

## **FY 2022 Bridge Investment Program (BIP) Bridge Projects Application Template**

This FY 2022 BIP Application Template is provided to assist project sponsors who intend to apply for a Bridge Project FY 2022 BIP grant. Interested eligible applicants should read the FY 2022 BIP Notice of Funding Opportunity (NOFO) in its entirety and especially where noted in this application template to submit eligible and competitive applications.

### **Basic Project Information**

Provide a narrative for the below items on basic details pertinent to the project, including project name, description, location, involved parties, etc. Items in this section will be used to determine grant program eligibility as detailed in Section C of the NOFO.

<b>Project Name</b>	Lancaster County Nebraska - 5 County Bridges
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<p>Eligibility Criteria Project Description (Replacement, Rehabilitation, Preservation, or Protection projects, including bridge bundling and NBIS culvert replacement and rehabilitation)</p>	<p>Beginning in 2020, Lancaster County Engineering Department (LCED) began funding engineering design for bridge replacement projects that were in the 1 and 6 Year Road and Bridge Program, but did not have imminent construction funding. LCED intended that, once design was completed, they could be let immediately if funding sources were identified.</p> <p>LCED has five bridges that have been selected for this grant application that meet the priority consideration criterion of being in poor condition or in danger of becoming poor – all five bridges are currently in poor condition. These five were chosen as funding for their construction has been cut from this year’s budget and previous budgets. The designed replacement for two of these bridges are considered “on-the-shelf”, with final plans and the Corps of Engineers permit verification received; they are ready to be let once the acquisition of funding and any additional requirements, NEPA processes, and/or permitting are completed. At least one more will be designed before the end of year. All of the structures fulfill the priority consideration criterion of being able to proceed to final design within 12 months of NEPA completion. As these structures were originally intended to be completed without federal funding, final design has begun on all structures without beginning the NEPA process; however, it is anticipated that all investigations will warrant Categorical Exclusions. In the event that any of these bridges are elevated to Environmental Assessments, LCED will follow the required processes to investigate and consider all appropriate alternatives. As these structures do not have full funding identified for construction, they all satisfy the final priority consideration criterion of construction commencing prior to September 30, 2025 being unlikely.</p> <p>The selected bridges are listed below:</p> <p>C005511215 (C-253). This bridge is currently open, and load posted  C005500625 (C-284). This bridge is currently open  C005543520 (G-222). This bridge is currently open, and load posted  C005514415 (Q-110). Bridge currently closed  C005506445 (X-129). Bridge currently closed</p> <p>Bridge C005511215 (C-253) – This is a steel I-beam bridge in poor condition, located on a gravel road. It was constructed in 1940. It was closed briefly in 2021 due to a deck spall over a fascia beam. It is listed as scour-susceptible by LCED, meaning it is in danger of becoming scour-critical with future degradation. It is therefore at risk of additional closures and disrupting traffic. The structure is slated to be replaced</p>
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with a press brake tub girder (PBTG) bridge. Due to site and corridor constraints, it will not be significantly widened.

Bridge C005500625 (C-284) – This is a steel I-beam bridge in poor condition, located on a major collector paved road. It was constructed in 1964. It was closed briefly in 2021 to break back and replace the ends-of-floor. It is at risk of future closures due to deterioration of the structure. It is slated to be replaced with a concrete box culvert. The replacement will allow for future widening of the roadway.

Bridge C005543520 (G-222) – This is a decked steel girder bridge in poor condition, located on a minor collector gravel road. It was built in 1948 and reconstructed in 1964. The open pile bents have had pile replaced above the ordinary high water line. The superstructure is outdated and includes a pin-and-hanger joint. These existing issues put it at risk of future closures. It is slated to be replaced with a prestressed concrete girder bridge, and design has been completed. It will be widened to meet the demands of future traffic.

Bridge C005514415 (Q-110) – This is a concrete double-T bridge in poor condition, located on a gravel road graded for paving. It was built in 1970. It is currently closed. The structure is scour critical and it is located just east of the limits of the City of Lincoln on a road graded for paving, in a corridor expected to see substantial growth. The structure needs to be replaced to remove it from the scour critical inventory and to ensure the corridor is allowed to grow. It is slated to be replaced with a PBTG bridge, and the design is nearly complete. It will be widened to meet the demands of future traffic.

Bridge C005506445 (X-129) – This is a precast deck-panel bridge in poor condition, located on a major collector paved road. It was built in 1963. It is currently closed. The structure is scour critical. The corridor is near the City of Hickman and a recreation area, and therefore has potential to experience substantial growth. It is slated to be replaced with a concrete slab bridge, and the design has been completed. It will be widened to meet the demands of future traffic.

All of these structures are aging, with 4 of the 5 being recently or currently closed. They are all designed and constructed to outdated standards and most are experiencing scour issues in their streambeds, which have degraded significantly since construction. Two of them are load posted. At least two of the corridors hosting these bridges are expected or likely to see substantial growth over the next twenty years, which makes replacement of these bridges imperative to prevent creating congestion on adjacent corridors and to allow for efficient

	<p>movement of people and goods. Further details are provided in the application packet.</p> <p>Lancaster County Engineering Department has made great strides in improving the condition of county infrastructure, and this grant will allow us to advance design and construction of these bridges by a substantial margin, further improving the county infrastructure and improving the quality of life and ease of transportation countywide.</p>
BIP Request Amount (minimum grant award is \$2.5 million):	Exact amount in year-of-expenditure dollars: \$ 9,915,020
Total Project Cost (total project cost cannot exceed \$100 million for Bridge Projects):	Estimate in year-of-expenditure dollars: \$ 12,393,775
Applicant:	A political subdivision of a State or local government
Maintenance Commitment	Lancaster County's Maintenance Commitment is in the attached documents.
Bike and Pedestrian Accommodation required by 23 U.S.C. 217(e)	As four of these five structures are located on gravel roadways and all are rural, no work to evaluate sidewalks or bike lanes to accommodate non-motorized traffic is planned as a part of this project. However, every structure except for C-253 is being widened sufficiently to accommodate a future paved shoulder that can provide for non-motorized traffic. Q-110 is on a road that has already been graded for paving and is anticipated to be paved once the corridor is annexed by the city of Lincoln. X-129 will also restore a paved link between major roadways and local campgrounds, providing a safer, more direct access for cyclists.

***Additional Project Information***

List State(s) in which the project is located:	Nebraska
Does the project serve an urban or rural community?	Rural
List all Project Co-Applicants:	Lancaster County
Identify the Lead Applicant (who will also be the applicant responsible for administration of BIP funds if application is selected, and the point of contact for the application)	Lancaster County
Was an application for USDOT discretionary grant funding for this project previously submitted?	No. This is the first year.
Is the project located (entirely or partially) in Federal or USDOT designated areas?	No.

### National Bridge Inventory Data

For each bridge on the project, fill out the NBI data in the following form. For projects with multiple bridges, including those utilizing bridge bundling, this table should be duplicated and populated with data for each individual bridge. This data is used to support and verify statements made about the project in other sections in this application template, as noted in Section D.2.d.II of the NOFO. Data, format, and coding information can be downloaded from [Download NBI ASCII files - National Bridge Inventory - Bridge Inspection - Safety Inspection - Bridges & Structures - Federal Highway Administration \(dot.gov\)](#):

#### *Identification*

Item 1 – State Code & Name	31
Item 8 – Structure Number	C005511215
Item 5A – Record Type	1
Item 3 – County Code & Name	109
Item 6 – Feature Intersected	LITTLE SALT CR (C 253)
Item 7 – Facility Carried	W BRANCHED OAK RD
Item 16 - Latitude	40.582352
Item 17 – Longitude	-96.444776

#### *Classification*

Item 112 – NBIS Bridge Length	Y
Item 104 – Highway System of Inventory	0
Item 26 – Functional Classification	9
Item 110 – Designated National Network	0
Item 21 – Maintenance Responsibility	2
Item 22 – Owner	2

***Age and Service***

Item 27 – Year Built	1940
Item 106 – Year Reconstructed	0
Item 42 – Type of Service	On Bridge – 1                      Under Bridge - 5
Item 28A – Lanes on the Structure	2
Item 29 – Average Daily Traffic	76
Item 109 – Average Daily Truck Traffic	0
Item 19 – Bypass, Detour Length	30

***Structure Type and Material***

Item 43 – Structure Type, Main	2
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***Condition***

Item 58 – Deck Condition	3
Item 59 – Superstructure Condition	6
Item 60 – Substructure Condition	6
Item 61 – Channel and Channel Protection	5
Item 62 – Culverts	N

***Geometric Data***

Item 49 – Structure Length	9.8
Item 50 – Curb of Sidewalk Widths	0.1
Item 51 – Bridge Roadway Width, curb-to-curb	7.1

Item 52 – Deck Width, out-to-out	7.4
Item 32 – Approach Roadway Width	9.1
Item 47 – Inventory Route, Total Horizontal Clearance	7.1
Item 53 – Minimum Vertical Clearance over Bridge Roadway	99.99
Item 54 – Minimum Vertical Underclearance	0
Item 55 – Minimum Lateral Underclearance on Right	0
Item 56 – Minimum Lateral Underclearance on Left	0

***Load Rating and Posting***

Item 70 – Bridge Posting	3
Item 41 – Structure Open, Posted, or Closed to Traffic	K

***Appraisal***

Item 113 – Scour Critical Bridges	4
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***Inspections***

Item 90 – Inspection Date	11/10/2021
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***Identification***

Item 1 – State Code & Name	31
Item 8 – Structure Number	C005500625
Item 5A – Record Type	1
Item 3 – County Code & Name	109



Item 6 – Feature Intersected	STREAM (C 284)
Item 7 – Facility Carried	W AGNEW RD/FAS3380
Item 16 - Latitude	41.005940
Item 17 – Longitude	-96.410312

***Classification***

Item 112 – NBIS Bridge Length	Y
Item 104 – Highway System of Inventory	0
Item 26 – Functional Classification	7
Item 110 – Designated National Network	0
Item 21 – Maintenance Responsibility	2
Item 22 – Owner	2

***Age and Service***

Item 27 – Year Built	1964
Item 106 – Year Reconstructed	0
Item 42 – Type of Service	On Bridge – 1                      Under Bridge - 5
Item 28A – Lanes on the Structure	2
Item 29 – Average Daily Traffic	380
Item 109 – Average Daily Truck Traffic	0
Item 19 – Bypass, Detour Length	30

***Structure Type and Material***

Item 43 – Structure Type, Main	2
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**Condition**

Item 58 – Deck Condition	4
Item 59 – Superstructure Condition	4
Item 60 – Substructure Condition	4
Item 61 – Channel and Channel Protection	7
Item 62 – Culverts	N

**Geometric Data**

Item 49 – Structure Length	6.7
Item 50 – Curb of Sidewalk Widths	0.5
Item 51 – Bridge Roadway Width, curb-to-curb	7.3
Item 52 – Deck Width, out-to-out	8.2
Item 32 – Approach Roadway Width	6.7
Item 47 – Inventory Route, Total Horizontal Clearance	7.3
Item 53 – Minimum Vertical Clearance over Bridge Roadway	99.99
Item 54 – Minimum Vertical Underclearance	0
Item 55 – Minimum Lateral Underclearance on Right	0
Item 56 – Minimum Lateral Underclearance on Left	0

***Load Rating and Posting***

Item 70 – Bridge Posting	5
Item 41 – Structure Open, Posted, or Closed to Traffic	A

***Appraisal***

Item 113 – Scour Critical Bridges	7
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***Inspections***

Item 90 – Inspection Date	7/14/2022
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***Identification***

Item 1 – State Code & Name	31
Item 8 – Structure Number	C005543520
Item 5A – Record Type	1
Item 3 – County Code & Name	109
Item 6 – Feature Intersected	SALT CREEK (G 222)
Item 7 – Facility Carried	N 98TH STCOLL 7833
Item 16 - Latitude	40.541764
Item 17 – Longitude	-96.351068

***Classification***

Item 112 – NBIS Bridge Length	Y
Item 104 – Highway System of Inventory	0
Item 26 – Functional Classification	8
Item 110 – Designated National Network	0

Item 21 – Maintenance Responsibility	2
Item 22 – Owner	2

***Age and Service***

Item 27 – Year Built	1948
Item 106 – Year Reconstructed	1964
Item 42 – Type of Service	On Bridge – 1                      Under Bridge - 5
Item 28A – Lanes on the Structure	2
Item 29 – Average Daily Traffic	119
Item 109 – Average Daily Truck Traffic	0
Item 19 – Bypass, Detour Length	30

***Structure Type and Material***

Item 43 – Structure Type, Main	2
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***Condition***

Item 58 – Deck Condition	4
Item 59 – Superstructure Condition	6
Item 60 – Substructure Condition	5
Item 61 – Channel and Channel Protection	6
Item 62 – Culverts	N

***Geometric Data***

Item 49 – Structure Length	91.4
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Item 50 – Curb of Sidewalk Widths	0.3
Item 51 – Bridge Roadway Width, curb-to-curb	7.3
Item 52 – Deck Width, out-to-out	8
Item 32 – Approach Roadway Width	9.1
Item 47 – Inventory Route, Total Horizontal Clearance	7.3
Item 53 – Minimum Vertical Clearance over Bridge Roadway	99.99
Item 54 – Minimum Vertical Underclearance	0
Item 55 – Minimum Lateral Underclearance on Right	0
Item 56 – Minimum Lateral Underclearance on Left	0

***Load Rating and Posting***

Item 70 – Bridge Posting	3
Item 41 – Structure Open, Posted, or Closed to Traffic	P

***Appraisal***

Item 113 – Scour Critical Bridges	5
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***Inspections***

Item 90 – Inspection Date	11/19/2021
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***Identification***

Item 1 – State Code & Name	31
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Item 8 – Structure Number	C005514415
Item 5A – Record Type	1
Item 3 – County Code & Name	109
Item 6 – Feature Intersected	STEVENS CREEK (Q 110)
Item 7 – Facility Carried	PINE LAKE RD
Item 16 - Latitude	40.442652
Item 17 – Longitude	-96.323696

***Classification***

Item 112 – NBIS Bridge Length	Y
Item 104 – Highway System of Inventory	0
Item 26 – Functional Classification	9
Item 110 – Designated National Network	0
Item 21 – Maintenance Responsibility	2
Item 22 – Owner	2

***Age and Service***

Item 27 – Year Built	1970
Item 106 – Year Reconstructed	0
Item 42 – Type of Service	On Bridge – 1                      Under Bridge - 5
Item 28A – Lanes on the Structure	2
Item 29 – Average Daily Traffic	135
Item 109 – Average Daily Truck Traffic	5

Item 19 – Bypass, Detour Length	30
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***Structure Type and Material***

Item 43 – Structure Type, Main	4
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***Condition***

Item 58 – Deck Condition	5
Item 59 – Superstructure Condition	5
Item 60 – Substructure Condition	3
Item 61 – Channel and Channel Protection	4
Item 62 – Culverts	N

***Geometric Data***

Item 49 – Structure Length	13.4
Item 50 – Curb of Sidewalk Widths	0.3
Item 51 – Bridge Roadway Width, curb-to-curb	8.5
Item 52 – Deck Width, out-to-out	9.1
Item 32 – Approach Roadway Width	8.5
Item 47 – Inventory Route, Total Horizontal Clearance	8.5
Item 53 – Minimum Vertical Clearance over Bridge Roadway	99.99
Item 54 – Minimum Vertical Underclearance	0

Item 55 – Minimum Lateral Underclearance on Right	0
Item 56 – Minimum Lateral Underclearance on Left	0

***Load Rating and Posting***

Item 70 – Bridge Posting	0
Item 41 – Structure Open, Posted, or Closed to Traffic	K

***Appraisal***

Item 113 – Scour Critical Bridges	3
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***Inspections***

Item 90 – Inspection Date	10/2/17
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***Identification***

Item 1 – State Code & Name	31
Item 8 – Structure Number	C005506445
Item 5A – Record Type	1
Item 3 – County Code & Name	109
Item 6 – Feature Intersected	HICKMAN BRANCH (X 129)
Item 7 – Facility Carried	PANAMA RD/FAS 3270
Item 16 - Latitude	40.354560
Item 17 – Longitude	-96.384920

***Classification***

Item 112 – NBIS Bridge Length	Y
Item 104 – Highway System of Inventory	0



Item 26 – Functional Classification	7
Item 110 – Designated National Network	0
Item 21 – Maintenance Responsibility	2
Item 22 – Owner	2

***Age and Service***

Item 27 – Year Built	1963
Item 106 – Year Reconstructed	0
Item 42 – Type of Service	On Bridge – 1                      Under Bridge - 5
Item 28A – Lanes on the Structure	2
Item 29 – Average Daily Traffic	260
Item 109 – Average Daily Truck Traffic	0
Item 19 – Bypass, Detour Length	30

***Structure Type and Material***

Item 43 – Structure Type, Main	22
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***Condition***

Item 58 – Deck Condition	2
Item 59 – Superstructure Condition	2
Item 60 – Substructure Condition	4
Item 61 – Channel and Channel Protection	5

Item 62 – Culverts	N
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***Geometric Data***

Item 49 – Structure Length	18.9
Item 50 – Curb of Sidewalk Widths	0.3
Item 51 – Bridge Roadway Width, curb-to-curb	8.3
Item 52 – Deck Width, out-to-out	8.9
Item 32 – Approach Roadway Width	8.5
Item 47 – Inventory Route, Total Horizontal Clearance	8.3
Item 53 – Minimum Vertical Clearance over Bridge Roadway	99.99
Item 54 – Minimum Vertical Underclearance	0
Item 55 – Minimum Lateral Underclearance on Right	0
Item 56 – Minimum Lateral Underclearance on Left	0

***Load Rating and Posting***

Item 70 – Bridge Posting	5
Item 41 – Structure Open, Posted, or Closed to Traffic	K

***Appraisal***

Item 113 – Scour Critical Bridges	1
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***Inspections***

Item 90 – Inspection Date	5/4/2022
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### **Project Selection Criteria**

Provide narrative response how the project responds to the project selection criteria in Section E.1.b of the NOFO. In responding to project selection criteria, refer to statutory selection criteria included in Section E of the NOFO and address them in the appropriate project selection criteria.

