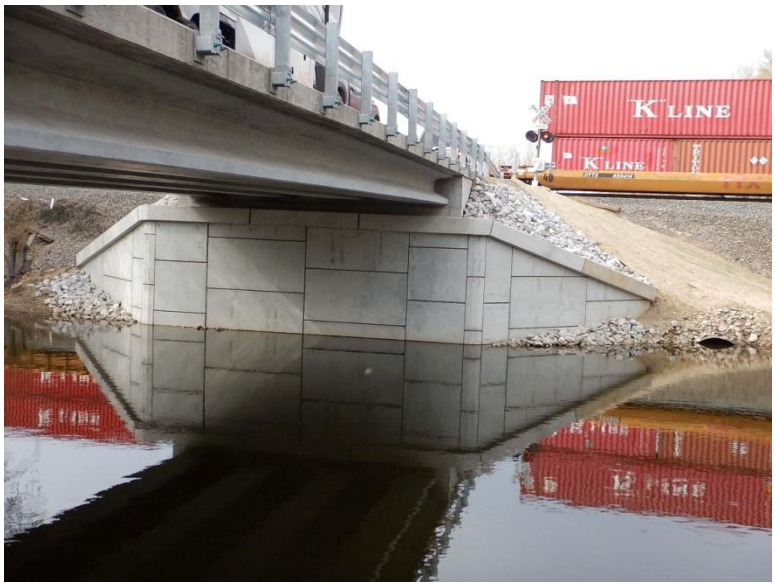
Noble County Highway Department

Transporation Asset Management - Bridges

2024 Bridge Rehabilitation and Replacement Plan



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Purpose

This document was developed in conjunction with the *Bridge Inventory Report* as a budgetary and scheduling tool for bridge rehabilitation and maintenance projects based on funding type and priority. This plan provides a prioritization method to match available funding mechanisms with bridge repair needs to maintain the entire system as economically and effectively as possible. The plan will be updated on a two-year interval to coincide with the biannual bridge inspections.

Bridge Asset Management

The Noble County Highway's approach to all asset management consist of the same four steps: inspection, evaluation, prioritization and action. Inspection is completed per federal requirements and is contracted out to a bridge inspection consultant on a four-year cycle. The bridge condition data and available funding are evaluated and maintenance and replacement prioritized based on the factors below. Replacement, maintenance and funding applications are completed annually. This plan is updated biannually to reflect these improvements and to adjust course as new bridge condition data becomes available.

Bridge Inventory

Noble County currently maintains sixty-two (62) bridges within their jurisdiction. All structures are inspected on a 24-month cycle. Structures with a rating of 4 or less in a critical category are inspected on a 12-month cycle. The inspections are published biannually as the *Noble County Bridge Inventory Report* and publicly viewable at the Noble County Courthouse and the Noble County Highway Department.

Bridge inspection is contracted out in four-year increments to comply with federal requirements. Noble County's current cycle is 2023-2026 with an inspection month of April. Underwater inspections (5-year cycle) were last completed in 2021. Currently, six bridges are inspected on a 12-month cycle (Bridge 33, 41, 56, 59, 61 & 136.)

Lastly, load ratings are conducted at the time of inspection. Any bridges not meeting load requirements are posted with weight restrictions. Currently, there are two bridges that are posted; Bridge 134 at 4 tons and Bridge 136 at 6 tons. These structures are Noble County's top priority for replacement and under currently under development through the LPA federal aid process.

Bridge Condition Update

The most recent bridge condition data is available in the 2023 Bridge Inventory Report. The following bridges were replaced between 2014 and 2023: Bridge 16, 24, 55, 70, 73, 77, 82 and 147. Bridge 6 was replaced with a RCBC and is now under Kendallville’s jurisdiction. Additionally, Bridge 135 was demolished and permanently closed at this time. These resulted in a reduction from sixteen to seven bridges (33, 44, 59, 69, 134, 136 & 200) scheduled for replacements. The 2021/2023 inspections resulted in the addition of eleven bridges (4, 41, 45,

56, 57, 61, 65, 67, 72, 75 & 92) in need of replacement, for a total of eighteen bridges. Of these eighteen, five are currently under development through the LPA program with an additional five scoped for future federal aid applications. The remaining eight are designed for local replacement, likely requiring CCMG grants funds and/or CEDIT funds.

In addition to replacement needs; a list of maintenance items is also included with inspections. All repairs are typically completed within the same year that they are flagged for delinquencies.

