NEBRASKA

Good Life. Great Journey.

DEPARTMENT OF TRANSPORTATION

County Bridge Match Program Selected Bridge Sites - December 13, 2024

Summary

Proposals Submitted	46
Accepted Proposals	11
Proposed Bridges	70
Accepted Bridges	15
Proposals Total Cost	$38,263,385
Program Budget	$4,000,000
Program Cost	$4,038,617

Road 726 Bridge Replacement Project

Furnas County, Nebraska

Road 726 Bridge Replacement Project

The bridge is located at the intersection of Road 726 and Elk Creek on the Gosper/Furnas County Line in Nebraska. The creek is ephemeral and runs during rain events. The existing structure is a steel pony truss that was built in 1935. Currently it is load posted at 6T, 9T, and 12T. The adjacent land use is agricultural. The road serves as a local route. Furnas County has a population of 4,636 as of the last census and the area is agriculturally based. A significant portion of the traffic the bridge sees is agricultural equipment. The structure is proposed to be replaced with a corrugated metal pipe culvert structure.

This bridge is an ideal candidate for CBMP funding as the structure serves as a market route for the NE portion of the county. Crossings over the Elk Creek for access to Highway 283 are relatively spaced out. Due to the load restrictions on this structure, overweight agricultural traffic must detour up to 6 miles. The structure is also relatively narrow at less than 16' wide, which forces approaching head on traffic to slow down as they approach or wait for farm equipment to pass. It is also likely the load rating of the structure will continue to worsen. The fracture critical components of this bridge are prone to progressive defects such as rust and fatigue that are likely to get worse as this structure ages. The structure has reached the end of its useful life and major repairs or rehabilitation is not prudent to improve the load rating. Currently the structure has some maintenance challenges such as the load signs, object markers, guardrails, and fracture critical elements frequently being damaged due to the narrow width of the bridge. The bridge has increased inspection costs due to fracture critical elements. The counties has major financial barriers towards replacing the structure as there are limited funds due to a smaller tax base. Raising funding for a major structure at this location would be a difficult task on their own.

A corrugated metal pipe culvert structure at this location would be a great fit for these counties for a variety of reasons. Financially, there is a signed interlocal agreement between the counties on how costs for this project would be shared, eliminating confusion for this unique site. From a design perspective the structure would be significantly wider than the existing bridge as well as having no legal load restrictions. The proposed structure is sized so that no approach guardrail is necessary. Maintenance costs would be reduced as there would be less or no signs, guardrail and or superstructure elements to repair from impact damage. Inspection costs would also be reduced due to the ease of inspection of pipe culverts. The challenges in replacing the structure are reduced with a pipe culvert as the county has the equipment and a crew capable of completing the work. A pipe culvert would also reduce the time the roadway would be closed to traffic. This would be important at this location as the proposed work would need to be started/finished before planting or harvest. Long term benefits for this structure would be the durability and lifespan of a pipe culvert. Many pipe culvert structures will last over 50 years. Overall, the benefits discussed make a corrugated metal pipe culvert a best fit option for this community and site.

In conclusion, replacing the aging steel pony truss bridge with a corrugated metal pipe culvert structure is a practical and beneficial solution for Furnas County. The existing structure is nearing the end of its useful life, with increasing maintenance challenges, limited load capacity,

and safety concerns due to its narrow width and load restrictions. A pipe culvert offers numerous advantages, including increased traffic capacity, improved safety for both local and agricultural vehicles, and reduced long-term maintenance and inspection costs. With both counties financial constraints in mind, the affordability and ease of construction of a pipe culvert make it an ideal choice. The durability and longevity of the proposed structure ensure its effectiveness for many years to come, providing lasting benefits for the community, enhancing safety, and supporting the local agricultural economy.

Gage County Bridge Replacement on Chestnut and 82nd Road

Gage County is a predominantly rural area where roads and bridges are the essential threads connecting families, farms, and businesses. Two critical yet deteriorating structures, the bridges on Chestnut Road and 82nd Road, have reached a point where immediate replacement is necessary to ensure the safety and sustainability of our community. This proposal seeks CBMP funding to replace these aging truss bridges with modern triple 12'x12' concrete box culverts (CBCs), a solution designed to address current challenges while supporting the county's long-term infrastructure goals.

The Chestnut Road Bridge

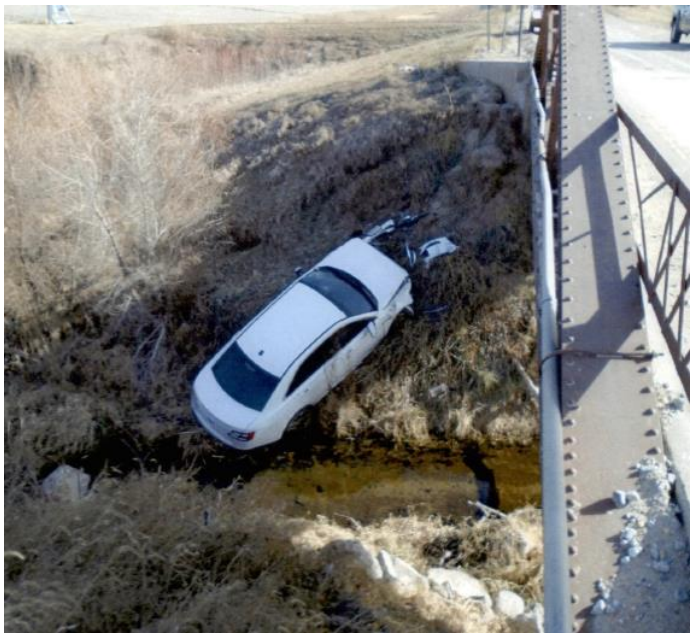
The Chestnut Road bridge, constructed in 1935, is a 58-foot-long truss bridge with a deck width of just 18.8 feet. It was built during an era when vehicle loads and traffic volumes were far lighter than today's demands. Now, nearly 90 years later, the bridge struggles to meet the needs of the 110 vehicles that cross it daily.