<p><b>Criteria #1: State of Good Repair</b></p>	<p>All bridges bundled with this project are rated Poor: Q110, X129, G222, C253, C284. Details are provided below:</p> <p>C-253 is an I-beam bridge constructed in 1940. The deck of the structure is experiencing extreme pitting and a severe spall that exposed the end of a fascia beam resulted in a temporary closure in 2021, until the deck could be repaired. As of August 2022, the deck is rated poor, and the superstructure and substructure are rated fair. The structure is regarded as scour susceptible (a designation assigned by the county to describe structures at risk of becoming scour critical with additional streambed degradation) with a timber backwall, exposing it to severe risks of deterioration and falling into poor condition. The scour risks and the presence of the timber backwall preclude a simple redeck as a rehabilitation option. The structure must be replaced to restore it to SOGR. Inspection reports are provided in the appendices.</p> <p>C-284 is an I-Beam Bridge built in 1964. The deck, superstructure, and substructure were all rated poor in 2020. A project in 2021 broke back each end of the deck to replace it with sound concrete, resulting in an increase of the deck rating back to fair. The remainder of the deck continues to age, however, and the other components of the bridge have not been improved. This structure must be replaced in order to restore it to SOGR. Inspection reports are provided in the appendices.</p> <p>G-222 is a decked steel girder bridge built in 1948 and reconstructed in 1964. The structure has a deck rated poor and an open pile bent substructure rated fair. This substructure has been repaired in the past, including having pile cut and spliced with new lengths of pile near the ordinary high-water elevation. The channel regularly carries debris into the open pile substructure during flood events, putting it at risk of large deformations that could compromise the integrity of the substructure. Additionally, while the superstructure is rated fair, it includes a dated pin-and-hanger joint that adds a greater risk of the superstructure rapidly deteriorating. The FHWA analytics from <a href="https://infobridge.fhwa.gov/data">infobridge.fhwa.gov/data</a> assigns a 2-year lower bound on the probability of the substructure structure becoming poor, with a lower bound of 4 years on the superstructure becoming poor, thus showing a chance of every structural element falling into poor condition within 5 years. Such a circumstance carries a risk of the bridge being closed, which will threaten future transportation efficiency in the area. Replacement of the bridge as a whole with a structure designed to current standards is necessary to restore it to SOGR. Inspection reports are provided in the appendices.</p> <p>Q-110 is a scour-critical concrete double-T girder bridge erected in 1970. The deck, superstructure, and substructure were last rated in fair condition in 2017. This structure was closed to traffic in 2019 before its next scheduled rating inspection, after the streambed scoured beneath the bottom of the lowest backwall plank at abutment number 2; as such, the bridge cannot meet the load demands of any traffic. The structure is on a road graded for paving and expected to see substantial growth once paving is completed;</p>
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failing to reopen the bridge will threaten future transportation efficiency in this area. The stream bed flowline is 20 feet beneath the bridge deck due to stream bed degradation; as such, this structure is scour critical and needs to be replaced with a larger bridge for it to become resilient to extreme events. Therefore, this structure must be replaced to restore it to SOGR. As the structure is closed, there are no current maintenance costs beyond maintaining the closure and performing scour-critical inspections; however, the replacement of the bridge and the resulting maintenance performed on it will provide benefits exceeding the costs. Inspection reports are provided in the appendices.

X-129 is a concrete precast deck-panel bridge built in 1963. The deck and superstructure were rated poor in May 2018, with the substructure rated fair, though scour critical. A month later, the bridge was closed after a special scour inspection due to severe undermining of the abutment and approach. Subsequent inspections have determined that the deck and superstructure are now rated critical with the substructure rated poor. As the structure is closed, the bridge cannot meet the load demands of any traffic. If the structure is not replaced, it will not be reopened and it will threaten future transportation efficiency in the area. This structure is scour critical and needs to be replaced with a larger bridge in order for it to become resilient to extreme events. The structure must be replaced to restore it to SOGR. As the structure is closed, there are no current maintenance costs beyond maintaining the closure and scour-critical inspections; however, the replacement of the bridge and the resulting maintenance performed on it will provide benefits exceeding the costs. Inspection reports are provided in the appendices.

The current state of the practice of the Nebraska Department of Transportation is to begin looking aggressively at replacement when a bridge is more than 70 years old. Of the three structures not currently closed, two meet that criterion (G-222 and C-253).

As proof that these bridges will be maintained in good repair, we have provided signed maintenance certificates as a commitment to the preservation of the new structures.

<p><b>Criteria #2: Safety</b></p>	<p>All structures in this project feature outdated rail and buttress elements that were not designed to modern standards and were likely never crash tested under NCHRP Report 350 nor MASH. As a matter of course, all bridge replacements will evaluate and design safety appurtenances including guardrail, end terminals, rail transitions to the bridge buttresses and/or providing crash cushions on the buttresses, meeting all requirements of the Roadside Design Guide and other applicable roadside safety specifications. For each bridge this will accomplish the following:</p> <ol style="list-style-type: none"> <li>1) Remove outdated and potentially dangerous elements from the structures</li> <li>2) Protect motorized travelers from the health/safety risks associated with crashing into an unshielded buttress, snagging or spearing a barrier element, or penetrating behind/rolling over an outdated rail or barrier</li> <li>3) Improve the safety of the bridge and roadway both by installing safety appurtenances crash tested under MASH and conforming to the state-of-the-practice standards in the Roadside Design Guide, and where possible and appropriate, grading the approaching roadway and runouts into a more forgiving section.</li> </ol> <p>As all safety appurtenances to be installed on this project will replace outdated features erected near the mid-1900s with contemporary, crash-tested systems accepted by the Nebraska Department of Transportation and in accordance with the Roadside Design Guide, it is apparent by inspection that the new hardware and appurtenances will be safer for the modern vehicle fleet than are the existing appurtenances.</p> <p>As four of these five structures are located on gravel roadways and all are rural, no work to evaluate sidewalks or bike lanes to accommodate non-motorized traffic is planned as a part of this project. However, every structure except for C-253 is being widened sufficiently to accommodate a future paved shoulder that can provide for non-motorized traffic. Q-110 is on a road that has already been graded for paving and is anticipated to be paved once the corridor is annexed by the city of Lincoln. X-129 will also restore a paved link between major roadways and local campgrounds, providing a safer, more direct access for cyclists.</p>
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**Criteria #3:  
Mobility and  
Economic  
Competitiveness**

This project encompasses five structures, of which two are currently closed and another two are load posted. All three open bridges are at risk of being closed. In the event that all bridges close and are detoured along roadways of similar or better character (i.e., pavement to pavement, similar classification, etc.), LCED estimates a total additional 74.7 million vehicle miles will be traveled over the next 20 years (taking into account estimated growth and assuming the structures won't be replaced in that period). A tremendous amount of travel and the associated costs can be saved by replacing these bridges. Greater detail is provided in the benefit-cost analysis and the numbers are summarized below:

Structure	NBI ADT (vehicles and trucks)	NBI ADT Year	Growth Rate	*Bypass, Detour Length (Miles)	Total Additional Travel over 20 years (million veh-miles)
C-253	76	2017	1%	3.01	2.4
C-284	380	2017	1%	9.1	32.8
G-222	119	2017	2.5%	4.47	6.5
Q-110	140	2013	2.5%	3.99	6.9
X-129	260	2012	2%	8.1	26.1
Total Additional Travel for all structures:					<b>74.7 million Vehicle-Miles</b>

“Bypass, Detour Length” represents the total detour length less the nominal travel length, i.e., or the increased distance traveled due to detouring

As all of the bridges are closed, were recently closed, or are at risk of being closed in the future, it is apparent by inspection that in most of these situations the bridges are inadequate or nearly inadequate to safely carry any traffic load, and that replacement of each bridge would reduce the number of vehicle miles traveled and create a more resilient transportation infrastructure. Further, by providing through-travel along these corridors, vehicles that would otherwise be detoured can take a more direct path, reducing congestion on nearby corridors.

Additionally, bridge Q-110 is located within the 3-mile jurisdictional limit southeast of the City of Lincoln and is on a roadway that has been graded for pavement. The clear bridge width has been designed for an ADT greater than 2,000 VPD to accommodate future growth in this area shown as a Tier II Growth Area in the City of Lincoln Comprehensive Plan. Replacing this



	bridge is critical to provide essential growth opportunities along this corridor.
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<p><b>Criteria #4: Climate Change, Resiliency, and the Environment</b></p>	<p>By reopening two bridges and preventing the other three from being closed, this project will save more than vehicle miles per year (see Criteria #3 and the cost/benefit analysis), resulting in a commensurate reduction in emissions by eliminating detours. The emissions considerations are documented and analyzed in the attached cost/benefit analysis. Likewise, the new structures will improve the resiliency of county infrastructure in the following ways:</p> <ol style="list-style-type: none"> <li>1) The substructures will replace elements susceptible to degradation, such as timber backwalls, reducing the risk of future issues and associated maintenance, travel, and detouring</li> <li>2) The substructures will be designed and constructed to be resilient against scour, resulting in removal of two structures from the scour critical list and a third from close monitoring for scour by LCED.</li> <li>3) By replacing the aging infrastructure and restoring all assets to good repair, we will be able to resume standard, scheduled, preventative maintenance rather than performing corrective maintenance and the associated, unpredictable, and inconvenient road closures and the higher costs associated therewith.</li> </ol> <p>Additionally, the design of the press-brake tub girders (PBTG) for Q-110 provided additional freeboard and waterway area by reducing superstructure depth, improving the ability of the structure to convey floodwaters, and reducing the incidence of overtopping. Moreover, the PBTGs are lightweight and formed of a single sheet of metal, saving on the emissions associated with energy usage in the typical fabrication of welded plate girders, as well as the shipping emissions that would be required for heavier loads, from which the construction of C-253 also benefits.</p> <p>Environmental impacts were limited through iterative design on all projects, reducing the footprints of the structures and decreasing the amount of grading to be completed and right-of-way that needed to be acquired. These structures have been designed to maintain or improve connection for aquatic species. In particular, C-284's replacement with a buried box culvert limits channel impacts by providing a natural streambed throughout the structure width, and overtopping was mitigated at the 50- and 100-year recurrence interval storms.</p> <p>Additionally, Lancaster County referred to census maps to determine the extent to which the population around the structures has been historically disadvantaged, including underserved/overburdened communities, percent population older than 65, percent population disabled, percent population with limited English proficiency (LEP), percent of households with a single head of household (SHOH), percent of households with limited income (LI), and percent of households with members who are Black, Indigenous, or</p>
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People of Color (BIPOC). The findings are summarized below, and the maps are provided in the appendices.

	Underserved/ overburdened	Percent Age > 65	Percent Disabled	Percent LEP	Percent SHOH	Percent LI	Percent BIPOC
Q-110	Low	> 16%	10-15%	0-2%	5-8%	2-4%	0-8%
X-129	Low	8-12%	0-5%	0-2%	2.5-5%	0-2%	0-8%
G-222	Low	> 16%	5-10%	0-2%	0-2.5%	2-4%	0-8%
C-253	Low	12-16%	5-10%	0-2%	0-2.5%	2-4%	0-8%
C-284	Low	12-16%	5-10%	0-2%	0-2.5%	2-4%	0-8%

As shown in the table, the percent of households in a historically disadvantaged community is on the lowest or second lowest threshold for every structure excepting the categories of the elderly, the disabled, and single heads of household. Therefore, there are a limited number of households in historically disadvantaged communities adjacent to the project. Moreover, the environmental impacts felt by such communities are generally due to large right-of-way acquisitions, increased traffic, and increased activity within or nearby that community. As these are rural bridges in low population density areas, such activities are not anticipated and the communities experience greater hardship from closed bridges, which disrupt traffic. Nevertheless, in each design efforts were made to limit the footprint of each structure and the amount of required right of way, thus taking pains to limit the impacts to households and communities nearby the project areas.

**Criteria #5:  
Equity,  
Partnership,  
and Quality of  
Life**

As these structures are largely rural and construction will directly impact a minimal number of homes at each location, there will be a limited number of people to engage throughout the process; however, LCED will provide fora and equitable access to all interested parties as required in accordance with the NEPA and other processes. No current public involvement meetings are planned but this will be updated as required.

Similarly, as the bridges already exist on established corridors, the required right-of-way is minimal, as recorded below:

Structure	Tracts
Q-110	5
X-129	0 (Completed under permit from Army Corps of Engineers)
G-222	3 – Already clear
C-253	3
C-284	4

As such, the impacts to locals and their property will also be minimal, with a substantial portion of the acquisitions already completed.

As mentioned in earlier criteria, most of these structures are on gravel roads, which do not provide for pedestrian or non-motorized traffic, but all structures except for C-253 will be widened sufficiently to allow for a future paved shoulder; X-129 will reestablish a paved link to the nearby parks. Q-110 is on a corridor already graded for paving; while Lancaster County does not have any plans to include nonvehicular facilities into the structure at this time, the greater width of the structure provides an opportunity for their inclusion when the corridor is annexed and paved by the City of Lincoln.

The replacements of these structures will reestablish or maintain existing access to housing while improving both the flow of traffic along the corridor and congestion on nearby roadways that would otherwise take detoured traffic, thus improving quality of life for the traveling public as well as the neighborhoods and communities they traverse.