Routine maintenance is completed in addition to the above-mentioned items on a regular basis utilizing the detailed maintenance list found on pages 13-15 of the *Bridge Inventory Report*. Maintenance work is completed using highway department crews where applicable. Additional work is contracted out when either cost effective or required.

A Bridge Preservation initiative was enacted in 2020 with fourteen bridge decks being sealed, a list can be found on page 15 of the *Bridge Inventory Report*. All future construction is specified for a bridge deck sealant or internal cure. Going forward all bridge decks are scheduled to be resealed on a 5-year cycle. Additionally, bridge deck overlays are prescribed as needed, typically as a cluster of multiple bridge projects.

Funding Mechanisms

Noble County is one of 16 counties whose road and bridge data were used in the Indiana Soybean Alliance study titled *"Agriculture, Road Conditions, and Road Funding: Making the Case"* to determine state wide local highway funding needs. At the time of their study, they took a detailed look at 15 of the 16 bridges currently on the bridge replacement list and estimated a cost of $15,260,472 for replacement structures. Using local funds ($580,000 per year), it would take the equivalent of 26.2 years of funding to meet our current need. Additionally, this does not account for future deficiencies. This illustrates the importance of having additional funding mechanisms to sustain the bridge program.

The following is an overview of funding types available for bridge preservation or maintenance:

> *Local Public Agency (LPA) Grant Program* - The LPA grant is an 80/20 match program of federal funds that are administered by INDOT on an annual basis. These funds come with the stipulation that projects will meet all federal requirements. These projects typically take 5 or more years to complete all phases of project development.
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> *Cumulative Capital Development (CCD)Fund* - The CCD Fund is the major annual funding mechanism for bridge preservation and maintenance. This fund was last adjusted in 2018 and generates ~$650,000 annually.

Rainy Day Fund - The Rainy Day fund is managed by the Noble County Council and in the event that additional bridge funding is needed, a request can be made to use this fund. Due to the nature of this fund, it is not accounted for in our long-term planning.

Highway General Fund - The highway general fund is the main operating fund for the Noble County Highway Department. Currently, all money from this fund is dedicated to other transportation needs (roads, signs, striping, highway staffing, etc...) There is future potential that this fund could be used once the Noble County Highway system is improved to average PASER rating of 7.0. The local option wheel and surtax is deposited into this fund which gives a local control for increased funding.

CCMG Grant - The *Community Crossing Matching Grant* was launched with the 2016 road funding bill and provides funding at 50/50 or 75/20 up to one million dollars in funding for road or bridge projects. Noble County's grant applications are currently focused on HMA overlay projects, but could be redirected towards bridge projects in the future.

CEDIT – The Noble County Commissioners have direct oversight of the CEDIT funds and a request could be made to fund future bridge projects.

Following the 2013 inspection report, there was a large list of bridges that were in need of replacement, sixteen in total which equate to 25% of Noble County's Bridge Inventory. Combined with limited funding options, this created a unique challenge. In order to make measurable progress, a large amount of grant funding was proposed to supplement limited local funds.

In order to meet this need, multiple grant applications are submitted at each call for projects for the LPA program. The current plan focuses on using local funds to replace smaller and simple bridges (i.e. single span less than 40') and to use grant application on larger and more complex structures. The attached Bridge Replacement Plan has funding split between local and federal (LPA) funds. The plan assumes the award of one LPA bridge replacement grant annually.

Considerable progress has been made towards the replacement of several existing structures; however, the current program is not sustainable. Several additional bridges were added to the replacement list following the 2021 and 2023 bridge inspections. There will also be a wave of box beam structures added to the replacement list within the next 10 – 15 years.

With limited local funds, there will eventually not be enough funds available for the local match required for federal and state grants. Without a designated Cum Bridge Fund, a multi-faceted funding solution will be required, including adjustments to the Highway's CCD distribution, an increase in the local option wheel and surtax and/or additional funding from the CEDIT and Rainy Day funds.

Prioritization

Whenever practical, repair recommendations from the bridge inventory report are followed to significantly increase the life and safety of all bridges. In many cases, extensive repairs are not feasible since the structures would still be deficient in other aforementioned vital areas. Rusting is a major problem on any bridge consisting of steel members which results in deterioration of members that can greatly decrease a structure's future usable life. Cleaning, painting/sealing are prioritized as preventative maintenance. However, there are still several bridges that are beyond the point of rehabilitation and will require full replacement.

With limited funding sources, it is critical that our bridges be replaced in the most effective order. The following are the factors we use to prioritize the bridge replacement schedule.