Current Condition Ratings:

- **Deck:** 6
- **Superstructure:** 5
- **Substructure:** 6
- **Posted Load Rating:** 15 tons

The structure is no longer sufficient for modern traffic, particularly heavy agricultural equipment and freight trucks, which are vital to the county's economy. Its narrow width and aging design create significant safety concerns for motorists, especially during periods of high use, such as planting and harvest seasons.

Tragically, this bridge has also been the site of two fatalities—devastating losses for our close-knit community. These incidents underscore the urgent need to address the bridge's safety deficiencies.



In 2000, about $5,000 in channel work was completed to mitigate issues caused by water flow. However, the underlying structural limitations remain unresolved. A replacement is the only viable option to ensure the safety and reliability of this critical route.

The 82nd Road Bridge

The bridge on 82nd Road, built in 1971, is a 52-foot-long truss bridge with a deck width of 18.7 feet. Despite being slightly newer than the Chestnut Road bridge, it faces similar challenges in accommodating modern traffic and load requirements.

Current Condition Ratings:

- **Deck:** 5
- **Superstructure:** 6
- **Substructure:** 5
- **Posted Load Rating:** 22 tons

In 1999, the county spent $16,000 to address water undermining issues by installing a new sheet pile back wall on the southeast wing and performing additional channel work. Despite these efforts, the bridge remains inadequate for the demands of today's traffic, especially since a new agricultural building in the vicinity has significantly increased truck traffic.

The current weight restrictions force heavy vehicles, including farm equipment and freight trucks, to take lengthy detours, adding time, fuel costs, and inconvenience. These detours divert traffic through a nearby village, creating additional wear on alternate routes and increasing safety concerns for residential areas instead of using a direct route to a state highway. The traffic count of 157 was taken just before the building of this facility so not only would the average daily traffic be higher with this business but would increase with an adequate load rating.

The Community and Economic Impact

Both bridges are situated in agricultural regions where efficient transportation is essential. Farmers and agri-businesses rely on these routes to move goods to the market. The detours caused by the bridges' weight restrictions disrupt operations, increase expenses, and diminish productivity.

Public safety is another critical concern. The narrow widths of these truss bridges create hazardous conditions, particularly during adverse weather or peak traffic times. Emergency response times are also impacted, as fire and rescue teams must carefully plan routes to avoid load-restricted bridges, which can delay critical care. These delays compromise the effectiveness of emergency services, putting rural residents at risk, particularly given the ROUTES Initiative finding that detours in rural areas can be three times longer than in urban settings.

The Case for Replacement

Gage County has a vast and aging infrastructure network with many structures requiring maintenance and replacement in addition to those on Chestnut and 82nd Roads. Based on structural assessments and cost analyses, replacing these two bridges with triple 12'x12' concrete box culverts are the most practical solution.

Concrete box culverts offer numerous advantages:

- **Increased Load Capacity:** The CBCs will accommodate modern agricultural equipment, freight trucks, and emergency vehicles, eliminating the need for detours.
- **Improved Safety:** Wider crossings with appropriate shoulders will reduce the risk of accidents.
- **Durability:** CBCs require less maintenance than truss bridges, offering a long-term solution at a fraction of the cost of repeated repairs.

Broader Infrastructure Challenges in Gage County

The replacement of these two bridges is part of a larger infrastructure challenge in Gage County. An assessment of the county's bridges considering structural integrity, weight restrictions, and spans, excluding hundreds of smaller culvert structures, was eye opening. There are 177 structures lacking in those areas that should be replaced by structures, such as corrugated metal pipes (CMP), concrete box culverts (CBC), medium-bridge structures, and large-bridge structures. Based on recent project estimates and assumptions on the type of replacement used in each location, it revealed a staggering $280.3 million in necessary replacements for structures throughout Gage County. These figures highlight the critical need for external funding to address aging infrastructure in rural Nebraska.

Gage County's tax base is insufficient to bear the financial burden of these replacements alone. Support from CBMP is essential to ensure the safety and sustainability of our infrastructure without imposing undue hardship on local taxpayers.

Benefits of CBMP Funding

By investing in these projects, CBMP will help Gage County:

- Restore safe and reliable transportation routes for residents, businesses, and emergency responders.
- Support the region's agricultural economy by enabling the efficient transport of goods and equipment.
- Reduce future maintenance costs through durable, low-maintenance infrastructure.
- Protect rural communities from the devastating consequences of infrastructure failures.

While the temporary road closures required during construction will inconvenience some travelers, Gage County has a proven track record of maintaining open communication with the public. For these projects, the planned detour routes will be approximately 6–7 miles long, carefully designed to keep the majority of traffic on county roads capable of handling increased traffic volumes. This approach minimizes wear and tear on smaller local roads and ensures smoother traffic flow. Additionally, local residents familiar with the area will have the option to use nearby routes to navigate around the construction zone, further mitigating the impact on their daily commutes.

This proactive approach to communication and thoughtful detour planning will help maintain community support and minimize the disruptions associated with construction.