<p><b>Criteria #6: Innovation</b></p>	<p>The price of these structures is such that it would be impossible for Lancaster County to pursue the BIP grant individually for any structure. To that end, we are taking advantage of the benefits of bundling to create a project of sufficient size to apply for the grants while simultaneously planning to take advantage of bundled letting to both receive more competitive bids and engage larger contractors. While the structure types are varied, there is similarity in the skillsets used for erection. Q-110, G-222, and C-253 will all utilize girders, and thus will have similar construction staging and equipment requirements. X-129 will be a concrete slab bridge while C-284 will be a concrete box culvert; at first glance, these would seem to be two different structures but in the experience of Lancaster County, they utilize similar methodologies in staging, forming, falsework, and pouring, thus being great complements to each other in a bundled letting.</p> <p>Additionally, three structures are planning to utilize an innovative design to provide better outcomes:</p> <p>Both Q-110 and C-253 have been scoped as Press-Brake Tub Girders (PBTG), which are a superstructure comprised of tubs created by folding a single sheet of metal. The fabrication of the girders is therefore rapid, simple, and can be performed on blanks cut from larger sheets, providing cost savings as a result. Such fabrication also obviates the need for welds and the associated quality control, such as X-rays and other non-destructive testing. The girders themselves are easy to erect, as the tub shape provides a stable base not susceptible to roll or lateral-torsional buckling experienced by rolled or welded I-shaped girders, allowing for easy placement without laborious connections of cross frames.</p> <p>These girders also allowed for a reduction in overtopping of the roadway by reducing superstructure depth; by specifying PBTG for Q-110, the depth of the girder was reduced, and roadway raise was reduced by approximately one foot, reducing impacts to the site, lowering construction costs, and ultimately reducing the occurrence of overtopping. This resulted in the additional benefits of avoiding grade raises and associated increased substructure height, grading, and the purchase of easements while also reducing impacts to the site.</p> <p>PBTGs can be shipped with precast deck panels attached, allowing for accelerated bridge construction. While Q-110's design is nearly complete, C-253 will provide a precast design as a no-cost alternative to the cast-in-place design, allowing contractors to bid more competitively by selecting their preferred erection method.</p> <p>C-284 will take advantage of the existing channel geometry and will replace the bridge with a box culvert. Numerous contractors in the Lancaster County area have experience with constructing culverts and can thus provide a more competitive price against a bridge. As the box will not have an exposed deck, it will result in lower maintenance costs over time by avoiding milling, patching, overlays, and any other maintenance. The box also provides a</p>
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	<p>grade-control hardpoint to prevent headcut from migrating upstream in the channel, allowing for the preservation of the waterway over time. As a final benefit, the structure will be buried 1 foot below the flowline, giving a natural streambed to the floor of the barrels and reducing the environmental footprint and impact of the structure.</p>
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### Project Costs

Provide information detailing the costs associated with the project. These costs will be used to determine eligible award amount, how the project supports financial goals of the program, and other factors. More information on this section can be found in Section D.2.d.III of the NOFO.

BIP Request Amount	Exact Amount in year-of-expenditure dollars: \$ 9,915,020
Estimated Total of Other Federal funding (excluding BIP Request)	Estimate in year-of-expenditure dollars: \$0
Estimated Other Federal funding (excluding BIP) further detail	(List each Federal Program and identify Formula or Discretionary and the amount for each Federal Program, e.g. Program: n/a Amount: \$0
Estimated non- Federal funding	(Identify each source of non-Federal funding and estimated amount, e.g. Source: Local Amount: \$2,478,755
Future Eligible Project Cost (Sum of BIP request, Other Federal Funds, and non-Federal Funds, above.	Estimate in year-of-expenditure dollars: \$12,393,775
Previously incurred project costs (if applicable)	Estimate in year-of-expenditure dollars: \$686,000
Total Project Cost (Sum of 'previous incurred' and 'future eligible')	Estimate in year-of-expenditure dollars: \$13,079,775

<p>If more than one bridge, will bridge bundling be used to deliver the Project?</p>	<p>Yes, the bundling of these bridges is expected to engage more contractors, provide greater competition over bidding, and yield an overall better price. Bundling is also expected to improve the costs of the environmental studies. While LCED expects the benefits of bundling to be significant, a reliable method of estimating the value could not be determined. However, per FHWA guidance we would estimate 5% for construction and 10% for environmental review.</p>
<p>If proposed project utilizes bundling, Cost of Unbundled Projects</p>	<p>Estimate in year of expenditure dollars: \$13,039,947</p>



Amount of Future Eligible Costs by Project Type	<p>Indicate Improvement Type by Structure Number (Bridge Replacement, Bridge Rehabilitation, Bridge Preservation, Bridge Protection, or Culvert Replacement or Rehabilitation) and amount per bridge (if bundling, include the unbundled cost in brackets[\$__]<sup>1</sup>) (Ex.</p> <p style="padding-left: 40px;">Bridge Replacement Str. 001: \$20,000,000[\$25,000,000]</p> <p style="padding-left: 40px;">Bridge Replacement Str, 002, \$15,000,000[\$18,000,000]</p> <p style="padding-left: 40px;">Bridge Rehabilitation Str. 003, \$5,000,000[\$5,500,000]</p> <p>Bridge Replacement, Str 1 (C-253 C005511215) Bundled \$ 1,257,919 [Unbundled \$1,323,502]</p> <p>Bridge Replacement, Str 2 ( C-284 C005500625) Bundled \$ 1,410,836 [Unbundled \$1,484,392]</p> <p>Bridge Replacement, Str 3 (G-222 C005543520) Bundled \$ 4,339,044 [Unbundled \$4,565,268]</p> <p>Bridge Replacement Str 4 (Q-110 C005514415) Bundled \$ 3,267,992 [Unbundled \$3,438,375]</p> <p>Bridge Replacement Str 5 (X-129 C005506445) Bundled \$2,117,985 [Unbundled \$2,228,410]</p> <p>6. Will request \$0 of the amounts awarded to the entity to pay subsidy and administrative costs necessary to provide to the entity Federal credit assistance under 23 U.S.C. chapter 6.<sup>2</sup></p>
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<sup>1</sup> Costs of unbundled project will be compared with bundled costs to determine potential amount of cost savings and as a factor in the ability to unbundle bridges for an award

<sup>2</sup> Receipt of a BIP award does not guarantee that an applicant will receive TIFIA credit assistance, nor does it guarantee that any award of TIFIA credit assistance will be equal to 49% of eligible project costs. Receipt of TIFIA credit assistance is contingent on the applicant's ability to satisfy applicable creditworthiness standards and other Federal requirements.

### **Benefit-Cost Analysis**

**Benefit Cost Analysis**– Submit the requested information in Section D.2.d.V for the DOT to conduct a review of the benefit-cost analysis for the project and provide a summary of the analysis.

## **Benefit-Cost Analysis Technical Memo**

Lancaster County Engineering Department (LCED) in Nebraska is pursuing a Bridge Investment Program (BIP) grant for five Lancaster County bridges. The project includes construction of replacement structures for each of these existing bridges. The Benefit Cost Analysis (BCA) conducted for this grant application compares the costs associated with the proposed investment to the benefits of the project.

### **Description of the Scenarios**

#### Description of the Baseline

The baseline is a No-Build scenario, the status of each site:

C005511215 (C-253). This bridge is currently open, and load posted

C005500625 (C-284). This bridge is currently open

C005543520 (G-222). This bridge is currently open, and load posted

C005514415 (Q-110). Bridge currently closed

C005506445 (X-129). Bridge currently closed

Each of these bridges is rated poor and either is in the design phase or design is complete. For each of these sites it is expected that replacing the bridge will significantly reduce travel time and costs related to the detour due either to the bridge being currently closed or anticipated closing due to deteriorating conditions. As each of these bridges are rated “Poor”, the benefit cost analysis assumes no residual benefit to the existing bridge and that the bridge could be closed at any time.

#### Description of the “Build” Scenario

The BCA analyzed a Build scenario that included the replacement of each of these bridges in 2024. Environmental costs are shown in 2023 with construction and construction engineering services costs shown in 2024.

Table 1. Benefit Cost Analysis Summary of Results outlines the BCA results for each project component and the overall BCA results for the five Lancaster County Bridges project. The workbook for the BCA for this project is found in Appendix A.

## Summary of Benefit Cost Results

The overall project has a benefit cost ratio of 5.30. The largest source of benefits for the project is from travel time savings and vehicle costs due to the “bypass, detour length” when the bridge is closed. The high benefit cost ration is driven by the two bridges with the highest ADT (C005500625 (C-284) and C005506445 (X-129)) also have the longest “bypass, detour length” and among the lowest overall cost for replacement. The No-Build scenario assumes that the bridge is closed for the 20-year analysis period; if not currently closed, it is anticipated that the bridge could close at any time and therefore is shown as closed at the beginning of the analysis period.

Bridge C005543520 (G-222) has the lowest benefit cost ratio of the five bridges at 1.48. This is considered to be conservative for a number of reasons: the location is between the City of Lincoln and Waverly, its proximity to future industrial areas, and continued residential development to the north of this area. The “bypass, detour length” can also be considered conservative with industrial areas potentially located on each side of the river.

Reducing vehicle length of travel will contribute to improved air quality by reducing vehicle emissions. The monetized value of these reduced emissions is not included in this BCA, but emissions benefits would still likely be realized because of this project.

Table 1. Benefit Cost Analysis Summary of Results

Benefit Cost Summary	C00551215 (C253)	C005500625 (C284)	C005543520 (G222)	C005514415 (Q110)	C005506445 (X129)	Combined
Benefit	7% Discounted Rate	7% Discounted Rate	7% Discounted Rate	7% Discounted Rate	7% Discounted Rate	7% Discounted Rate
Passenger Vehicle Travel Time Savings	\$491,959.99	\$6,622,579.21	\$1,315,685.36	\$1,616,063.02	\$5,133,000.32	\$15,179,287.90
Truck Travel Time Savings	\$593,775.41	\$326,388.17	\$153,911.71	\$70,796.70	\$252,975.55	\$1,397,847.53
Passenger Vehicle Operating Costs	\$409,148.37	\$6,058,580.45	\$1,094,216.04	\$1,344,031.12	\$4,695,858.57	\$13,601,834.54
Truck Operating Costs	\$593,775.41	\$527,320.89	\$226,057.82	\$103,982.65	\$408,713.62	\$1,859,850.39
Residual Value	\$138,418.61	\$155,245.38	\$477,459.15	\$359,602.85	\$233,058.52	\$1,363,784.50
<b>Total Benefits</b>	<b>\$2,227,077.78</b>	<b>\$13,690,114.10</b>	<b>\$3,267,330.07</b>	<b>\$3,494,476.34</b>	<b>\$10,723,606.57</b>	<b>\$33,402,604.85</b>
Costs	7% Discounted Rate	7% Discounted Rate	7% Discounted Rate	7% Discounted Rate	7% Discounted Rate	7% Discounted Rate
Environmental Study	\$29,110.67	\$32,649.49	\$100,413.93	\$75,627.69	\$49,014.29	\$286,816.07
Construction Costs	\$544,124.69	\$610,270.86	\$1,876,895.82	\$1,413,601.74	\$916,154.95	\$5,361,048.06
Construction Engineering Costs	\$65,294.96	\$73,232.50	\$225,227.50	\$169,632.21	\$109,938.59	\$643,325.77
Operation & Maintenance Costs	\$1,012.93	\$0.00	\$9,084.06	\$2,289.99	\$3,293.06	\$15,680.05
<b>Total Costs</b>	<b>\$639,543.25</b>	<b>\$716,152.85</b>	<b>\$2,211,621.31</b>	<b>\$1,661,151.63</b>	<b>\$1,078,400.90</b>	<b>\$6,306,869.94</b>
	7% Discounted Rate	7% Discounted Rate	7% Discounted Rate	7% Discounted Rate	7% Discounted Rate	7% Discounted Rate
Benefit/Cost Ratio	3.48	19.12	1.48	2.10	9.94	5.30

## Technical Documentation of BCA Sources and Methods

The BCA conducted for the five bridges in this BIP Grant application depends on assumptions and valuation factors derived from U.S. DOT Guidance as well as from other sources including the Nebraska Department of Transportation (NDOT).

### Analysis Period

The BCA measures benefits against costs throughout a period of analysis beginning at the start of project development and including 20 years of operation. The period of analysis begins in 2023 and ends in 2044. It includes the environmental analysis for the five bridges starting in September 2023 and concluding in July 2024 (costs assigned to 2023), construction and construction services beginning in 2024 (costs assigned to 2024), and 20 years of operations (2025-2044) with maintenance costs beginning in 2025. The monetized benefits and costs are estimated in 2020 dollars with future dollars discounted at 7 percent in compliance with USDOT, Benefit-Cost Analysis Guidance for Discretionary Grant Programs, March 2022, (Revised). The analysis period of 20 years was chosen as this is a typical analysis period for new and reconstructed projects in the State of Nebraska.

### Methodology

Input prices are expressed in 2020 dollars and the basis for those dollars is explained under the paragraphs for Project Costs and Project Benefits. A constant 7-percent real discount rate is assumed throughout the period of analysis per the Benefit-Cost Analysis Guidance for Discretionary Grant Programs.

The present discounted value of the remaining service life is shown at the end of the analysis period for each bridge and is based on a 100-year service life per the Strategic Highway Research Program.

### Project Costs

*Construction Costs.* The estimated construction costs are shown in the BCA spreadsheet for each bridge (Appendix A) and the engineers estimate for each bridge is included in Appendix B. The engineer's estimate for each project was calculated using 2022 costs and the Summary of Quantities based on the current status of the design plans as noted for each bridge in the BCA spreadsheet.

Construction costs were converted to 2020 dollars (2020 \$) using an inflation rate of 7% for 2020-2021 and 15% for 2021-2022. These rates are based on the increase in construction costs seen in Lancaster County and the State of Nebraska over the last two years. A contingency of 10% of the construction costs was added for each bridge project; 10% contingency is typical for bridge construction projects in the State of Nebraska.

Costs for environmental studies, which includes the NEPA, are a percentage of the estimated construction cost as are the costs for construction services, which includes reviewing shop drawings and construction consultation as well as construction inspection. These percentages are based on typical costs for these studies and services on projects in Lancaster County. The percentage for environmental studies is 5% and the percentage for construction services is 12%.

*Operation and Maintenance Costs.* Historically, bridge-length concrete box culverts require minimal maintenance per the NDOT 2019 Transportation Asset Management Plan Report and therefore, operation and maintenance costs are not shown for bridge C005500625 (C-284).

Annual maintenance costs including cleaning drainage ways, removing gravel, controlling vegetation, and cleaning and sealing end-of-floor joints were estimated at \$0.10 per square foot of bridge deck area per a 2018 NHDOT Bridge Management Committee report on recommended funding. Using an inflation rate of 7% for construction costs, in 2020 dollars the annual maintenance costs would equal \$0.11 per square foot of bridge deck area. The annual maintenance costs are shown in Table 2. Maintenance Costs of Each Bridge.

As it is impossible to reliably predict the rate of deterioration for decks and other structural elements that may result in large repairs or to what extent new technologies can delay or prevent such repairs, we have only included the routine annual maintenance that we know we will have to perform over the 20-year analysis period. Based on the ADT and character of traffic that we expect these bridges to experience we do not expect to need to resurface the decks within the 20-year analysis period.

Table 2. Maintenance Costs of each Bridge

	Proposed Structure (sf)	Annual Maintenance Costs (\$0.11/sf, 2020 \$)
C005511215(C253)	1,139.37	\$125.33
C005500524(C284)	2,822.91	Not applicable *
C005543520(G222)	10,217.87	\$1,123.97
C005514415(Q110)	2,575.86	\$283.34

C005506445(X129)

3,704.05

\$407.45

\* No maintenance costs were calculated as this structure will be a concrete box culvert

### Project Benefits

*Value of Time.* The values for vehicle occupancy used for this analysis are those defined by the Benefit-Cost Analysis Guidance for Discretionary Grant Programs.

The per-person-hour values of time used for this analysis are those defined by the Benefit-Cost Analysis Guidance for Discretionary Grant Programs. Calculations included the speed limit of 55 mph for paved roads and 50 mph for gravel roads, the length of the detour route as described in the paragraph below labeled *Detour Length*, and 365 days/year was used to calculate the number of trips per year. The calculations for Bridge G-222 use 50 mph which is considered to be conservative; the detour is on paved roads versus gravel and does travel through the City of Waverly.