The Average Daily Traffic on a bridge measures its importance to the County's transportation system. Therefore, structures which receive high traffic counts are given priority over those bridges which handle only a few vehicles per day.

The Structural Condition of a bridge helps estimate the length of time the structure can safely carry traffic at its present capacity. Many structures have deteriorated from age, weathering or other factors. The lower the condition ratings, the higher the replacement priority.

Bridge Alignment and Width is a major indicator of the safety of the structure to the traveling public. Factors included are horizontal and vertical alignment to the approaches in relationship to the bridge. Bridges with alignment and width safety issues are given higher priority.

Load Capacity indicates the safe load that can repeatedly travel over the bridge in its present structural condition. Structures with low load capacities or load postings are given higher replacement priorities.

Waterway Adequacy indicates if the waterway area under the structure is large enough to handle floodwaters. Existing channel alignment in relationship to the substructure is also analyzed.

Replacement Cost / Funding Source - Large structures cost a great deal to replace and are impractical to replace using traditional funding. Instead, the large structures are separated out and programmed for Federal LPA (80/20) grants. The remaining smaller bridges are replaced using local funds and utilizing a cost-effective design. Community crossing grants are used towards construction costs were applicable.

Bridge Replacement List

The following is a summary of all current bridges that are in need of reconstruction:

*Bridge 136** - Bridge 136 is a steel pony truss bridge (107' span) with a timber deck that was constructed in 1906. It carries CR 400 E over CSX RR. The bridge is structurally deficient with a load rating of 6 tons. This project was awarded an LPA grant and is under development for construction in 2023.

*Noble County has a *Memorandum of Agreement* (MOA) in place with CSX that provides a financial commitment from CSX for the removal of Bridge 135 and the replacement of Bridge 134 and 136.

*Bridge 134** - Bridge 134 is a steel pony truss bridge (107' span) with a timber deck that was constructed in 1906. It carries CR 225 E over CSX RR. The bridge is structurally deficient with a load rating of 4 tons. This project was awarded an LPA grant and is under development for construction in 2025.

Bridge 44 - Bridge 44 is a single span precast box beam bridge (66' span) that was constructed in 1958. The structure has a Sufficiency Rating of 67. This project was awarded an LPA grant and is under development for construction in 2024.

Bridge 69 - Bridge 69 is a single span precast box beam bridge (86' span) that was constructed in 1971. The structure has a Sufficiency Rating of 70.9. This project was awarded an LPA grant and is under development for construction in 2026.

Bridge 59 - Bridge 59 is a single span precast box beam bridge (85' span) that was constructed in 1960. The structure has a Sufficiency Rating of 53.9 and is scheduled as the top bridge priority for the 2021 LPA Grant cycle, which correlates to a projected replacement date in 2027.

Bridge 61 - Bridge 61 is a single span precast box beam bridge (67' span) that was constructed in 1960. The structure has a Sufficiency Rating of 53.6 and is scheduled as the top bridge priority for the 2023 LPA Grant cycle, which correlates to a projected replacement date in 2028.

Bridge 56 - Bridge 56 is a single span precast box beam bridge (77' span) that was constructed in 1960. The structure has a Sufficiency Rating of 62.5 and is scheduled for the 2023 LPA Grant cycle, which correlates to a projected replacement date in 2028.

Bridge 57 - Bridge 57 is a single span precast box beam bridge (70' span) that was constructed in 1963. The structure has a Sufficiency Rating of 72.5 and is scheduled as the top bridge priority for the 2024 LPA Grant cycle, which correlates to a projected replacement date in 2029.

Bridge 65 - Bridge 65 is a single span precast box beam bridge (86' span) that was constructed in 1972. The structure has a Sufficiency Rating of 76.5 and is scheduled as the top bridge priority for the 2025 LPA Grant cycle, which correlates to a projected replacement date in 2030.

Bridge 67 - Bridge 67 is a single span precast box beam bridge (64' span) that was constructed in 1920 and reconstructed in 1973. The structure has a Sufficiency Rating of 75.4 and is scheduled as the top bridge priority for the 2026 LPA Grant cycle, which correlates to a projected replacement date in 2031.

Bridge 33 - Bridge 33 is a single span precast box beam bridge (34' span) that was constructed in 1920 and reconstructed in 1973. The bridge is functionally obsolete with a Sufficiency Rating of 49.2 and is scheduled for reconstruction in 2025 using local funds and utilizing a cost-effective design.