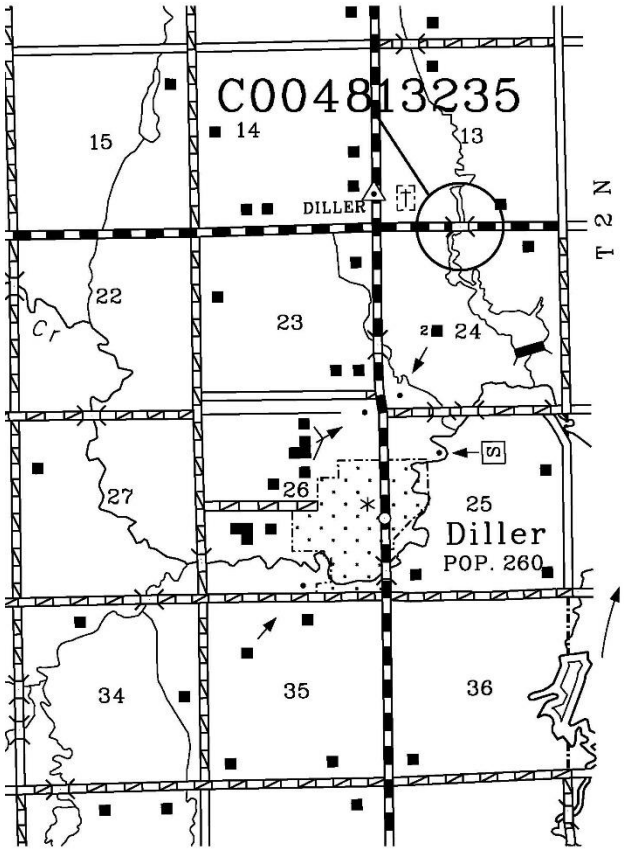
Conclusion

The bridges on Chestnut and 82nd Roads are more than just infrastructure—they are lifelines for the residents and industries of Gage County. Their current state poses unacceptable risks to public safety, economic activity, and quality of life. Replacing these bridges with modern CBCs will not only address these urgent issues but also provide a sustainable foundation for the county's future growth.

JEFFERSON COUNTY

Structure number C004813235 is located on Road 711 in Jefferson County. Road 711 is referred to as the PWF road (Pawnee-Wymore-Fairbury). This paved local road serves as a vital link in Southeast Nebraska. The segment of the PWF road that includes this structure will be reconstructed soon utilizing federal funds that were directly allocated to the project. The total project cost is estimated to be nearly $13.5 million. The federal funding was $7.5 million, leaving nearly a $6 million shortfall. Utilizing the County Bridge Match Funding of $500,000 will assist the County in making up this shortfall.

Structure No. C004813235



This 50’ Steel Girder bridge was originally built in 1935 and currently is rated four (“poor”) for superstructure and substructure condition. Figure 1 and Figure 2 show the superstructure condition, and Figure 3 shows the substructure condition. The bridge is rated a six (“fair”) for deck condition (shown in Figure 4 and Figure 5). The bridge is load-posted (code P in field 41 of the National Bridge Inventory [NBI]), and there is an 18.6-mile detour length (field 19 of NBI). It is a scour critical bridge, with “bridge foundations [that are] determined to be unstable for calculated scour conditions” (item 113 of NBI5). As shown in Figure 6, the 50-foot bridge directly abuts the water, while the new 80-foot bridge will be longer to conform with modern bridge design standards. Both school buses and EMS vehicles use PWF Road and this bridge regularly, with four school bus routes having no choice but to use portions of PWF Road daily.

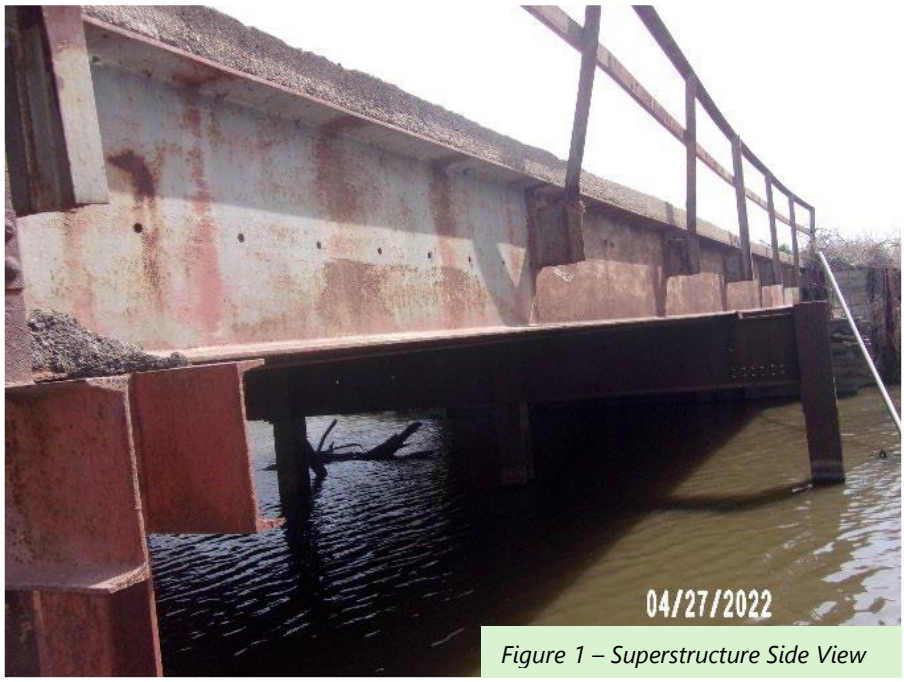


Figure 1 – Superstructure Side View

Figure 2 – Superstructure view from underneath.