For passenger vehicles, the cost per hour associated with Personal travel was used; the note in the guidance for All Purposes travel indicated that Business travel did not include commuting. Two of the locations are in rural areas of the County and even though the other three are near urban areas, it was determined that using the cost per hour associated with Person travel would be conservative.

*Vehicle Operating Costs.* The dollars-per-mile values for vehicle operating costs used for this analysis are those defined by the Benefit-Cost Analysis Guidance for Discretionary Grant Programs. Calculations included the length of the detour route as described in the paragraph below labeled *Detour Length* and the number of trips per year was calculated using 365 days/year.

*Growth factor for ADT.* The ADT and corresponding year of the count is listed in the worksheet for each bridge in the BCA workbook under “General Information” in Appendix A. The ADT is from the FHWA NBI Bridge Inspection Data, and the year corresponds to that count in Lancaster County Engineering Department ADT data. The growth rate was applied to each vehicle count to calculate an ADT for 2022 which is shown in the “Calculations & Constants” information for each bridge. Two of the bridges are located further away from urban areas than the other three and a 1.0% growth rate was used for each year prior to 2020 and for each year post 2020 for these two bridges, C005511215 (C-253) and C005500625 (C-284).

Bridge C005543520 (G-222) is located between the City of Lincoln and the City of Waverly, within the 3-mile jurisdictional limits of Lincoln, and less than two miles from the limits of both cities. It was assigned a 2.5% growth rate for all years of analysis. According to the City of Lincoln Long Range Transportation Plan (LRTP), industrial growth is expected to occur in the area adjacent to this corridor which has a National Functional Classification of Minor Collector. The LRTP also shows household growth to the north of this location. Minor collectors provide service to smaller places, linking local roads with the arterial system. This growth rate is considered to be conservative. The City of Lincoln LRTP maps are included in Appendix – of the grant application.

Bridge C005514415 (Q-110) is located just east of the City of Lincoln and within the 3-mile jurisdictional limit of the City of Lincoln. It was assigned a 2.5% growth rate for all years of analysis due to its proximity to the City of Lincoln and that the roadway has been graded for paving; this growth rate is considered to be conservative.

Bridge C005506445 (X-129) is adjacent to a recreation area and within 1.6 miles of the limits of the City of Hickman, Nebraska. The Hickman Strategic Plan 2018 adopted September 25, 2018, used a 2.5 % growth rate for the City of Hickman; due to its proximity to the City of Hickman and the recreation area, this bridge was assigned a growth rate of 2.0% for all years of analysis. This bridge is located on a Major Collector.

*Detour Length.* The “Bypass, Detour Length” in the FHWA NBI Bridge Inspection data was not considered to be conservative and therefore, detour lengths were determined by Lancaster County Engineering Department (LCED) by routing traffic to roadways of similar or better character (i.e., pavement to pavement, similar classification, etc); the revised detour length is listed in the worksheet for each bridge under General Notes. The calculated value of “Bypass, Detour Length in hours” and “Bypass, Detour Length in miles” used the revised detour length less the length of the non-closed route.

*Truck Traffic.* Data on truck traffic was only available for bridge C005514415 (Q-110) on FHWA’s NBI bridge inventory data site. Data on truck traffic (ADTT) has recently become an option on the traffic counts conducted by Lancaster County; traffic counts that include the ADTT have not yet been conducted at the other four bridge locations primarily due to the bridges being closed. An analysis of countywide traffic counts indicates that generally 2% to 5 % of all traffic is truck traffic.

An analysis of recent traffic counts that include the ADTT around Bridge C005543520 (G-222) and between the Cities of Lincoln and Waverly revealed truck traffic percentages ranging from 3% to 20% of the ADT. We chose to use 9% for this analysis



and subtracted the percent of truck traffic from the vehicle ADT for the passenger vehicle calculations. According to the City of Lincoln Long Range Transportation Plan (LRTP), industrial growth is expected to occur in the area adjacent to this bridge. This roadway has a National Functional Classification of Minor Collector. This area between the Cities of Lincoln and Waverly is currently home to the City of Lincoln Landfill and the Lincoln Electric System (LES) Generation Station.

Bridge C005506255 (C-284) is near a recent traffic count that showed 4% of vehicles counted were truck traffic and therefore, 4% was used for this location and the percentage of truck traffic was subtracted from the vehicle ADT for the passenger vehicle calculations. This bridge is located on a Major Collector as is Bridge C005506445 (X-129) and therefore, 4% truck traffic was also used for this location.

A truck percentage of 2% was used for Bridge C005511215 (C-253) to be conservative. This is the lowest percentage that has been noted in countywide traffic counts.

*Environmental Sustainability.* Reducing vehicle length of travel will contribute to improved air quality by reducing vehicle emissions. The monetized value of these reduced emissions is not included in this BCA, but emissions benefits would still likely be realized because of this project.

*Residual Benefits* The present discounted value of the remaining service life is shown at the end of the analysis period for each bridge and is based on a 100-year service life per Strategic Highway Research Program.

*Bundling.* The bundling of these bridges is expected to engage more contractors, provide greater competition over bidding, and yield an overall better price. Bundling is also expected to improve the costs of the environmental studies. While LCED expects the benefits of bundling to be significant, a reliable method of estimating the value could not be determined and it was not factored into the Benefit-Cost analysis.

*Assumptions.* The assumptions used in the estimation of economic benefits for the project are summarized in Table 3. Cost Parameter Inputs for Closure Related Costs, 2020 \$.

Table 3. Cost Parameter Inputs for Closure Related Costs, 2020 \$

Benefit Categories	Variable Name	Unit	Value	Source/Notes
Travel Time Savings	Vehicle Average Occupancy (Passenger - All Travel)	Persons per vehicle	\$ 1.67	USDOT, Benefit-Cost Analysis Guidance for Discretionary Grant Programs, March 2022 (Revised)
	Vehicle Average Occupancy (Truck)	Persons per vehicle	\$ 1.00	
	Value of Time - Passenger Vehicle - Personal	Dollars per hour	\$ 16.20	USDOT, Benefit-Cost Analysis Guidance for Discretionary Grant Programs, March 2022 (Revised)
	Value of Time - Truck	Dollars per hour	\$ 32.00	
Vehicle Operating Costs	Vehicle Operating Costs - Passenger Vehicle	Dollars per mile	\$ 0.45	USDOT, Benefit-Cost Analysis Guidance for Discretionary Grant Programs, March 2022 (Revised)
	Vehicle Operating Costs - Truck	Dollars per mile	\$ 0.94	

### Summary of Findings and BCA Outcomes

This project will replace five bridges in the inventory of Lancaster County Engineering Department in Nebraska that are rated poor and range in age from 52 to 82 years. Three of these bridges are within two miles of a city's limit, and two of these three are on a roadway classified as a Collector. The overall benefit cost ratio is 5.30; the true benefit to the citizens of Lancaster County cannot be quantified.

### Project Readiness and Environmental Risk

**Project Readiness and Environmental Risk** – Submit the requested information in Section E.2.b.iii for the DOT to conduct a review of the project readiness and environmental risk criteria for the project and provide a summary. If project includes multiple bridges, indicate the information for each bridge included in the application and what impact would occur on the timeframes if the project were unbundled.

<p>Other Federal Funding and Non-Federal Funding Secured</p>	<p>Yes</p> <p>Project estimated at \$12,393,775 *</p> <p>Local funds secured for (20%) \$2,478,755</p> <p>*Construction Funds estimated using FY2025 as construction start date</p>
<p>NEPA Status – Indicate if the determination will likely be the result of a Categorical Exclusion (CE), Environmental Assessment (EA), or Environmental Impact Statement (EIS)</p>	<p>Planned or Actual Start of NEPA Date: September 5, 2023</p> <p>Planned or Actual Completion of NEPA Date: July 12, 2024</p> <p>Final NEPA Determination or current status of NEPA process: determination likely the result of a Categorical Exclusion (CE)</p>
<p>Is the project currently programmed in the:</p> <ul style="list-style-type: none"> <li>• TIP</li> <li>• STIP</li> <li>• MPO Long Range Transportation Plan</li> <li>• State Long Range Transportation Plan</li> </ul>	<p>Yes</p> <p>All 5 bridges are in the MPO Long Range Transportation Plan</p> <p>Q-110 is in the Fiscally Constrained Rural Road &amp; Bridge Capital Project (Project ID 215)</p> <p>The other 4 (C-253 (Project ID 233), C-284 (Project ID 230), G-222 (Project ID 225), and X-129 (Project ID 226)) are in the Illustrative Plan (Unfunded) Rural Road &amp; Bridge Capital Project</p>
<p>Is right-of-way acquisition necessary?</p>	<p>Yes, obtained following the Uniform Act</p> <p>If Yes, Planned or Actual Start of Right-of-Way Acquisition Date: 12/9/2021</p> <p>Planned or Actual Completion of Right-of-Way Acquisition Date: 2/15/2023</p>
<p>Right-of way acquisition considerations.</p>	<p>If right-of-way must be acquired for the project:</p> <ol style="list-style-type: none"> <li>1. Would right-of-way acquisition require relocation of any people or businesses? No</li> <li>2. If yes, are people or businesses being relocated members of traditionally underserved and underrepresented populations (Environmental Justice communities)? If yes, please describe.</li> </ol>

Design Status	<p>The design status is different for each bridge:</p> <p>C253: prelim start/completed of Apr22/Jun22, final start/completed of Jun22/Oct22</p> <p>C284: prelim start/completed of Apr22/Jul22, final start/completed of Jul22/Nov22</p> <p>G222: prelim start/completed of Aug20/Oct20, final start/completed of Oct20/May21</p> <p>Q110: prelim start/completed of Mar21/Jul21, final start/completed of Aug21/May22</p> <p>X129: prelim start/completed of Nov20/Feb21, final start/completed of Feb21/Apr21</p>
Anticipated Construction Start Date:	Date: April 2025
Anticipated Project Completion Date:	Date: July 2026
<p>The summary on project readiness and environmental risk demonstrates...</p> <p>The preliminary environmental reviews indicate that all projects will likely be Categorical Exclusions under NEPA; the environmental risk factors are low, and Corps of Engineers Nationwide Permit Verifications have been received for three of the five projects. It is anticipated that Corps of Engineers permits will be received for the other two projects by December 2022. Each of the bridge locations are currently programmed in the LRTP. All projects are currently in design or have design complete, with a substantial portion of all rights-of-way already acquired. All projects will be shovel-ready by February 2023.</p>	

### Project Priority Considerations

**Project Priority Considerations:** Does the application support any of the DOT Priority Considerations – Bridge Projects listed in Section E.2.b of the NOFO? If the applications supports one or more of the considerations for the FY22 submissions, describe which consideration(s) is supports and how. In the discussion below, reference to previous sections in which additional information was detailed to support the consideration(s).

This application supports the following priority considerations by...

As all structures in this application are currently in poor condition, they all satisfy the first priority consideration criterion of being poor or in danger of falling into poor condition within the next five years. All structures are currently undergoing design and preliminary environmental reviews indicate a likely Categorical Exclusion through NEPA, and thus all structures satisfy the priority consideration criterion of being able to advance to final design within 12 months of NEPA completion. In the event that they are elevated from a CatEx to a higher class, all appropriate alternatives will be evaluated, and design will be repeated as required. Finally, as all of these structures do not currently have complete funding identified for their construction, they all satisfy the priority consideration criterion of construction not commencing before September 30, 2025, without a BIP Grant.

This information is further developed in the Project Description.

## Budget Narrative File(s)

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\* **Mandatory Budget Narrative Filename:**

[Add Mandatory Budget Narrative](#)

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To add more Budget Narrative attachments, please use the attachment buttons below.

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# Benefit-Cost Analysis Technical Memo

Lancaster County Engineering Department (LCED) in Nebraska is pursuing a Bridge Investment Program (BIP) grant for five Lancaster County bridges. The project includes construction of replacement structures for each of these existing bridges. The Benefit Cost Analysis (BCA) conducted for this grant application compares the costs associated with the proposed investment to the benefits of the project.

## Description of the Scenarios

### Description of the Baseline

The baseline is a No-Build scenario, the status of each site:

C005511215 (C-253). This bridge is currently open, and load posted

C005500625 (C-284). This bridge is currently open

C005543520 (G-222). This bridge is currently open, and load posted

C005514415 (Q-110). Bridge currently closed

C005506445 (X-129). Bridge currently closed

Each of these bridges is rated poor and either is in the design phase or design is complete. For each of these sites it is expected that replacing the bridge will significantly reduce travel time and costs related to the detour due either to the bridge being currently closed or anticipated closing due to deteriorating conditions. As each of these bridges are rated "Poor", the benefit cost analysis assumes no residual benefit to the existing bridge and that the bridge could be closed at any time.

### Description of the "Build" Scenario

The BCA analyzed a Build scenario that included the replacement of each of these bridges in 2024. Environmental costs are shown in 2023 with construction and construction engineering services costs shown in 2024.

Table 1. Benefit Cost Analysis Summary of Results outlines the BCA results for each project component and the overall BCA results for the five Lancaster County Bridges project. The workbook for the BCA for this project is found in Appendix A.

## Summary of Benefit Cost Results

The overall project has a benefit cost ratio of 5.30. The largest source of benefits for the project is from travel time savings and vehicle costs due to the "bypass, detour length" when the bridge is closed. The high benefit cost ration is driven by the two bridges with the highest ADT (C005500625 (C-284) and C005506445 (X-129)) also have the longest "bypass, detour length" and among the lowest overall cost for replacement. The No-Build scenario assumes that the bridge is closed for the 20-year analysis period; if not currently closed, it is anticipated that the bridge could close at any time and therefore is shown as closed at the beginning of the analysis period.

Table 1. Benefit Cost Analysis Summary of Results

Benefit Cost Summary	C005511215 (C253)	C005500625 (C284)	C005543520 (G222)	C005514415 (Q110)	C005506445 (X129)	Combined
<b>Benefit</b>	<b>7% Discounted Rate</b>	<b>7% Discounted Rate</b>	<b>7% Discounted Rate</b>	<b>7% Discounted Rate</b>	<b>7% Discounted Rate</b>	<b>7% Discounted Rate</b>
Passenger Vehicle Travel Time Savings	\$491,959.99	\$6,622,579.21	\$1,315,685.36	\$1,616,063.02	\$5,133,000.32	\$15,179,287.90
Truck Travel Time Savings	\$593,775.41	\$326,388.17	\$153,911.71	\$70,796.70	\$252,975.55	\$1,397,847.53
Passenger Vehicle Operating Costs	\$409,148.37	\$6,058,580.45	\$1,094,216.04	\$1,344,031.12	\$4,695,858.57	\$13,601,834.54
Truck Operating Costs	\$593,775.41	\$527,320.89	\$226,057.82	\$103,982.65	\$408,713.62	\$1,859,850.39
Residual Value	\$138,418.61	\$155,245.38	\$477,459.15	\$359,602.85	\$233,058.52	\$1,363,784.50
<b>Total Benefits</b>	<b>\$2,227,077.78</b>	<b>\$13,690,114.10</b>	<b>\$3,267,330.07</b>	<b>\$3,494,476.34</b>	<b>\$10,723,606.57</b>	<b>\$33,402,604.85</b>
<b>Costs</b>	<b>7% Discounted Rate</b>	<b>7% Discounted Rate</b>	<b>7% Discounted Rate</b>	<b>7% Discounted Rate</b>	<b>7% Discounted Rate</b>	<b>7% Discounted Rate</b>
Environmental Study	\$29,110.67	\$32,649.49	\$100,413.93	\$75,627.69	\$49,014.29	\$286,816.07
Construction Costs	\$544,124.69	\$610,270.86	\$1,876,895.82	\$1,413,601.74	\$916,154.95	\$5,361,048.06
Construction Engineering Costs	\$65,294.96	\$73,232.50	\$225,227.50	\$169,632.21	\$109,938.59	\$643,325.77
Operation & Maintenance Costs	\$1,012.93	\$0.00	\$9,084.06	\$2,289.99	\$3,293.06	\$15,680.05
<b>Total Costs</b>	<b>\$639,543.25</b>	<b>\$716,152.85</b>	<b>\$2,211,621.31</b>	<b>\$1,661,151.63</b>	<b>\$1,078,400.90</b>	<b>\$6,306,869.94</b>
	<b>7% Discounted Rate</b>	<b>7% Discounted Rate</b>	<b>7% Discounted Rate</b>	<b>7% Discounted Rate</b>	<b>7% Discounted Rate</b>	<b>7% Discounted Rate</b>
Benefit/Cost Ratio	3.48	19.12	1.48	2.10	9.94	5.30



Bridge C005543520 (G-222) has the lowest benefit cost ratio of the five bridges at 1.48. This is considered to be conservative for a number of reasons: the location is between the City of Lincoln and Waverly, its proximity to future industrial areas, and continued residential development to the north of this area. The “bypass, detour length” can also be considered conservative with industrial areas potentially located on each side of the river.

