESS AND ENVIRONMENTAL RISK

TECHNICAL FEASIBILITY

The Project includes pavement removal, roadway grading, culvert removal, culvert placement, box culvert construction, bridge replacement, guardrail upgrading, adding pavement approach sections to a bridge, concrete pavement, erosion control and seeding. The Project primary components include:

- **Road reconstruction:** New concrete pavement will be constructed along the entire length of the Project.
- **Culvert replacement:** 26 culverts will be replaced with box culverts with a greater water capacity than the existing culverts.
- **Bridge guardrail upgrades and approach pavement:** Bridge number C004813225, which is a concrete continuous stringer/multibeam or girder bridge built in 1972, will receive an upgraded guardrail and new pavement approach sections at each end of the bridge. The bridge is currently in good condition.
- **Bridge replacement:** Bridge number C004813235 will be replaced. The existing bridge is an 87-year-old structurally deficient 50-foot steel girder bridge with a concrete deck. It will be replaced with an 80-foot concrete girder bridge.

This Project is a continuation of segment 1 which was completed in 2016. Design plans for segments 1, 2, and 3 were developed simultaneously in April 2016. The Project is technically feasible. Segment 1 was completed 1.6 percent under its $7.59 million construction budget, and this Project is similar in scope with the largest difference in work types being the bridge replacement. Even though segment 1 work was completed under budget, a 10 percent construction contingency is included for this Project to reduce the risk of cost overruns. The same cost estimation methodology was used for all three segments with unit costs adjusted to account for recent increases in material and labor costs for segments 2 and 3. Project cost estimates were developed based on recent bid costs.

There are no significant risks associated with the Project. The following minor risks do not require additional mitigation.

- **Relocation of electrical poles:** Only six electrical poles along PWF Road will need to be relocated, just as they were for segment 1 of PWF Road. Relocation is the responsibility of the utility company since the poles reside on the county's right-of-way.
- **NEPA documentation:** The county will complete NEPA documentation. This is slightly different from PWF Road segment 1, where U.S. Army Corps of Engineers (USACE) conducted NEPA documentation as the lead federal agency of a completely locally funded project. NEPA documentation is expected to be straightforward and to require no special risk mitigation factors. NEPA documentation will include floodplain-related and wetlands-related assessments, both of which were completed for segment 1 without complication. The only previously detected wetlands impacts are for a very limited number of stream crossings and for the bridge replacement, which reduces risk by replacing the current bridge with a longer bridge with abutments greater distance from the reservoir that it passes over.

Jefferson County and any entities acting in its name on this or any project will protect the Title VI/Civil Rights of affected parties. This Project complies with Title VI/Civil Rights requirements. Public participation that occurred was open to the entire public. There have not been any Title VI lawsuits, investigations, or complaints filed or pending against Jefferson County within the past two years.

PROJECT SCHEDULE

Once Jefferson County is notified of the grant award, the county will begin either the bond process or the mill levy, environmental review, and project design updates. The Project has already been designed and design updates will begin immediately upon award. As soon as the award is announced, Jefferson County will also begin the environmental review process, which is expected to take eight months to complete, and the bond process, which will be completed prior to the bid process. The Project will be bid out approximately 11 months after award. Construction will begin in 15 months after award and will be completed within 21 months. The Project will take a maximum of 36 months to complete from start to finish.