Figure 3 - Substructure

Figure 4 - Deck

Figure 5 – Northeast Wing

Lancaster County, NE
CBMP-Narrative\Bridge G-222

Background

Lancaster County is pleased to submit the G-222 bridge (NBI, C005543520) for County Bridge Match Program (CBMP) funding. This bridge is located on N. 98th Street and crosses Salt Creek between the corporate limits of Lincoln and Waverly, NE (**Figure 1**). The County desires funding assistance to construct this project in 2025 for the following reasons. County project 23-28 will replace the 98th Street box culvert between Salt Creek and Waverly Road next year. Bridge G-222 designs are 90% complete which would consolidate construction impacts. Also, a new data center and Nebraska State Corrections facility have broken ground north of I-80. Completing this project now will best serve economic development and public safety in the County. Finally, The bridge now exceeds 76 years old with steel H-piles that are not resilient to Salt Creek conditions. The context, challenges, solutions, and benefits all highlight the important role the bridge has served and why CBMP funding is needed now.

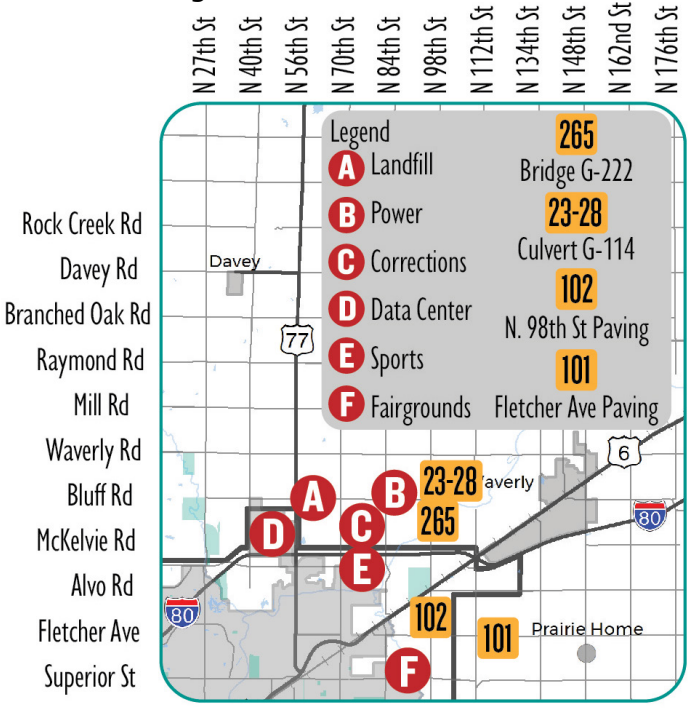


FIGURE 1: Bridge G-222 is project 265 on the Lincoln MPO 2050 LRTP. Located between Lincoln and Waverly, this structure will receive additional traffic from new developments north of I-80, and the 98th St. and Fletcher Ave paving projects.

Historic Context, Community Impact, and Significance

Salt Creek provides the largest watershed for stormwater runoff through Lancaster County. As it flows northeastward taking on drainage from large subwatersheds towards the Platte River, through Cass and Saunders County, this 44-mile-long creek would hardly be recognized today by the early settlers that began moving to the area between 1855 and 1890. Many settlers arrived with support of Federal Government land grants with an intent to farm using traditional methods or to extract salt from wide, salt flats along the creek's meandering channel. In its pre-1890's form, the meandering stream channel and frequent flooding were viewed as impediments to the potential for urban growth of Lancaster, Nebraska. Growth and immigration to the area persisted as Lincoln became the State's capitol and a rail center for Burlington & Missouri River Railroad, Midland Pacific, Atchison & Nebraska, Union Pacific, Chicago & North Western, Missouri Pacific, and the Chicago, Rock Island & Pacific railroads.

By 1891, the US Army Corps of Engineers had been assigned the task of streambed adjustment and channel widening in eastern Nebraska which included Salt Creek. Between 1891 and 1942, the Agency straightened the channel of Salt Creek from the Platte River to the mouth of Haines Branch near the intersection of US Hwy 77 and Van Dorn Parkway in Lincoln. Local agencies also channelized Oak Creek as it flowed into Lincoln and drained into Salt Creek. The hydrologic impact that resulted from the extent of this straightening cannot be understated. With respect to just the 98th Street bridge location, G-222, channel widening work between 134th Street north of Waverly and 56th Street on north Lincoln removed between five and six miles of hydrologically-critical, channel flow length, cutting it down 40% to 7.6 miles from the original 12.5. Where water had flowed at a rate that the landscape could accommodate, these channel modifications created a raceway for stormwater runoff and a burden to maintain bridges.

Historic Context, Community Impact, and Significance (Cont.)

County records indicate that the first road and bridge constructed to cross Salt Creek on 98th Street near the current alignment was approved in 1875 (**Figure 2**). Township maps of the area dating back to 1921 show the original, meandering alignment of Salt Creek where this bridge location, south of the current crossing, provided a link for farmers needing access to rail and grain storage as well an increasing number of residents gaining access to automobiles at the turn of the century.