Reducing vehicle length of travel will contribute to improved air quality by reducing vehicle emissions. The monetized value of these reduced emissions is not included in this BCA, but emissions benefits would still likely be realized because of this project.

### **Technical Documentation of BCA Sources and Methods**

The BCA conducted for the five bridges in this BIP Grant application depends on assumptions and valuation factors derived from U.S. DOT Guidance as well as from other sources including the Nebraska Department of Transportation (NDOT).

#### Analysis Period

The BCA measures benefits against costs throughout a period of analysis beginning at the start of project development and including 20 years of operation. The period of analysis begins in 2023 and ends in 2044. It includes the environmental analysis for the five bridges starting in September 2023 and concluding in July 2024 (costs assigned to 2023), construction and construction services beginning in 2024 (costs assigned to 2024), and 20 years of operations (2025-2044) with maintenance costs beginning in 2025. The monetized benefits and costs are estimated in 2020 dollars with future dollars discounted at 7 percent in compliance with USDOT, Benefit-Cost Analysis Guidance for Discretionary Grant Programs, March 2022, (Revised). The analysis period of 20 years was chosen as this is a typical analysis period for new and reconstructed projects in the State of Nebraska.

#### Methodology

Input prices are expressed in 2020 dollars and the basis for those dollars is explained under the paragraphs for Project Costs and Project Benefits. A constant 7-percent real discount rate is assumed throughout the period of analysis per the Benefit-Cost Analysis Guidance for Discretionary Grant Programs.

The present discounted value of the remaining service life is shown at the end of the analysis period for each bridge and is based on a 100-year service life per the Strategic Highway Research Program.

#### Project Costs

*Construction Costs.* The estimated construction costs are shown in the BCA spreadsheet for each bridge (Appendix A) and the engineers estimate for each bridge is included in Appendix B. The engineer’s estimate for each project was calculated using 2022 costs and the Summary of Quantities based on the current status of the design plans as noted for each bridge in the BCA spreadsheet.

Construction costs were converted to 2020 dollars (2020 \$) using an inflation rate of 7% for 2020-2021 and 15% for 2021-2022. These rates are based on the increase in construction costs seen in Lancaster County and the State of Nebraska over the last two years. A contingency of 10% of the construction

costs was added for each bridge project; 10% contingency is typical for bridge construction projects in the State of Nebraska.

Costs for environmental studies, which includes the NEPA, are a percentage of the estimated construction cost as are the costs for construction services, which includes reviewing shop drawings and construction consultation as well as construction inspection. These percentages are based on typical costs for these studies and services on projects in Lancaster County. The percentage for environmental studies is 5% and the percentage for construction services is 12%.

*Operation and Maintenance Costs.* Historically, bridge-length concrete box culverts require minimal maintenance per the NDOT 2019 Transportation Asset Management Plan Report and therefore, operation and maintenance costs are not shown for bridge C005500625 (C-284).

Annual maintenance costs including cleaning drainage ways, removing gravel, controlling vegetation, and cleaning and sealing end-of-floor joints were estimated at \$0.10 per square foot of bridge deck area per a 2018 NHDOT Bridge Management Committee report on recommended funding. Using an inflation rate of 7% for construction costs, in 2020 dollars the annual maintenance costs would equal \$0.11 per square foot of bridge deck area. The annual maintenance costs are shown in Table 2. Maintenance Costs of Each Bridge.

As it is impossible to reliably predict the rate of deterioration for decks and other structural elements that may result in large repairs or to what extent new technologies can delay or prevent such repairs, we have only included the routine annual maintenance that we know we will have to perform over the 20-year analysis period. Based on the ADT and character of traffic that we expect these bridges to experience we do not expect to need to resurface the decks within the 20-year analysis period.

Table 2. Maintenance Costs of Each Bridge

	Proposed Structure (sf)	Annual Maintenance Costs (\$0.11/sf, 2020 \$)
C005511215(C253)	1,139.37	\$125.33
C005500524(C284)	2,822.91	Not applicable *
C005543520(G222)	10,217.87	\$1,123.97
C005514415(Q110)	2,575.86	\$283.34
C005506445(X129)	3,704.05	\$407.45

\* No annual maintenance costs were calculated as this structure will be a concrete box culvert

Project Benefits

*Value of Time.* The values for vehicle occupancy used for this analysis are those defined by the Benefit-Cost Analysis Guidance for Discretionary Grant Programs.

The per-person-hour values of time used for this analysis are those defined by the Benefit-Cost Analysis Guidance for Discretionary Grant Programs. Calculations included the speed limit of 55 mph for paved

roads and 50 mph for gravel roads, the length of the detour route as described in the paragraph below labeled *Detour Length*, and 365 days/year was used to calculate the number of trips per year. The calculations for Bridge G-222 use 50 mph which is considered to be conservative; the detour is on paved roads versus gravel and does travel through the City of Waverly.

For passenger vehicles, the cost per hour associated with Personal travel was used; the note in the guidance for All Purposes travel indicated that Business travel did not include commuting. Two of the locations are in rural areas of the County and even though the other three are near urban areas, it was determined that using the cost per hour associated with Person travel would be conservative.

*Vehicle Operating Costs.* The dollars-per-mile values for vehicle operating costs used for this analysis are those defined by the Benefit-Cost Analysis Guidance for Discretionary Grant Programs. Calculations included the length of the detour route as described in the paragraph below labeled *Detour Length* and the number of trips per year was calculated using 365 days/year.

*Growth factor for ADT.* The ADT and corresponding year of the count is listed in the worksheet for each bridge in the BCA workbook under “General Information” in Appendix A. The ADT is from the FHWA NBI Bridge Inspection Data, and the year corresponds to that count in Lancaster County Engineering Department ADT data. The growth rate was applied to each vehicle count to calculate an ADT for 2022 which is shown in the “Calculations & Constants” information for each bridge. Two of the bridges are located further away from urban areas than the other three and a 1.0% growth rate was used for each year prior to 2020 and for each year post 2020 for these two bridges, C005511215 (C-253) and C005500625 (C-284).

Bridge C005543520 (G-222) is located between the City of Lincoln and the City of Waverly, within the 3-mile jurisdictional limits of Lincoln, and less than two miles from the limits of both cities. It was assigned a 2.5% growth rate for all years of analysis. According to the City of Lincoln Long Range Transportation Plan (LRTP), industrial growth is expected to occur in the area adjacent to this corridor which has a National Functional Classification of Minor Collector. The LRTP also shows household growth to the north of this location. Minor collectors provide service to smaller places, linking local roads with the arterial system. This growth rate is considered to be conservative. The City of Lincoln LRTP maps are included [in Appendix – of the grant application](#).

Bridge C005514415 (Q-110) is located just east of the City of Lincoln and within the 3-mile jurisdictional limit of the City of Lincoln. It was assigned a 2.5% growth rate for all years of analysis due to its proximity to the City of Lincoln and that the roadway has been graded for paving; this growth rate is considered to be conservative.

Bridge C005506445 (X-129) is adjacent to a recreation area and within 1.6 miles of the limits of the City of Hickman, Nebraska. The Hickman Strategic Plan 2018 adopted September 25, 2018, used a 2.5 % growth rate for the City of Hickman; due to its proximity to the City of Hickman and the recreation area, this bridge was assigned a growth rate of 2.0% for all years of analysis. This bridge is located on a Major Collector.

*Detour Length.* The “Bypass, Detour Length” in the FHWA NBI Bridge Inspection data was not considered to be conservative and therefore, detour lengths were determined by Lancaster County Engineering Department (LCED) by routing traffic to roadways of similar or better character (i.e., pavement to pavement, similar classification, etc); the revised detour length is listed in the worksheet for each bridge

under General Notes. The calculated value of “Bypass, Detour Length in hours” and “Bypass, Detour Length in miles” used the revised detour length less the length of the non-closed route.

*Truck Traffic.* Data on truck traffic was only available for bridge C005514415 (Q-110) on FHWA’s NBI bridge inventory data site. Data on truck traffic (ADTT) has recently become an option on the traffic counts conducted by Lancaster County; traffic counts that include the ADTT have not yet been conducted at the other four bridge locations primarily due to the bridges being closed. An analysis of countywide traffic counts indicates that generally 2% to 5 % of all traffic is truck traffic.

An analysis of recent traffic counts that include the ADTT around Bridge C005543520 (G-222) and between the Cities of Lincoln and Waverly revealed truck traffic percentages ranging from 3% to 20% of the ADT. We chose to use 9% for this analysis and subtracted the percent of truck traffic from the vehicle ADT for the passenger vehicle calculations. According to the City of Lincoln Long Range Transportation Plan (LRTP), industrial growth is expected to occur in the area adjacent to this bridge. This roadway has a National Functional Classification of Minor Collector. This area between the Cities of Lincoln and Waverly is currently home to the City of Lincoln Landfill and the Lincoln Electric System (LES) Generation Station.

Bridge C005506255 (C-284) is near a recent traffic count that showed 4% of vehicles counted were truck traffic and therefore, 4% was used for this location and the percentage of truck traffic was subtracted from the vehicle ADT for the passenger vehicle calculations. This bridge is located on a Major Collector as is Bridge C005506445 (X-129) and therefore, 4% truck traffic was also used for this location.

A truck percentage of 2% was used for Bridge C005511215 (C-253) to be conservative. This is the lowest percentage that has been noted in countywide traffic counts.

*Environmental Sustainability.* Reducing vehicle length of travel will contribute to improved air quality by reducing vehicle emissions. The monetized value of these reduced emissions is not included in this BCA, but emissions benefits would still likely be realized because of this project.

*Residual Benefits* The present discounted value of the remaining service life is shown at the end of the analysis period for each bridge and is based on a 100-year service life per Strategic Highway Research Program.

*Bundling.* The bundling of these bridges is expected to engage more contractors, provide greater competition over bidding, and yield an overall better price. Bundling is also expected to improve the costs of the environmental studies. While LCED expects the benefits of bundling to be significant, a reliable method of estimating the value could not be determined and it was not factored into the Benefit-Cost analysis.

*Assumptions.* The assumptions used in the estimation of economic benefits for the project are summarized in Table 3. Cost Parameter Inputs for Closure Related Costs, 2020 \$.

Table 3. Cost Parameter Inputs for Closure Related Costs, 2020 \$

Benefit Categories	Variable Name	Unit	Value	Source/Notes
Travel Time Savings	Vehicle Average Occupancy (Passenger - All Travel)	Persons per vehicle	\$ 1.67	USDOT, Benefit-Cost Analysis Guidance for Discretionary Grant Programs, March 2022 (Revised)
	Vehicle Average Occupancy (Truck)	Persons per vehicle	\$ 1.00	
	Value of Time - Passenger Vehicle - Personal	Dollars per hour	\$ 16.20	USDOT, Benefit-Cost Analysis Guidance for Discretionary Grant Programs, March 2022 (Revised)
	Value of Time - Truck	Dollars per hour	\$ 32.00	
Vehicle Operating Costs	Vehicle Operating Costs - Passenger Vehicle	Dollars per mile	\$ 0.45	USDOT, Benefit-Cost Analysis Guidance for Discretionary Grant Programs, March 2022 (Revised)
	Vehicle Operating Costs - Truck	Dollars per mile	\$ 0.94	

### Summary of Findings and BCA Outcomes

This project will replace five bridges in the inventory of Lancaster County Engineering Department in Nebraska that are rated poor and range in age from 52 to 82 years. Three of these bridges are within two miles of a city's limit, and two of these three are on a roadway classified as a Collector. The overall benefit cost ratio is 5.30; the true benefit to the citizens of Lancaster County cannot be quantified.

**The following attachment is not included in the view since it is not a read-only PDF file.**

**Upon submission, this file will be transmitted to the Grantor without any data loss.**

**AppendixB\_BCAdocumentation\_BIP2022.pdf**

**Benefit Cost Analysis**  
**Summary of 5 Bridges in Lancaster County**  
**BIP**

Benefit Cost Summary	C005511215 (C253)	C005500625 (C284)	C005543520 (G222)	C005514415 (Q110)	C005506445 (X129)	Combined
Benefit	7% Discounted Rate	7% Discounted Rate	7% Discounted Rate	7% Discounted Rate	7% Discounted Rate	7% Discounted Rate
Passenger Vehicle Travel Time Savings	\$491,959.99	\$6,622,579.21	\$1,315,685.36	\$1,616,063.02	\$5,133,000.32	\$15,179,287.90
Truck Travel Time Savings	\$593,775.41	\$326,388.17	\$153,911.71	\$70,796.70	\$252,975.55	\$1,397,847.53
Passenger Vehicle Operating Costs	\$409,148.37	\$6,058,580.45	\$1,094,216.04	\$1,344,031.12	\$4,695,858.57	\$13,601,834.54
Truck Operating Costs	\$593,775.41	\$527,320.89	\$226,057.82	\$103,982.65	\$408,713.62	\$1,859,850.39
Residual Value	\$138,418.61	\$155,245.38	\$477,459.15	\$359,602.85	\$233,058.52	\$1,363,784.50
<b>Total Benefits</b>	\$2,227,077.78	\$13,690,114.10	\$3,267,330.07	\$3,494,476.34	\$10,723,606.57	\$33,402,604.85
Costs	7% Discounted Rate	7% Discounted Rate	7% Discounted Rate	7% Discounted Rate	7% Discounted Rate	7% Discounted Rate
Environmental Study	\$29,110.67	\$32,649.49	\$100,413.93	\$75,627.69	\$49,014.29	\$286,816.07
Construction Costs	\$544,124.69	\$610,270.86	\$1,876,895.82	\$1,413,601.74	\$916,154.95	\$5,361,048.06
Construction Engineering Costs	\$65,294.96	\$73,232.50	\$225,227.50	\$169,632.21	\$109,938.59	\$643,325.77
Operation & Maintenance Costs	\$1,012.93	\$0.00	\$9,084.06	\$2,289.99	\$3,293.06	\$15,680.05
<b>Total Costs</b>	\$639,543.25	\$716,152.85	\$2,211,621.31	\$1,661,151.63	\$1,078,400.90	\$6,306,869.94
	7% Discounted Rate	7% Discounted Rate	7% Discounted Rate	7% Discounted Rate	7% Discounted Rate	7% Discounted Rate
Benefit/Cost Ratio	3.48	19.12	1.48	2.10	9.94	5.30

**Benefit Cost Analysis**  
**CO05511215 (C253)**  
**BIP**

General Information:		
Facility Location	Rural	
Facility Status	Open	
Bridge Posting	Posted required	
Road Surface	Gravel	
Speed Limit	50	mph
ADT - Vehicles (2017) *	76	Veh/Day
ADT - Truck (2017) *	0	Veh/Day
Useful Service Life	100	Years
Bypass, Detour Length **	30	Kilometers