Bridge 75 - Bridge 75 is a single span precast box beam bridge (45' span) that was constructed in 1970. The structure is structurally deficient with a Sufficiency Rating of 39.2 and is scheduled for reconstruction in 2026 using local funds

Bridge 41 - Bridge 41 is a single span precast box beam bridge (27' span) that was constructed in 1920 and reconstructed in 1974. The structure is structurally deficient with a Sufficiency Rating of 53.5 and is scheduled for reconstruction in 2027 using local funds and utilizing a cost-effective design.

Bridge 200 - Bridge 200 is a series of two corrugated metal pipes (29' span) that were constructed in 1970. The structure has a Sufficiency Rating of 82.0, but shows signs of heavy rusting and currently scheduled for replacement with a single box culvert in 2028, which may permanently remove it from the bridge inventory.

Bridge 45 - Bridge 45 is a single span precast box beam bridge (41' span) that was constructed in 1970. The structure has a Sufficiency Rating of 65.6 and is scheduled for reconstruction in 2029 using local funds and utilizing a cost-effective design.

Bridge 4 - Bridge 4 is a single span precast box beam bridge (23' span) that was constructed in 1970. The structure has a Sufficiency Rating of 73.8 and is scheduled for reconstruction in 2029 using local funds and utilizing a cost-effective design.

Bridge 72 - Bridge 72 is a single span precast box beam bridge (28' span) that was constructed in 1920 and reconstructed in 1976. The structure has a Sufficiency Rating of 66.9 and is scheduled for reconstruction in 2030 using local funds and utilizing a cost-effective design.

Bridge 92 - Bridge 92 is a single span precast box beam bridge (25' span) that was constructed in 1920 and reconstructed in 1976. The structure has a Sufficiency Rating of 73.0 and is scheduled for reconstruction in 2030 using local funds and utilizing a cost-effective design.

Bridge Replacement Plan

Please see the attached *2024 Noble County Bridge Replacement Plan*. The plan lays out the projected schedule and phases for all bridges that are currently scheduled for replacement. All data is updated annually as new inspection, replacement and grant data becomes available.

Additionally, the *Bridge Asset Management Plan* is attached and contains data for all 62 bridges.

Bridge Deck Overlays

The best method to extend the life of our existing bridges is to prevent moisture and chlorides from penetrating the bridge deck or superstructure. There are existing box beam bridges that are especially susceptible to this type of deterioration. A bridge deck overlay can provide protection to these structures and cost-effectively extend the life of existing bridges. The construction scope consists of milling off any existing bituminous or chip and seal overlay material, milling the required transition length off each end of the bridge, installing a new waterproof membrane on the existing bridge beams, and placing a new HMA surface over the entire milled project length.

The following bridges received or are programmed for Bridge Deck Overlays:

- 2014: Bridge 62, 63, 65, 66 and 80.
- 2024: Bridges 23, 84, 96, 99 and 102.

Bridge Preservation Plan

The best method to extend the life of our new bridges is to prevent moisture and chlorides from penetrating the bridge deck or superstructure. In 2020, the Noble County Highway Department initiated a bridge preservation initiative. The following bridges were in good condition and relatively new, making them prime candidates slated to receive a sealant on their concrete wearing surfaces:

Bridge #	Roadway	Over	Con. Date	Width	Length	Deck SF
57-00001	MARTIN ST	ELKHART RIVER	1993	40'	89'	3,560
57-00002	BRIDGE ST	ELKHART RIVER	2009	31'	97'	2,959
57-00005	CR 1000E	N&S RR	2008	39'	112'	4,297
57-00016	B CR 500S	BLACK CREEK	2017	24'	48'	1,171
57-00024	B CR 950E	BILGER DITCH	2017	24'	63'	1,524
57-00050	CR 200N	SOLOMON CREEK	1989	33'	60'	1,980
57-00054	ALBION RD	ELKHART RIVER	1995	33'	103'	3,399
57-00070	B CR 600W	ELKHART RIVER	2014	39'	87'	3,350
57-00132	CR 800E	CSX RR	2008	27'	159'	4,221
57-00139	LONG LAKE RD	CSX RR	1992	33'	146'	4,818
57-00142	CR 350W	CSX RR	2003	35'	155'	5,348
57-00147	B PIGEON	ST ELKHART RIVER	2018	27'	116'	3,132
57-00201	OLD SR 3	BLACK CREEK	1986	47'	88'	4,131
Total						43,889

Going forward, all bridge reconstruction projects are scheduled to be sealed or utilize an integral cure during construction. The new structures are added to the preservation list and will be treated with sealants on a five-year cycle in order to extend their useful life. The next preservation treatment cycle will be 2025.