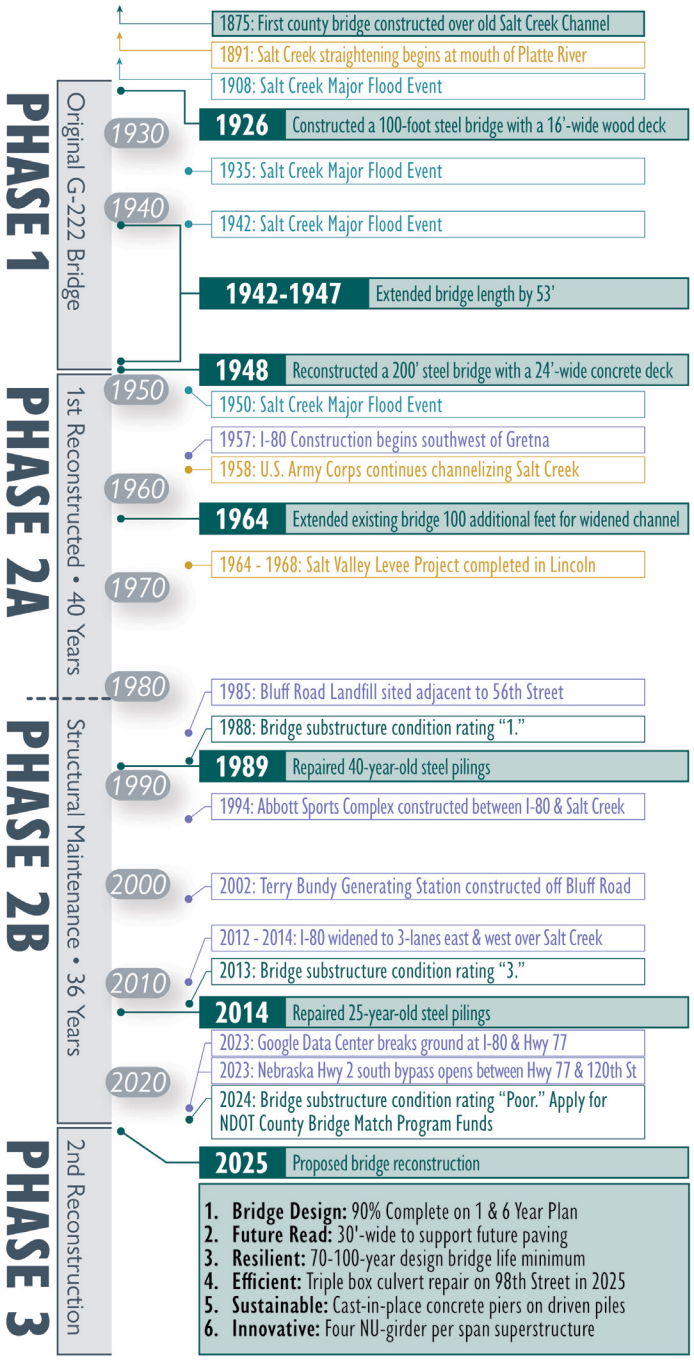


FIGURE 2: Salt Creek straightening work by the USACE in Lancaster County began more than 133 years ago. Lancaster County efforts to maintain a safe and reliable bridge at N 98th Street is approaching the most expensive phase of structural maintenance for the outdated design.

By straightening the Salt Creek Channel, the crossing location was moved (**Figure 3 & 4**) approximately 0.5 miles north. On September 10th, 1926, the first G-222 bridge was opened. It provided a new steel bridge 100-feet-long to span the initial channel cross section. The 16-foot-wide wood deck structure served the transportation function at the time but would prove to be undersized for the demands of increasing stream flows from the west. Flooding events continued and additional channelization brought an ever-increasing amount and rate of stormwater to bridge G-222. Historic flooding in 1935 and 1942 resulted in the reassessment of watershed flood risks and channel cutting from higher-than-expected flow velocity. A mere 22-years after its construction, bridge G-222 was required to be retrofit in both directions, lengthening the bridge by over 50% to 153-feet. Improvements still would not hold up under the hydrologic demands created by the urbanizing watershed. By 1947, infrastructure funding was provided to reconstruct the entire G-222 bridge at the current location to better accommodate demands of Salt Creek flows. This new design increased the bridge length another 30% from the previous 153-feet with a new steel bridge and a concrete deck which now spanned 200-feet-long over Salt Creek.

Bridge G-222 remains a testament to land use changes that have occurred in Lancaster County and the powerful impact of flooding. In 1950, another deadly flood killed nine people, destroyed 600 homes, and wiped out 80 local businesses in Lincoln. From 1964-68, the national design storm standard changed so new levees would protect the 100-year flood instead of the 50-year flood. The USACE Salt Valley Project raised embankment height for levees approximately 13.5 miles through Lincoln. Downstream, increased flood flows and velocities resulted, straining the undersized channel passing under 98th Street. Bridge G-222 was retrofit again in 1964, extending the length to 300-feet, a full 200% longer than the first bridge constructed in 1926. Now 76 years old, the bridge has endured major retrofits to the 1948 design with numerous structural repairs.

Historic Context, Community Impact, and Significance (Cont.)

The bridge provides access to rural areas north of Lincoln and Waverly where the floodplain and natural resources along Salt Creek discourage urban growth. Waverly Fire & Rescue and Urgent Health Care, located in Waverly, serve the Terry Bundy Generation Station and Lincoln Landfill via a route from Highway 6, north on N. 98th Street, and then west along Bluff Road. As Lincoln expands eastward into the Stevens Creek basin, an East Beltway could be constructed along a 127th Street corridor, increasing urban development on 98th Street from US Hwy 6 to Havelock Avenue.

Properties between N. 98th and US 77 are mostly above the floodplain. Current industrial development in this area will create more demand for semi-trucks and heavy equipment. The Terry Bundy Generation Station and the Lincoln Landfill are both located in this area. Also planned for this area, a $350 million State Correction Facility has broken ground between N. 70th and N. 98th Streets north of I-80. Lancaster County maintenance shop for District 1 also uses Wavely Road to access 98th Street and Township roads south of the BNSF/ US Hwy 6 corridor. Without the G-222 bridge, maintenance equipment and more heavy trucks would be required to divert through Lincoln and Waverly. Heavy equipment can use this bridge to bypass urban areas and use an existing I-80 undercrossing.