General Notes (see Benefit Cost Analysis Technical Memo for further explanation):	
* ADT count from FHWA NBI Bridge Inspection Data; used 1.0% for growth rate	
** Bypass, Detour Length listed in FHWA NBI Bridge Inspection Data	
*** Costs for Maintenance (annual maintenance costs shown)	
**** Truck Traffic was estimated to be 2% of the total ADT	
***** Bypass, Detour Length calculated by LCEd is 4.01 miles less 1.0 mile nominal travel length; i.e., the increased distance traveled due to detouring	
This bridge is listed as closed in FHWA NBI Bridge Inspection Data, it is open after closure for a repair	

Costs based on 30% Plans:				
	2022 \$	w/Contingency	2020 \$	
Construction	\$797,852.25	\$877,637.48	\$713,236.47	Dollars
Maintenance	\$0.00	\$0.00	\$125.33	Dollar/Year
Environmental Studies	\$39,892.61	\$43,881.87	\$35,661.82	Dollars
Construction Engineering	\$95,742.27	\$105,316.50	\$85,588.38	Dollars

Summary of Relevant Data, Quantifiable Benefits and Costs																					
Calendar Year	Project Year	ADT Passenger Vehicle (1.0% growth)	ADT Truck (1.0% growth)	Vehicle Number of Trips/Year	Truck Number of Trips/Year	Passenger Vehicle VTTS	Discounted Vehicle Travel Time Savings at 7%	Truck VTTS	Discounted Truck Travel Time Savings at 7%	Passenger Vehicle Operating Costs	Discounted Passenger Vehicle Operating Costs at 7%	Truck Operating Costs	Discounted Truck Operating Costs at 7%	Residual Value	Discounted Residual Value at 7%	Construction Costs (2020 \$)	Discounted Construction Costs at 7%	Operation & Maintenance Costs (2020 \$)	Discounted Operation & Maintenance Costs at 7%	Additional Travel/Year (Veh-miles)	
2023	1	79	2	28858	589	\$46,999.01	\$38,365.20	\$56,725.87	\$46,905.21	\$39,087.67	\$31,907.18	\$56,725.87	\$46,305.21	\$0.00	\$0.00	\$35,661.82	\$29,110.67	\$0.00	\$0.00	88,634	
2024	2	80	2	29146	595	\$47,469.00	\$36,213.88	\$57,293.13	\$43,708.65	\$39,478.55	\$30,117.99	\$57,293.13	\$43,708.65	\$0.00	\$0.00	\$798,824.85	\$609,419.65	\$0.00	\$0.00	89,521	
2025	3	81	2	29438	601	\$47,943.69	\$34,183.19	\$57,866.06	\$41,257.70	\$39,873.33	\$28,429.13	\$57,866.06	\$41,257.70	\$0.00	\$0.00	\$0.00	\$0.00	\$125.33	\$89.36	90,416	
2026	4	81	2	29732	607	\$48,423.13	\$32,266.38	\$58,444.72	\$38,944.19	\$40,272.07	\$26,834.98	\$58,444.72	\$38,944.19	\$0.00	\$0.00	\$0.00	\$0.00	\$125.33	\$83.51	91,320	
2027	5	82	2	30029	613	\$48,907.36	\$30,457.05	\$59,029.17	\$36,760.40	\$40,674.79	\$25,330.21	\$59,029.17	\$36,760.40	\$0.00	\$0.00	\$0.00	\$0.00	\$125.33	\$78.05	92,233	
2028	6	83	2	30330	619	\$49,396.44	\$28,749.18	\$59,619.46	\$34,699.07	\$41,081.53	\$23,909.83	\$59,619.46	\$34,699.07	\$0.00	\$0.00	\$0.00	\$0.00	\$125.33	\$72.94	93,155	
2029	7	84	2	30633	625	\$49,890.40	\$27,137.07	\$60,215.65	\$32,753.33	\$41,492.35	\$22,569.09	\$60,215.65	\$32,753.33	\$0.00	\$0.00	\$0.00	\$0.00	\$125.33	\$68.17	94,087	
2030	8	85	2	30939	631	\$50,389.31	\$25,615.37	\$60,817.81	\$30,916.69	\$41,907.27	\$21,303.53	\$60,817.81	\$30,916.69	\$0.00	\$0.00	\$0.00	\$0.00	\$125.33	\$63.71	95,028	
2031	9	86	2	31249	638	\$50,893.20	\$24,178.99	\$61,425.99	\$29,183.04	\$42,326.35	\$20,108.94	\$61,425.99	\$29,183.04	\$0.00	\$0.00	\$0.00	\$0.00	\$125.33	\$59.54	95,978	
2032	10	86	2	31561	644	\$51,402.13	\$22,823.16	\$62,040.25	\$27,546.61	\$42,749.61	\$18,981.34	\$62,040.25	\$27,546.61	\$0.00	\$0.00	\$0.00	\$0.00	\$125.33	\$55.65	96,938	
2033	11	87	2	31877	651	\$51,916.15	\$21,543.36	\$62,660.65	\$26,001.94	\$43,177.11	\$17,916.96	\$62,660.65	\$26,001.94	\$0.00	\$0.00	\$0.00	\$0.00	\$125.33	\$52.01	97,907	
2034	12	88	2	32196	657	\$52,435.31	\$20,335.32	\$63,287.26	\$24,543.89	\$43,608.88	\$16,912.27	\$63,287.26	\$24,543.89	\$0.00	\$0.00	\$0.00	\$0.00	\$125.33	\$48.61	98,886	
2035	13	89	2	32518	664	\$52,959.67	\$19,195.02	\$63,920.13	\$23,167.60	\$44,044.97	\$15,963.92	\$63,920.13	\$23,167.60	\$0.00	\$0.00	\$0.00	\$0.00	\$125.33	\$45.43	99,875	
2036	14	90	2	32843	670	\$53,489.26	\$18,118.66	\$64,559.33	\$21,868.48	\$44,485.41	\$15,068.75	\$64,559.33	\$21,868.48	\$0.00	\$0.00	\$0.00	\$0.00	\$125.33	\$42.45	100,874	
2037	15	91	2	33171	677	\$54,024.16	\$17,102.66	\$65,204.93	\$20,642.21	\$44,930.27	\$14,223.77	\$65,204.93	\$20,642.21	\$0.00	\$0.00	\$0.00	\$0.00	\$125.33	\$39.68	101,883	
2038	16	92	2	33503	684	\$54,564.40	\$16,143.64	\$65,856.97	\$19,484.70	\$45,379.57	\$13,426.18	\$65,856.97	\$19,484.70	\$0.00	\$0.00	\$0.00	\$0.00	\$125.33	\$37.08	102,901	
2039	17	93	2	33838	691	\$55,110.04	\$15,238.39	\$66,515.54	\$18,392.10	\$45,833.37	\$12,673.31	\$66,515.54	\$18,392.10	\$0.00	\$0.00	\$0.00	\$0.00	\$125.33	\$34.65	103,931	
2040	18	94	2	34176	697	\$55,661.14	\$14,383.90	\$67,180.70	\$17,360.77	\$46,291.70	\$11,962.66	\$67,180.70	\$17,360.77	\$0.00	\$0.00	\$0.00	\$0.00	\$125.33	\$32.39	104,970	
2041	19	95	2	34518	704	\$56,217.75	\$13,577.32	\$67,852.51	\$16,387.27	\$46,754.62	\$11,291.85	\$67,852.51	\$16,387.27	\$0.00	\$0.00	\$0.00	\$0.00	\$125.33	\$30.27	106,020	
2042	20	96	2	34863	711	\$56,779.93	\$12,815.98	\$68,531.03	\$15,468.36	\$47,222.16	\$10,658.66	\$68,531.03	\$15,468.36	\$0.00	\$0.00	\$0.00	\$0.00	\$125.33	\$28.29	107,080	
2043	21	96	2	35212	719	\$57,347.73	\$12,097.32	\$69,216.34	\$14,600.97	\$47,694.39	\$10,060.98	\$69,216.34	\$14,600.97	\$0.00	\$0.00	\$0.00	\$0.00	\$125.33	\$26.44	108,151	
2044	22	97	2	35564	726	\$57,921.21	\$11,418.97	\$69,908.51	\$13,782.23	\$48,171.33	\$9,496.81	\$69,908.51	\$13,782.23	\$702,109.98	\$138,418.61	\$0.00	\$0.00	\$125.33	\$24.71	109,232	
					Σ		\$491,959.99		\$593,775.41		\$409,148.37		\$593,775.41		\$138,418.61		\$638,530.32		\$1,012.93	2,169,019	

Calculations & Constants		
ADT - Vehicles (2022)	80	
ADT - Trucks (2022) ****	2	
Bypass, Detour Length in hours *****	0.06	
Bypass, Detour Length in miles *****	3.01	
Vehicle Average Occupancy (Automobiles)	1.67	persons
Vehicle Average Occupancy (Trucks)	1.00	persons
Value of Time (Automobiles) - Personal (2020 \$)	\$ 16.20	hour
Value of Time (Trucks) - (2020 \$)	\$ 32.00	hour
Vehicle Operating Costs - Passenger Vehicles (2020 \$)	\$ 0.45	mile
Vehicle Operating Costs - Commercial Vehicle (2020 \$)	\$ 0.94	mile
Benefits Total	\$2,227,077.78	
Costs Total	\$639,543.25	
<b>B/C</b>	<b>3.48</b>	



**Benefit Cost Analysis**  
C005500625 (C284)  
BIP

General Information:	
Facility Location	Rural
Facility Status	Open
Bridge Posting	No posting required
Road Surface	Paved
Speed Limit	55 mph
ADT - Vehicles (2017) *	380 Veh/Day
ADT - Truck (2017) *	0 Veh/Day
Service Life:	100 Years
Bypass, Detour Length **	30 Kilometers

General Notes (see Benefit Cost Analysis Technical Memo for further explanation):	
* ADT count from FHWA NBI Bridge Inspection data; used 1.0% growth rate	
** Bypass, Detour Length listed in FHWA Bridge Data	
*** Costs for Maintenance (annual maintenance costs not shown - the proposed replacement is a concrete box culvert)	
**** Truck Traffic was estimated to be 4% of the total ADT	
***** Bypass, Detour Length calculated by LCED is 10.1 miles less 1.0 mile for non-detour length; i.e., the increased distance traveled due to detouring	

Costs Based on 30% Plans:			
	2022 \$	w/Contingency	2020 \$
Construction	\$894,842.65	\$984,326.92	\$799,940.61
Maintenance ***	\$0.00	\$0.00	\$0.00
Environmental Studies	\$44,742.13	\$49,216.35	\$39,997.03
Construction Engineering	\$107,381.12	\$118,119.23	\$95,992.87

Summary of Relevant Data, Quantifiable Benefits and Costs																						
Calendar Year	Project Year	ADT Passenger Vehicle (1.0% growth)	ADT Truck (1.0% growth)	Vehicle Number of Trips/Year	Truck Number of Trips/Year	Passenger Vehicle VTTS	Discounted Vehicle Travel Time Savings at 7%	Truck VTTS	Discounted Truck Travel Time Savings at 7%	Passenger Vehicle Operating Costs	Discounted Passenger Vehicle Operating Costs at 7%	Truck Operating Costs	Discounted Truck Operating Costs at 7%	Residual Value	Discounted Residual Value at 7%	Construction Costs (2020 \$)	Discounted Construction Costs at 7%	Operation & Maintenance Costs (2020 \$)	Discounted Operation & Maintenance Costs at 7%	Additional Travel/Year (Veh-miles)		
2023	1	387	16	141344	5889	\$632,682.94	\$516,457.74	\$31,181.24	\$25,453.18	\$578,801.76	\$472,474.65	\$50,377.19	\$41,122.79	\$0.00	\$0.00	\$39,997.03	\$32,649.49	\$0.00	\$0.00	1,339,819		
2024	2	391	16	142757	5948	\$639,009.77	\$487,497.49	\$31,493.05	\$24,025.90	\$584,589.78	\$445,980.74	\$50,880.96	\$38,816.84	\$0.00	\$0.00	\$89,933.48	\$683,503.36	\$0.00	\$0.00	1,353,217		
2025	3	395	16	144185	6008	\$645,399.87	\$460,161.19	\$31,807.98	\$22,678.65	\$590,435.68	\$420,972.48	\$51,389.77	\$36,640.20	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	1,366,749		
2026	4	399	17	145626	6068	\$651,853.87	\$434,357.76	\$32,126.06	\$21,406.95	\$596,340.03	\$397,366.54	\$51,903.67	\$34,585.61	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	1,380,417		
2027	5	403	17	147083	6128	\$658,372.41	\$410,001.25	\$32,447.32	\$20,206.56	\$602,303.43	\$375,084.31	\$52,422.71	\$32,646.23	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	1,394,221		
2028	6	407	17	148553	6190	\$664,956.13	\$387,010.52	\$32,771.80	\$19,073.48	\$608,326.47	\$354,051.54	\$52,946.93	\$30,815.60	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	1,408,163		
2029	7	411	17	150039	6252	\$671,605.69	\$365,309.00	\$33,099.51	\$18,003.94	\$614,409.73	\$334,198.18	\$53,476.40	\$29,087.62	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	1,422,245		
2030	8	415	17	151539	6314	\$678,321.75	\$344,824.38	\$33,430.51	\$16,994.38	\$620,553.83	\$315,458.10	\$54,011.17	\$27,456.54	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	1,436,467		
2031	9	419	17	153055	6377	\$685,104.97	\$325,488.43	\$33,764.81	\$16,041.42	\$626,759.37	\$297,768.86	\$54,551.28	\$25,916.92	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	1,450,832		
2032	10	424	18	154585	6441	\$691,956.02	\$307,236.75	\$34,102.46	\$15,141.90	\$633,026.96	\$281,071.54	\$55,096.79	\$24,463.63	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	1,465,340		
2033	11	428	18	156131	6505	\$698,875.58	\$290,008.52	\$34,443.49	\$14,292.82	\$639,357.23	\$265,310.52	\$55,647.76	\$23,091.84	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	1,479,994		
2034	12	432	18	157693	6571	\$705,864.33	\$273,746.36	\$34,787.92	\$13,491.36	\$645,750.80	\$250,433.29	\$56,204.24	\$21,796.97	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	1,494,741		
2035	13	436	18	159269	6636	\$712,922.97	\$258,396.09	\$35,135.80	\$12,734.83	\$652,208.31	\$236,390.31	\$56,766.28	\$20,574.71	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	1,509,741		
2036	14	441	18	160862	6703	\$720,052.20	\$243,906.59	\$35,487.16	\$12,020.73	\$658,730.39	\$223,134.77	\$57,333.94	\$19,420.99	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	1,524,839		
2037	15	445	19	162471	6770	\$727,229.59	\$230,229.59	\$35,842.03	\$11,346.67	\$665,317.70	\$210,622.54	\$57,907.28	\$18,331.96	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	1,540,087		
2038	16	450	19	164095	6837	\$734,525.25	\$217,319.52	\$36,200.45	\$10,710.41	\$671,970.87	\$198,811.93	\$58,486.35	\$17,304.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	1,555,488		
2039	17	454	19	165736	6906	\$741,870.51	\$205,133.38	\$36,562.46	\$10,109.82	\$678,690.58	\$187,663.60	\$59,071.22	\$16,333.68	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	1,571,043		
2040	18	459	19	167394	6975	\$749,289.21	\$193,630.57	\$36,928.08	\$9,542.92	\$685,477.49	\$177,140.41	\$59,661.93	\$15,417.78	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	1,586,753		
2041	19	463	19	169068	7044	\$756,782.10	\$182,772.78	\$37,297.36	\$9,007.80	\$692,332.26	\$167,207.30	\$60,258.55	\$14,553.23	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	1,602,621		
2042	20	468	19	170758	7115	\$764,349.92	\$172,523.84	\$37,670.33	\$8,502.69	\$699,255.59	\$157,831.19	\$60,861.13	\$13,737.16	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	1,618,647		
2043	21	473	20	172466	7186	\$771,993.42	\$162,849.61	\$38,047.04	\$8,025.90	\$706,248.14	\$148,980.84	\$61,469.75	\$12,966.85	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	1,634,834		
2044	22	477	20	174191	7258	\$779,713.36	\$153,717.85	\$38,427.51	\$7,575.85	\$713,310.62	\$140,626.78	\$62,084.44	\$12,239.74	\$787,461.53	\$155,245.38	\$0.00	\$0.00	\$0.00	\$0.00	1,651,182		
2045	23																					
							\$6,622,579.21		\$326,388.17		\$6,058,580.45		\$527,320.89		\$155,245.38		\$716,152.85		\$0.00		32,787,493	