TIMELINE

May 2022	Submittal of MPDG Rural Grant Application
TBD	MPDG Funds Announcement
Immediately upon award	Begin Bond Process
Immediately upon award	Begin Environmental Review
Immediately upon award	Begin Project Design Updates
8 months after award	Complete Environmental Review (NEPA)
10 months after award	Review of Project Design and Plans by the county
11 months after award	Advertisement of Project
Before bidding begins	Finalize Bond Process
12 months after award	Start of Opening of Bids
12 months after award	End of Opening of Bids
13 months after award	Award Contracts
15 months after award	Begin Construction
36 months after award	Construction Completion

REQUIRED APPROVALS

ENVIRONMENTAL PERMITS AND REVIEWS

The NEPA clearance process will take place after the grant has been awarded. Based on review of the Project scope and limits, the Project does not involve the need for additional right of way and therefore meets the criteria for a Categorical Exclusion (CE). While the Project extends past the previously permitted area, it is anticipated that the Project will similarly avoid environmental impact and achieve CE without issues. Therefore, the NEPA process should not interfere with the Project's ability to begin construction within 25 months of award. Public involvement for the Project occurred in 2014, and more details are in the 'Equity, Multimodal Options, and Quality of Life' section (pages 18 and 19).

STATE AND LOCAL APPROVALS

The Project is included in Jefferson County's One- and Six-Year Road Plan, which highlights high priority local work and is required for local projects to be eligible for state funds.[16] Additionally, the bridge to be replaced (C004813235) is on the list of eligible structures for Nebraska DOT's County Bridge Match Program.[17]

FEDERAL TRANSPORTATION REQUIREMENTS AFFECTING STATE AND LOCAL PLANNING

The Project is not in a Metropolitan Planning Organization (MPO) area, and it is not part of the state system, so it is not listed and does not need to be listed in a metropolitan transportation plan (MTP), transportation improvement program (TIP), or statewide transportation improvement program (STIP).

[16] Jefferson County (n.d.) Summary of One- and Six-Year Plan. 2017 NBCS Interim Form. https://southeastncn.images.worldnow.com/library/77d54890-04c7-431e-8d3a-8e1f405468df.pdf.
[17] Nebraska DOT

ASSESSMENT OF PROJECT RISKS AND MITIGATION STRATEGIES

In summary, this Project carries few risks. There are no known environmental or permitting issues that would cause a delay in constructing this Project. No right-of-way acquisition or utility relocation is required to begin and complete this Project. The most significant risk, based on recent inflationary cost increases, is the concern for cost inflation to drive the Project over budget. Jefferson County has mitigated this risk by including 10 percent contingency funds in the cost estimate. The cost estimates are based on construction projects in southeast rural Nebraska. Value engineering can occur during final design if needed.

Jefferson County's lack of experience with U.S. Department of Transportation project delivery may also be considered a risk. However, the county is successfully delivering a recent U.S. Department of Commerce grant and utilizes a professional engineering firm for county engineering services. This firm, with a rich history of delivering USDOT projects, will be supporting and overseeing project delivery.

PROJECT REQUIREMENTS

Table 10 details how the Project components meet the statutory selection requirements.

Table 10: U.S.C. 173 Rural Statutory Selection Requirements

U.S.C. 173 Rural Statutory Selection Requirement	*Relevant Project Component(s)*
The Project will generate regional economic, mobility, or safety benefits	**Economic Benefits**: The Project will improve the local agriculture and manufacturing economy (Table 6). **Mobility Benefits**: This current disrepair of PWF Road impacts the mobility for residents and businesses alike. As noted in the application, concrete pavement will allow residents, EMS, farm equipment vehicles to access PWF Road and not use detours to access businesses, emergency calls, agricultural fields and facilities. **Safety Benefits**: This Project will address widely identified safety risks caused by PWF Road poor pavement condition (Table 2).
The Project will be cost effective	The Project has a benefit cost ratio of 1.06 and NPV of $600,000.
The Project will contribute to one or more of the national goals described under Section 150	The Project will contribute to the national Safety, Infrastructure Condition, and Freight Movement and Economic Vitality goals.
The Project is based on the results of preliminary engineering	The Project's design and engineering plans were completed in 2016 by Speece-Lewis Engineers.
The Project is reasonably expected to begin no later than 18 months after the date of obligation of funds for the Project	The Project will begin immediately upon award, starting with the bond process. The bond process will be completed prior to the start of opening bids, which is expected to occur no more than 12 months after the award.