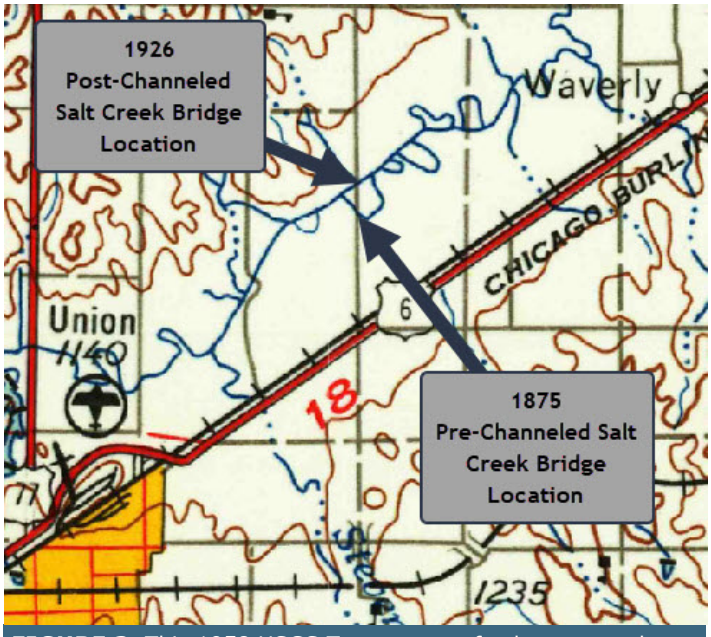


FIGURE 3: This 1958 USGS Topo map perfectly captures how Salt Creek was straightened between Lincoln and Waverly.

Challenges in Maintenance and Replacement

Long Range Planning by the Lincoln MPO has included G-222 on the list of bridge replacement projects. Lancaster County has completed the design for the bridge replacement but has not yet established an adequate funding source to complete the reconstruction project. The bridge condition is currently listed as "Poor." Twice prior, the bridge condition rating has been reduced to a "1" leading to major structural repairs (**Figure 5**) for aging beams that had become corroded due to the salt content of its namesake Creek. As frequent inspections and maintenance continue for this 24-foot-wide bridge, the expense and time required to maintain the current structure will be significant and take away resources that could be better spent on keeping bridges rated in Fair condition throughout the County from becoming Poor as well. Salt Creek continues to corrode the bridge substructure which is steel H-pile. This will be an ongoing concern until a corrosion resistant substructure is in place. Load rating for the current bridge superstructure is a combination of Type 3 (34 Tons), Type 3S2 (37 Tons), and Type 3-3 (43 Tons). A new bridge with cast-in-place concrete piers and abutments on driven pilings are needed to reflect a modern bridge meeting current AASHTO and NDOT standards. The current bridge also limits the options available for Lincoln and the County to pave 98th Street north of US Hwy 6 because of the 24-foot-wide paved bridge surface. A new bridge cross-section of 30-feet-wide can best accommodate anticipated vehicle demands and future roadway improvements.

FIGURE 4: Meandering loops of Salt Creek northwest of Waverly were cut through to straighten the channel where Bridge G-222 will be reconstructed.

Proposed Solution and Suitability

The design proposed to reconstruct G-222 bridge is a skewed, three span 310-foot-long, precast prestressed concrete girder (100', 110', 100') superstructure with cast-in-place concrete piers and abutments on driven piling. Following current AASHTO and NDOT standards, the clear roadway width will be 30-feet. Safety is inherently prioritized in the design as well with guardrails height of 34" and concrete material. Approaches to the bridge will consist of grade beams and twenty-foot-long reinforced concrete slabs. This bridge configuration accommodates future asphalt and concrete roadway pavement as roadway traffic increases and N. 98th Street is paved. Another benefit to this bridge type is the substructure. The concrete piers, when exposed to Salt Creek, will not corrode or degrade. This bridge will be in service (70-100 years) with minimal maintenance. It is designed for modern loading and will not require load posting over its service life.

The new G-222 bridge design is also innovative. It utilizes a four girder per span superstructure that does not require connection hardware (diaphragms) outside of the bearings. This design allows for streamlined superstructure placement during construction. The innovative design also streamlines construction timelines which reduces the road closure duration during the construction process. The bridge underside (NU girders) is clearly visible from below and does not have the bracing connections typically incorporated in steel superstructures. This foresight of design allows for a future inspection process that requires fewer inspection elements and reduces the inspection and maintenance needs.

The most important aspect of this design is its corrosion resistance. The current bridge substructure includes exposed steel piling that have been cut and replaced multiple times within 76 years. The new bridge concrete substructure is highly resistant to saline characteristics of Salt Creek and will match the superstructure life.

The G-222 bridge is not the only structure ready for replacement. The recent July 2, 2024, storms and flooding washed out the G-114 and G-226 culverts approximately 700 ft. north of G-222. The 90% design plan set is complete and the County has scheduled their replacement with a new triple, 8-foot-wide by 5-foot-high, box culvert in 2025. Significant efficiencies can be gained by completing this culvert replacement project at the same time as the reconstruction of G-222 over Salt Creek. Concurrent projects would best utilizes the timing of road closure, consolidate material staging areas, and collocate construction equipment given their proximity. This allows for inherent cost savings and fewer disruptions to the traveling public. Completing the G-222 bridge and the G-114 culvert together also brings the road width and subgrade to standard so that future N. 98th Street paving can occur without additional structures work.

Design for this bridge reconstruction will support sustainability and resilience (**Figure 6**) for infrastructure investments. The bridge superstructure, precast prestressed concrete NU beams, can be fabricated in Nebraska. The aggregate and cement used in their fabrication are also produced in Nebraska. This ensures maximum sustainability while also stimulating the Nebraska economy. In addition, Nebraska contractors have necessary experience constructing NU-girder bridges for the State and other counties. This promotes competition and ensures quality deliverables while enabling a predictable construction schedule.