Calculations & Constants	
ADT - Vehicles (2022)	399
ADT - Trucks (2022) ****	16
Bypass, Detour Length in hours *****	0.17 hours
Bypass, Detour Length in miles *****	9.10 miles
Vehicle Average Occupancy (Automobiles)	1.67 persons
Vehicle Average Occupancy (Trucks)	1.00 persons
Value of Time (Automobiles) - Personal (2020 \$)	\$ 16.20 hour
Value of Time (Trucks) -(2020 \$)	\$ 32.00 hour
Vehicle Operating Costs - Passenger Vehicles (2020 \$)	\$ 0.45 mile
Vehicle Operating Costs - Commercial Vehicle (2020 \$)	\$ 0.94 mile
Benefits Total	\$13,690,114.10
Costs Total	\$716,152.85
<b>B/C</b>	<b>19.12</b>

**Benefit Cost Analysis  
C00543520 (G222)  
BIP**

General Information:		
Facility Location	Rural	
Facility Status	Open	
Bridge Posting	Posting required	
Road Surface	Gravel	
Speed Limit	50	mph
ADT - Vehicles (2017) *	119	Veh/Day
ADT - Truck (2017) *	0	Veh/Day
Service Life:	100	Years
Bypass, Detour Length **	30	Kilometers

General Notes (see Benefit Cost Analysis Technical Memo for further explanation):
* ADT count from FHWA NBI Bridge Inspection data; used 2.5% for growth rate
** Bypass, Detour Length listed in FHWA Bridge Data
*** Costs for Maintenance (annual maintenance costs shown)
**** Truck Traffic was estimated to be 9% of the total ADT
***** Bypass, Detour Length calculated by LCEd is 7.44 miles less 2.97 miles for non-detour length; i.e., the increased distance traveled due to detouring

Costs Based on Final Plans				
	2022 \$	w/Contingency	2020 \$	
Construction	\$2,752,100.00	\$3,027,310.00	\$2,460,227.55	Dollars
Maintenance ***	\$0.00	\$0.00	\$1,123.97	Dollar/Year
Environmental Studies	\$137,605.00	\$151,365.50	\$123,011.38	Dollars
Construction Engineering	\$330,252.00	\$363,277.20	\$295,227.31	Dollars

Summary of Relevant Data, Quantifiable Benefits and Costs																				
Calendar Year	Project Year	ADT Passenger Vehicle (2.5% growth)	ADT Truck (2.5% growth)	Vehicle Number of Trips/Year	Truck Number of Trips/Year	Passenger Vehicle VTTS	Discounted Vehicle Travel Time Savings at 7%	Truck VTTS	Discounted Truck Travel Time Savings at 7%	Passenger Vehicle Operating Costs	Discounted Passenger Vehicle Operating Costs at 7%	Truck Operating Costs	Discounted Truck Operating Costs at 7%	Residual Value	Discounted Residual Value at 7%	Construction Costs (2020 \$)	Discounted Construction Costs at 7%	Operation & Maintenance Costs (2020 \$)	Discounted Operation & Maintenance Costs at 7%	Additional Travel/Year (Veh-miles)
2023	1	126	12	45838	4533	\$110,864.73	\$90,498.65	\$12,969.20	\$10,586.73	\$92,202.87	\$75,265.01	\$19,048.51	\$15,549.25	\$0.00	\$0.00	\$123,011.38	\$100,413.93	\$0.00	\$0.00	225,160
2024	2	129	13	46984	4647	\$113,636.35	\$86,692.63	\$13,293.43	\$10,141.49	\$94,507.94	\$72,099.66	\$19,524.72	\$14,895.31	\$0.00	\$0.00	\$2,755,454.86	\$2,102,123.32	\$0.00	\$0.00	230,789
2025	3	132	13	48158	4763	\$116,477.26	\$83,046.68	\$13,625.76	\$9,714.98	\$96,870.64	\$69,067.43	\$20,012.84	\$14,268.88	\$0.00	\$0.00	\$0.00	\$0.00	\$1,123.97	\$801.38	236,558
2026	4	135	13	49362	4882	\$119,389.19	\$79,554.06	\$13,966.40	\$9,306.41	\$99,292.41	\$66,162.72	\$20,513.16	\$13,668.78	\$0.00	\$0.00	\$0.00	\$0.00	\$1,123.97	\$748.95	242,472
2027	5	139	14	50596	5004	\$122,373.92	\$76,208.33	\$14,315.56	\$8,915.01	\$101,774.72	\$63,380.18	\$21,025.99	\$13,093.93	\$0.00	\$0.00	\$0.00	\$0.00	\$1,123.97	\$699.95	248,534
2028	6	142	14	51861	5129	\$125,433.27	\$73,003.30	\$14,673.45	\$8,540.08	\$104,319.09	\$60,714.66	\$21,551.64	\$12,543.25	\$0.00	\$0.00	\$0.00	\$0.00	\$1,123.97	\$654.16	254,747
2029	7	146	14	53158	5257	\$128,569.10	\$69,933.07	\$15,040.29	\$8,180.92	\$106,927.06	\$58,161.24	\$22,090.43	\$12,015.73	\$0.00	\$0.00	\$0.00	\$0.00	\$1,123.97	\$611.37	261,116
2030	8	149	15	54487	5389	\$131,783.33	\$66,991.96	\$15,416.30	\$7,836.86	\$109,600.24	\$55,715.20	\$22,642.69	\$11,510.39	\$0.00	\$0.00	\$0.00	\$0.00	\$1,123.97	\$571.37	267,644
2031	9	153	15	55849	5524	\$135,073.91	\$64,174.54	\$15,801.70	\$7,507.28	\$112,340.25	\$53,372.04	\$23,208.75	\$11,026.31	\$0.00	\$0.00	\$0.00	\$0.00	\$1,123.97	\$533.99	274,335
2032	10	157	16	57245	5662	\$138,454.86	\$61,475.61	\$16,196.75	\$7,191.55	\$115,148.75	\$51,127.42	\$23,788.97	\$10,562.59	\$0.00	\$0.00	\$0.00	\$0.00	\$1,123.97	\$499.06	281,194
2033	11	161	16	58676	5803	\$141,916.23	\$58,890.19	\$16,601.67	\$6,889.10	\$118,027.47	\$48,977.20	\$24,383.70	\$10,118.37	\$0.00	\$0.00	\$0.00	\$0.00	\$1,123.97	\$466.41	288,223
2034	12	165	16	60143	5948	\$145,464.14	\$56,413.50	\$17,016.71	\$6,599.37	\$120,978.16	\$46,917.42	\$24,993.29	\$9,692.83	\$0.00	\$0.00	\$0.00	\$0.00	\$1,123.97	\$435.89	295,429
2035	13	169	17	61647	6097	\$149,100.74	\$54,040.97	\$17,442.13	\$6,321.83	\$124,002.61	\$44,944.25	\$25,618.12	\$9,285.19	\$0.00	\$0.00	\$0.00	\$0.00	\$1,123.97	\$407.38	302,815
2036	14	173	17	63188	6249	\$152,828.26	\$51,768.22	\$17,878.18	\$6,055.96	\$127,102.68	\$43,054.07	\$26,258.58	\$8,894.69	\$0.00	\$0.00	\$0.00	\$0.00	\$1,123.97	\$380.73	310,385
2037	15	177	18	64768	6406	\$156,648.97	\$49,591.05	\$18,325.13	\$5,801.27	\$130,280.24	\$41,243.39	\$26,915.04	\$8,520.61	\$0.00	\$0.00	\$0.00	\$0.00	\$1,123.97	\$355.82	318,145
2038	16	182	18	66387	6566	\$160,565.19	\$47,505.45	\$18,783.26	\$5,557.29	\$133,537.25	\$39,508.85	\$27,587.52	\$8,162.27	\$0.00	\$0.00	\$0.00	\$0.00	\$1,123.97	\$332.54	326,098
2039	17	186	18	68047	6730	\$164,579.32	\$45,507.55	\$19,252.84	\$5,323.57	\$136,875.68	\$37,847.27	\$28,277.61	\$7,819.00	\$0.00	\$0.00	\$0.00	\$0.00	\$1,123.97	\$310.79	334,251
2040	18	191	19	69748	6898	\$168,693.80	\$43,593.68	\$19,734.16	\$5,099.68	\$140,297.57	\$36,255.56	\$28,984.55	\$7,490.16	\$0.00	\$0.00	\$0.00	\$0.00	\$1,123.97	\$290.46	342,607
2041	19	196	19	71491	7071	\$172,911.15	\$41,760.30	\$20,227.52	\$4,885.21	\$143,805.01	\$34,730.79	\$29,709.17	\$7,175.15	\$0.00	\$0.00	\$0.00	\$0.00	\$1,123.97	\$271.45	351,172
2042	20	201	20	73279	7247	\$177,233.93	\$40,004.03	\$20,733.21	\$4,679.76	\$147,400.14	\$33,270.15	\$30,451.90	\$6,873.39	\$0.00	\$0.00	\$0.00	\$0.00	\$1,123.97	\$253.69	359,951
2043	21	206	20	75111	7429	\$181,664.77	\$38,321.62	\$21,251.54	\$4,482.95	\$151,085.14	\$31,870.94	\$31,213.19	\$6,584.33	\$0.00	\$0.00	\$0.00	\$0.00	\$1,123.97	\$237.10	368,950
2044	22	211	21	76988	7614	\$186,206.39	\$36,709.96	\$21,782.82	\$4,294.41	\$154,862.27	\$30,530.57	\$31,993.52	\$6,307.42	\$2,421,848.00	\$477,459.15	\$0.00	\$0.00	\$1,123.97	\$221.59	378,174
2045	23																			
							Σ	1,315,685.36	153,911.71	1,094,216.04	1,094,216.04	226,057.82	226,057.82		477,459.15		2,202,537.24		\$9,084.06	6,498,750

Calculations & Constants	
ADT - Vehicles (2022)	135
ADT - Trucks (2022) ****	12
Bypass, Detour Length in hours *****	0.09 hours
Bypass, Detour Length in miles *****	4.47 miles
Vehicle Average Occupancy (Automobiles)	1.67 persons
Vehicle Average Occupancy (Trucks)	1.00 persons
Value of Time (Automobiles) - Personal (2020 \$)	\$ 16.20 hour
Value of Time (Trucks) - (2020 \$)	\$ 32.00 hour
Vehicle Operating Costs - Passenger Vehicles (2020 \$)	\$ 0.45 mile
Vehicle Operating Costs - Commercial Vehicle (2020 \$)	\$ 0.94 mile
Benefits Total	\$ 3,267,330.07
Costs Total	\$ 2,211,621.31
<b>B/C</b>	<b>1.48</b>



**Benefit Cost Analysis  
C005506445 (X129)  
BIP**

General Information:	
Facility Location	Rural
Facility Status	Closed
Bridge Posting	No posting required
Road Surface	Paved
Speed Limit	55 mph
ADT - Vehicles (2012) *	260 Veh/Day
ADT - Truck (2012) *	0 Veh/Day
Service Life:	100 Years
Bypass, Detour Length **	30 Kilometers

**General Notes (see Benefit Cost Analysis Technical Memo for further explanation):**

- \* ADT count from FHWA NBI Bridge Inspection data; used 2.0% for growth rate
- \*\* Bypass, Detour Length listed in FHWA Bridge Data
- \*\*\* Costs for Maintenance (annual maintenance costs shown)
- \*\*\*\* Truck traffic was estimated to be 4% of the total ADT
- \*\*\*\*\* Detour Length calculated by LCD is 10.1 miles less 2.0 mile for non-detour length; i.e., the increased distance traveled due to detouring

Costs based on Final Plans:			
	2022 \$	w/Contingency	2020 \$
Construction	\$1,343,361.75	\$1,477,697.93	\$1,200,892.26
Maintenance	\$0.00	\$0.00	\$407.45
Environmental Studies	\$67,168.09	\$73,884.90	\$60,044.61
Construction Engineering	\$161,203.41	\$177,323.75	\$144,107.07