FIGURE 5: Salt Creek has placed substantial wear and tear on Bridge G-222 since the current piling locations were constructed in 1948. This 2021 bridge inspection photo highlights the on-going battle between the steel H-piling and saline conditions of Salt Creek. Corrosion of H-pile footings have required two rounds of structural replacement in 75 years. The new concrete cast-in-place forms will provide a resilient bridge structure expected to last greater than 70-years without any major structural repairs.

Future Context

The alignment of N 98th Street and reconstruction of bridge G-222 provides strategic benefits for Lancaster County Engineering Department. North of Waverly, N 141st Street is the next closest crossing of Salt Creek and further east, N 162nd Street is the next closest north-south corridor that crosses US Hwy 6, BNSF RR, and Salt Creek. To the west of N 98th Street, N 84th Street is segmented at US Hwy 6 and the Salt Creek crossing is skewed. The N 70th Street bridge crossing is within the City of Lincoln and carries industrial traffic north of Havelock Railyard while most residential traffic uses US Hwy 6 to exit the City to the north or northwest toward I-80. With increasing industrial growth along US Hwy 77 and the interchange at I-80, the County anticipates increasing demand for heavy truck traffic using N 98th Street instead of navigating through the City street network. Current traffic volume estimates were made prior to the relocation plans of the Nebraska State Correction Facility north of I-80. The new location is beneficial to the State and the City of Lincoln and is also expected to place additional traffic demand on N 98th Street.

CBMP Funding Benefits

The land area north and west of G-222 is located within Lincoln's longer term growth area boundary; beyond 50-years due to the challenges of floodplain development and a lack of sewer infrastructure. Funds available for G-222 Bridge replacement of this magnitude are a cost-burden for the County to complete alone. Local cost-share with the City of Lincoln is not available because the location is just outside the future urban growth boundary. The County is seeking approximately 15% of the funds needed for this project as a match by the State. The prompt relocation of the Nebraska State Correction Facility site has placed an increased urgency for the County to bring bridge G-222 up to a safe and reliable design standard that can support the future growth that may result from supportive developments and other industrial expansion along US 77. By doing so now, N 98th Street could also best serve the future needs as the area north of I-80 grows and provide efficient, reliable, and redundant access between US Hwy 6 and 77 if an alternate evacuation route from I-80 at US Hwy 6 or 77 was needed. This bridge design and construction process will be documented and incorporated into a presentation for acceptance at the Nebraska Local Bridge Conference where lessons learned, and best practices will be shared. The bridge is expected to last longer than seventy years and will provide a significant, ongoing benefit to the County, adjacent communities, and the State. The estimated construction cost is $3.5 million. Recent bids on similar bridge reconstruction projects have proved competitive and the County is committed to providing the local cost-match needed to reconstruct the new bridge. County Bridge Match Program funding available from the State of Nebraska is requested in the amount of $500,000 for Lancaster County to complete the reconstruction of bridge G-222 in 2025.

FIGURE 6: The current bridge location passes stream flows that are significantly influence by upstream channelization and flood control levees through Lincoln. The new bridge will safely pass the 100-year flood flows as Lincoln continues to grow.

MADISON COUNTY
BOARD OF COMMISSIONERS

DISTRICT 1	DISTRICT 2	DISTRICT 3
RONALD SCHMIDT	ERIC STINSON	TROY UHLIR
82421 549TH AVENUE	201 NORTH 9TH STREET	2703 PARKHILLL DRIVE
HUMPHREY, NE 68642	NORFOLK, NE 68701	NORFOLK, NE 68701

2024 County Bridge Match Program Proposal:

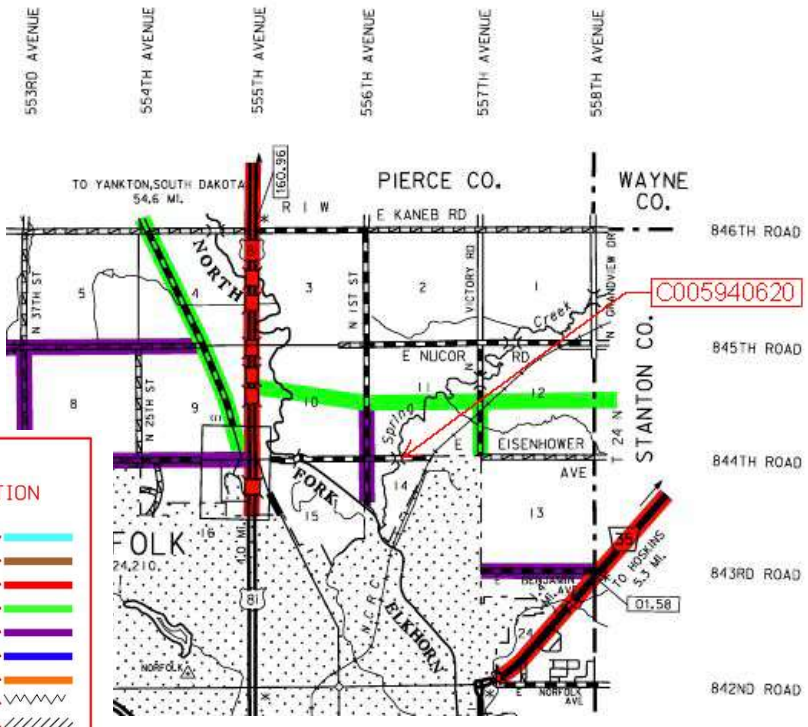
Madison County structure C005940620 is being submitted for County Bridge Match Program (CBMP) consideration.