**Summary of Relevant Data, Quantifiable Benefits and Costs**

Calendar Year	Project Year	ADT Passenger Vehicle (2.0% growth)	ADT Truck*** (2.0% growth)	Vehicle Number of Trips/Year	Truck Number of Trips/Year	Passenger Vehicle VYTS	Discounted Vehicle Travel Time Savings at 7%	Truck VYTS	Discounted Truck Travel Time Savings at 7%	Passenger Vehicle Operating Costs	Discounted Passenger Vehicle Operating Costs at 7%	Truck Operating Costs	Discounted Truck Operating Costs at 7%	Residual Value	Discounted Residual Value at 7%	Construction Costs (2020 \$)	Discounted Construction Costs at 7%	Operation & Maintenance Costs (2020 \$)	Discounted Operation & Maintenance Costs at 7%	Additional Travel/Year	
2023	1	310	13	113276	4720	\$451,328.91	\$368,418.83	\$22,243.36	\$18,157.21	\$412,892.38	\$337,043.17	\$35,936.93	\$29,335.24	\$0.00	\$0.00	\$60,044.61	\$49,014.29	\$0.00	\$0.00	955,769	
2024	2	317	13	11542	4814	\$460,355.48	\$351,203.00	\$22,688.23	\$17,308.74	\$421,150.23	\$321,293.49	\$36,655.67	\$27,964.43	\$0.00	\$0.00	\$1,344,999.33	\$1,026,093.55	\$0.00	\$0.00	974,885	
2025	3	323	13	117853	4911	\$469,562.59	\$334,791.64	\$23,141.99	\$16,499.92	\$429,573.23	\$306,279.78	\$37,388.78	\$26,657.68	\$0.00	\$0.00	\$0.00	\$0.00	\$407.45	\$290.51	994,382	
2026	4	329	14	120210	5009	\$478,953.83	\$319,147.17	\$23,604.83	\$15,728.90	\$438,164.70	\$291,967.64	\$38,136.56	\$25,412.00	\$0.00	\$0.00	\$0.00	\$0.00	\$407.45	\$271.50	1,014,270	
2027	5	336	14	122614	5109	\$488,532.92	\$304,233.75	\$24,076.93	\$14,993.90	\$446,927.99	\$278,224.29	\$38,899.29	\$24,224.52	\$0.00	\$0.00	\$0.00	\$0.00	\$407.45	\$253.74	1,034,556	
2028	6	343	14	125066	5211	\$498,303.58	\$290,017.22	\$24,558.47	\$14,293.25	\$455,866.55	\$265,318.48	\$39,677.27	\$23,092.53	\$0.00	\$0.00	\$0.00	\$0.00	\$407.45	\$237.14	1,055,247	
2029	7	350	15	127568	5315	\$508,269.65	\$276,465.01	\$25,049.64	\$13,625.34	\$464,983.88	\$252,920.42	\$40,470.82	\$22,013.44	\$0.00	\$0.00	\$0.00	\$0.00	\$407.45	\$221.63	1,076,352	
2030	8	356	15	130119	5422	\$518,435.05	\$263,546.09	\$25,550.63	\$12,988.64	\$474,283.56	\$241,101.71	\$41,280.24	\$20,984.78	\$0.00	\$0.00	\$0.00	\$0.00	\$407.45	\$207.13	1,097,879	
2031	9	364	15	132721	5530	\$528,803.75	\$251,230.85	\$26,061.64	\$12,381.70	\$483,769.23	\$229,835.28	\$42,105.84	\$20,004.18	\$0.00	\$0.00	\$0.00	\$0.00	\$407.45	\$193.58	1,119,836	
2032	10	371	15	135376	5641	\$539,379.82	\$239,491.09	\$26,582.87	\$11,803.11	\$493,444.61	\$219,095.31	\$42,947.96	\$19,069.41	\$0.00	\$0.00	\$0.00	\$0.00	\$407.45	\$180.91	1,142,233	
2033	11	378	16	138083	5753	\$550,167.42	\$228,299.92	\$27,114.53	\$11,251.57	\$503,313.51	\$208,857.21	\$43,806.92	\$18,178.31	\$0.00	\$0.00	\$0.00	\$0.00	\$407.45	\$169.08	1,165,078	
2034	12	386	16	140845	5869	\$561,170.77	\$217,631.70	\$27,656.82	\$10,725.79	\$513,379.78	\$199,097.53	\$44,683.05	\$17,328.86	\$0.00	\$0.00	\$0.00	\$0.00	\$407.45	\$158.02	1,188,379	
2035	13	394	16	143662	5986	\$572,394.18	\$207,461.99	\$28,209.96	\$10,224.59	\$523,647.37	\$189,793.91	\$45,576.72	\$16,519.10	\$0.00	\$0.00	\$0.00	\$0.00	\$407.45	\$147.68	1,212,147	
2036	14	401	17	146535	6106	\$583,842.07	\$197,767.51	\$28,774.16	\$9,746.80	\$534,120.32	\$180,925.03	\$46,488.25	\$15,747.18	\$0.00	\$0.00	\$0.00	\$0.00	\$407.45	\$138.02	1,236,390	
2037	15	409	17	149466	6228	\$595,518.91	\$188,526.04	\$29,349.64	\$9,291.34	\$544,802.73	\$172,470.59	\$47,418.02	\$15,011.33	\$0.00	\$0.00	\$0.00	\$0.00	\$407.45	\$128.99	1,261,117	
2038	16	418	17	152455	6352	\$607,429.29	\$179,716.41	\$29,936.63	\$8,857.17	\$555,698.78	\$164,411.22	\$48,366.38	\$14,309.87	\$0.00	\$0.00	\$0.00	\$0.00	\$407.45	\$120.55	1,286,340	
2039	17	426	18	155504	6479	\$619,577.87	\$171,318.44	\$30,535.37	\$8,443.28	\$566,812.76	\$156,728.45	\$49,333.70	\$13,641.18	\$0.00	\$0.00	\$0.00	\$0.00	\$407.45	\$112.66	1,312,067	
2040	18	435	18	158614	6609	\$631,969.43	\$163,312.91	\$31,146.07	\$8,048.74	\$578,149.01	\$149,404.69	\$50,320.38	\$13,003.74	\$0.00	\$0.00	\$0.00	\$0.00	\$407.45	\$105.29	1,338,308	
2041	19	443	18	161787	6741	\$644,608.82	\$155,681.47	\$31,769.00	\$7,672.63	\$589,711.99	\$142,423.16	\$51,326.78	\$12,396.09	\$0.00	\$0.00	\$0.00	\$0.00	\$407.45	\$98.40	1,365,074	
2042	20	452	19	165022	6876	\$657,500.99	\$148,406.63	\$32,404.38	\$7,314.09	\$601,506.23	\$135,767.88	\$52,353.32	\$11,816.83	\$0.00	\$0.00	\$0.00	\$0.00	\$407.45	\$91.97	1,392,376	
2043	21	461	19	168323	7013	\$670,651.01	\$141,471.74	\$33,052.46	\$6,972.31	\$613,536.36	\$129,423.58	\$53,400.39	\$11,264.65	\$0.00	\$0.00	\$0.00	\$0.00	\$407.45	\$85.95	1,420,223	
2044	22	470	20	171689	7154	\$684,064.03	\$134,860.91	\$33,713.51	\$6,646.51	\$625,807.08	\$123,375.75	\$54,468.39	\$10,738.26	\$1,182,158.34	\$233,058.52	\$0.00	\$0.00	\$407.45	\$80.33	1,448,628	
2045	23																				
							\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
							5,133,000.32		252,975.55		4,695,858.57		408,713.62		233,058.52		1,075,107.84		3,293.06		26,091.533

Calculations & Constants	
ADT - Vehicles (2022)	317
ADT - Trucks (2022) ***	13
Bypass, Detour Length in hours *****	0.15 hours
Bypass, Detour Length in miles *****	8.10 miles
Vehicle Average Occupancy (Automobiles)	1.67 persons
Vehicle Average Occupancy (Trucks)	1.00 persons
Value of Time (Automobiles) - Personal (2020 \$)	\$ 16.20 hour
Value of Time (Trucks) (2020 \$)	\$ 32.00 hour
Vehicle Operating Costs - Passenger Vehicles (2020 \$)	\$ 0.45 mile
Vehicle Operating Costs - Commercial Vehicle (2020 \$)	\$ 0.94 mile
Benefits Total	\$ 10,723,606.57
Costs Total	\$ 1,078,400.90
<b>B/C</b>	<b>9.94</b>

**BUDGET INFORMATION - Construction Programs**

*NOTE: Certain Federal assistance programs require additional computations to arrive at the Federal share of project costs eligible for participation. If such is the case, you will be notified.*

COST CLASSIFICATION	a. Total Cost	b. Costs Not Allowable for Participation	c. Total Allowable Costs (Columns a-b)
1. Administrative and legal expenses	\$ <input type="text" value="0.00"/>	\$ <input type="text" value="0.00"/>	\$ <input type="text" value="0.00"/>
2. Land, structures, rights-of-way, appraisals, etc.	\$ <input type="text" value="50,000.00"/>	\$ <input type="text" value="50,000.00"/>	\$ <input type="text" value="0.00"/>
3. Relocation expenses and payments	\$ <input type="text" value="0.00"/>	\$ <input type="text" value="0.00"/>	\$ <input type="text" value="0.00"/>
4. Architectural and engineering fees	\$ <input type="text" value="686,000.00"/>	\$ <input type="text" value="686,000.00"/>	\$ <input type="text" value="0.00"/>
5. Other architectural and engineering fees	\$ <input type="text" value="0.00"/>	\$ <input type="text" value="0.00"/>	\$ <input type="text" value="0.00"/>
6. Project inspection fees	\$ <input type="text" value="1,155,597.00"/>	\$ <input type="text" value="231,119.00"/>	\$ <input type="text" value="924,478.00"/>
7. Site work	\$ <input type="text" value="0.00"/>	\$ <input type="text" value="0.00"/>	\$ <input type="text" value="0.00"/>
8. Demolition and removal	\$ <input type="text" value="0.00"/>	\$ <input type="text" value="0.00"/>	\$ <input type="text" value="0.00"/>
9. Construction	\$ <input type="text" value="9,629,973.00"/>	\$ <input type="text" value="1,925,995.00"/>	\$ <input type="text" value="7,703,978.00"/>
10. Equipment	\$ <input type="text" value="0.00"/>	\$ <input type="text" value="0.00"/>	\$ <input type="text" value="0.00"/>
11. Miscellaneous	\$ <input type="text" value="481,499.00"/>	\$ <input type="text" value="96,300.00"/>	\$ <input type="text" value="385,199.00"/>
12. SUBTOTAL (sum of lines 1-11)	\$ <input type="text" value="12,003,069.00"/>	\$ <input type="text" value="2,989,414.00"/>	\$ <input type="text" value="9,013,655.00"/>
13. Contingencies	\$ <input type="text" value="1,126,707.00"/>	\$ <input type="text" value="225,341.00"/>	\$ <input type="text" value="901,366.00"/>
14. SUBTOTAL	\$ <input type="text" value="13,129,776.00"/>	\$ <input type="text" value="3,214,755.00"/>	\$ <input type="text" value="9,915,021.00"/>
15. Project (program) income	\$ <input type="text" value="0.00"/>	\$ <input type="text" value=""/>	\$ <input type="text" value="0.00"/>
16. TOTAL PROJECT COSTS (subtract #15 from #14)	\$ <input type="text" value="13,129,776.00"/>	\$ <input type="text" value="3,214,755.00"/>	\$ <input type="text" value="9,915,021.00"/>
<b>FEDERAL FUNDING</b>			
17. Federal assistance requested, calculate as follows: (Consult Federal agency for Federal percentage share.) Enter eligible costs from line 16c Multiply X <input type="text" value=""/> % Enter the resulting Federal share.			\$ <input type="text" value="0.00"/>

## ASSURANCES - CONSTRUCTION PROGRAMS

OMB Number: 4040-0009  
Expiration Date: 02/28/2025

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0042), Washington, DC 20503.

**PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.**

**NOTE:** Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the Awarding Agency. Further, certain Federal assistance awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant, I certify that the applicant:

1. Has the legal authority to apply for Federal assistance, and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project costs) to ensure proper planning, management and completion of project described in this application.
2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, the right to examine all records, books, papers, or documents related to the assistance; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.
3. Will not dispose of, modify the use of, or change the terms of the real property title or other interest in the site and facilities without permission and instructions from the awarding agency. Will record the Federal awarding agency directives and will include a covenant in the title of real property acquired in whole or in part with Federal assistance funds to assure non-discrimination during the useful life of the project.
4. Will comply with the requirements of the assistance awarding agency with regard to the drafting, review and approval of construction plans and specifications.
5. Will provide and maintain competent and adequate engineering supervision at the construction site to ensure that the complete work conforms with the approved plans and specifications and will furnish progressive reports and such other information as may be required by the assistance awarding agency or State.
6. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.
7. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.
8. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§4728-4763) relating to prescribed standards of merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).
9. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.
10. Will comply with all Federal statutes relating to non-discrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§1681 1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C. §§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee 3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.

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Prescribed by OMB Circular A-102

11. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal and federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.
12. Will comply with the provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.
13. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C. §874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333) regarding labor standards for federally-assisted construction subagreements.
14. Will comply with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is \$10,000 or more.
15. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).
16. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.
17. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a-1 et seq).
18. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."
19. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.
20. Will comply with the requirements of Section 106(g) of the Trafficking Victims Protection Act (TVPA) of 2000, as amended (22 U.S.C. 7104) which prohibits grant award recipients or a sub-recipient from (1) Engaging in severe forms of trafficking in persons during the period of time that the award is in effect (2) Procuring a commercial sex act during the period of time that the award is in effect or (3) Using forced labor in the performance of the award or subawards under the award.

<b>SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL</b> <input type="text" value="Completed on submission to Grants.gov"/>	<b>TITLE</b> <input type="text" value="Grant Coordinator"/>
<b>APPLICANT ORGANIZATION</b> <input type="text" value="Lancaster County, Nebraska"/>	<b>DATE SUBMITTED</b> <input type="text" value="Completed on submission to Grants.gov"/>

SF-424D (Rev. 7-97) Back

# ATTACHMENTS FORM

**Instructions:** On this form, you will attach the various files that make up your grant application. Please consult with the appropriate Agency Guidelines for more information about each needed file. Please remember that any files you attach must be in the document format and named as specified in the Guidelines.

**Important:** Please attach your files in the proper sequence. See the appropriate Agency Guidelines for details.

1) Please attach Attachment 1	<input type="text"/>	Add Attachment	Delete Attachment	View Attachment
2) Please attach Attachment 2	<input type="text"/>	Add Attachment	Delete Attachment	View Attachment
3) Please attach Attachment 3	AppendixC_MaintenanceCommitme	Add Attachment	Delete Attachment	View Attachment
4) Please attach Attachment 4	AppendixD_Flood Support Lette	Add Attachment	Delete Attachment	View Attachment
5) Please attach Attachment 5	AppendixE.pdf	Add Attachment	Delete Attachment	View Attachment
6) Please attach Attachment 6	AppendixF_BIP_8.5x11.pdf	Add Attachment	Delete Attachment	View Attachment
7) Please attach Attachment 7	<input type="text"/>	Add Attachment	Delete Attachment	View Attachment
8) Please attach Attachment 8	<input type="text"/>	Add Attachment	Delete Attachment	View Attachment
9) Please attach Attachment 9	<input type="text"/>	Add Attachment	Delete Attachment	View Attachment
10) Please attach Attachment 10	<input type="text"/>	Add Attachment	Delete Attachment	View Attachment
11) Please attach Attachment 11	<input type="text"/>	Add Attachment	Delete Attachment	View Attachment
12) Please attach Attachment 12	<input type="text"/>	Add Attachment	Delete Attachment	View Attachment
13) Please attach Attachment 13	<input type="text"/>	Add Attachment	Delete Attachment	View Attachment
14) Please attach Attachment 14	<input type="text"/>	Add Attachment	Delete Attachment	View Attachment
15) Please attach Attachment 15	<input type="text"/>	Add Attachment	Delete Attachment	View Attachment





**Pamela L. Dingman, P.E.**  
County Engineer

**John V. Berry, P.L.S.**  
Deputy County Surveyor

444 Cherry Creek Road, Bldg. C  
Lincoln, Nebraska 68528  
Phone: 402-441-7681 Fax: 402-441-8692

August 30, 2022

Subject: Bridge Investment Program (BIP) Grant Program  
Maintenance Commitment  
Five Lancaster County Bridges

RE: Maintenance Commitment

Please accept this letter as commitment that the completed project submitted in this Bridge Investment Program (BIP) grant application will be maintained by Lancaster County, Nebraska. The project includes the replacement of the five bridges listed below:

C005511215 (C-253)  
C005500625 (C-284)  
C005543520 (G-222)  
C005514415 (Q-110)  
C005506445 (X-129)

Sincerely,

Pamela Dingman, P.E.  
Lancaster County Engineer

F:\Engineer\Bridge\Bridge\_BIP\Summer 2022\MaintenanceCommitment.docx

**Congress of the United States**  
**House of Representatives**  
**Washington, DC 20515**

September 7, 2022

Dear Bridge Investment Program Review Committee,

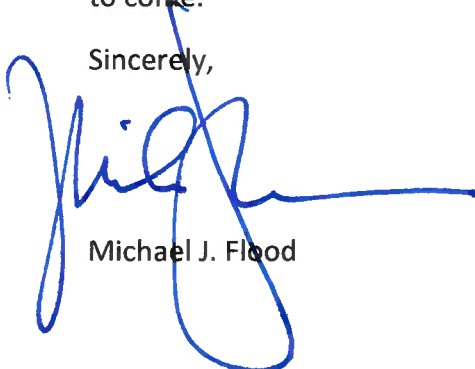
Lancaster County owns nearly 300 bridges, like many counties in my congressional district Lancaster County's Bridges were heavily damaged in major flooding in 2019. These floods caused 28 of Lancaster County's bridges to be closed. Since, 2019 Lancaster County has worked hard to restore their aging bridges to pre-flood condition.

Lancaster County is requesting \$12.4 million (\$9.9 million from the Bridge Investment Program (BIP) and \$2.5 million from local funds). These funds would help replace five (5) of Lancaster County's bridges which are currently rated poor. Two (2) of these bridges are currently closed and three (3) of these bridges are in danger of being closed.

When these bridges become unreliable, they cost farmers time and money to detour around closed structures to get goods to market. In addition, closed bridges often cause our young school drivers to take unfamiliar routes to school and delay school bus transportation for our youngest students. It also increases response times for rural EMS and fire squads. One (1) closed bridge in Lancaster County forces drivers to detour when trying to enter a local state recreation area.

My office supports Lancaster County's commitment to improving infrastructure and making our rural bridges and roads safer for the traveling public. Funding these important bridge projects will bring valuable improvement to our community for years to come.

Sincerely,



Michael J. Flood

**The following attachment is not included in the view since it is not a read-only PDF file.**

**Upon submission, this file will be transmitted to the Grantor without any data loss.**

**AppendixE.pdf**

# FY2022 Bridge Investment Program (BIP)

## 5 Bridges in Lancaster County, Nebraska