This bridge satisfies the proposal requirements:

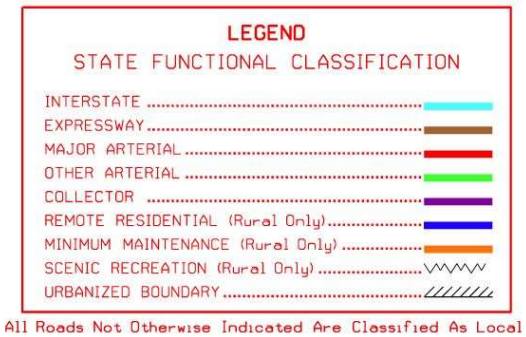
- Madison County's proposal is for a single bridge.
- C005940620 is indicated on the proposal's map of Eligible Bridges.
- The roadway is classified as "Local."
- This proposal includes the completed Application Form and Project Narrative.

A project of this size, without CBMP funding assistance, would create additional hardships for the taxpayers of Madison County. The County has replaced a significant number of bridges over the past seven years. Four bridge replacement projects are currently under contract and the plan is to replace four more next year. The use of CBMP funds, on this project, allows the County to replace another defective bridge quicker than if it has to use its own funds. The bridge replacement project, C-59(919), is currently on Madison County's 1-year Improvement Plan. The project can readily be moved to design and construction if selected for funding.

The project is located directly north of the City of Norfolk, Nebraska, more specifically, on East Eisenhower Avenue between North 1st and Victory Road, and between Sections 11 and 14 Township 24 North Range 1 West.
Latitude: 42.0618°;
Longitude: -97.4018°



Location Map



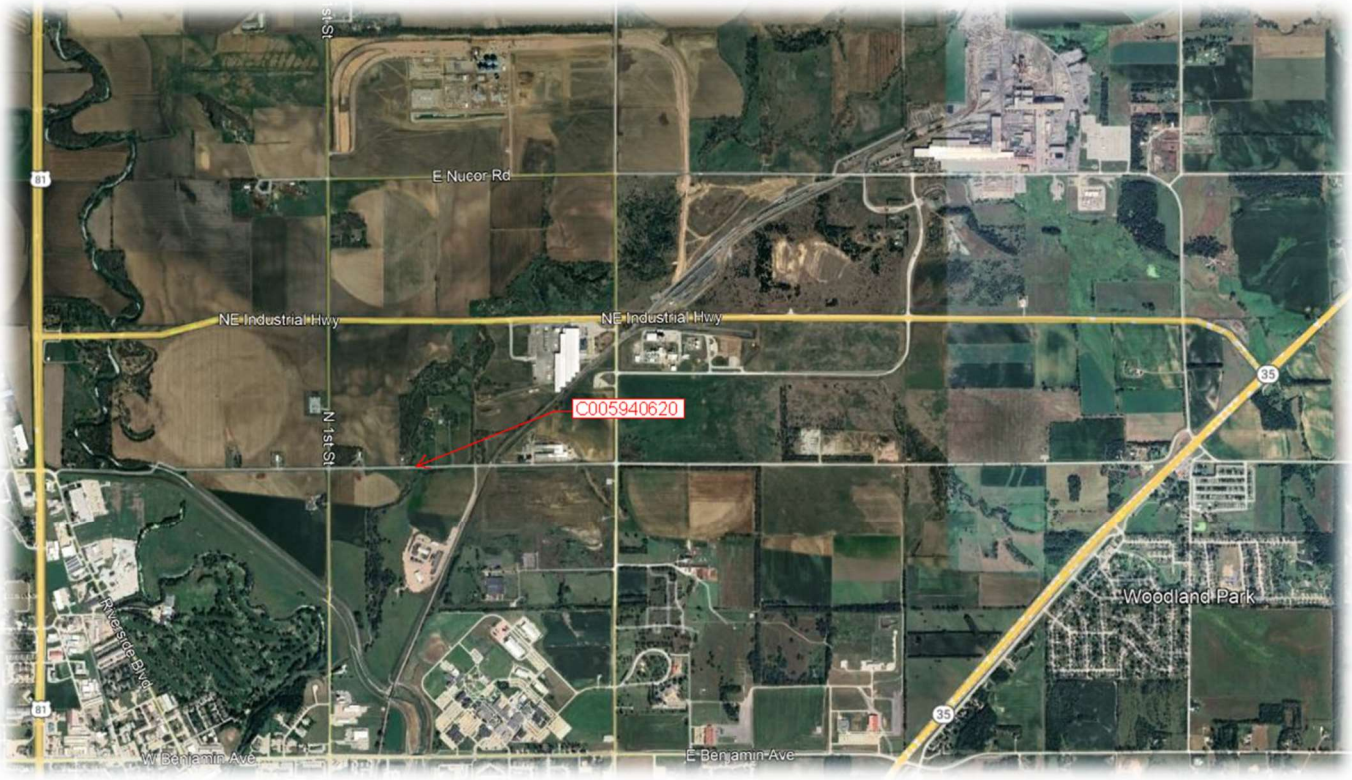
Structure C005940620 spans Spring Branch in northeast Madison County. The Structure Inventory and Appraisal (SI&A) indicates that the existing bridge is a 1-span 80-foot Steel Stringer/Girder bridge. The bridge superstructure consists of roof trusses. The deck is concrete (cast in place) with a width of 28 feet (clear roadway) and is posted 15/19/23 tons. The deck is in poor condition and will require repair or replacement in the immediate future.

Existing Structure

The bridge was one of three of the same type, built in the late 1960s or early 1970s to accommodate Nucor Steel's move to Norfolk. One bridge was replaced by Madison County in 2023, one is no longer utilized for truck traffic to Nucor, and this is the last. It is approximately 50 years old and, due to its location, has been subjected to repetitive heavy loads. Currently, due to tonnage limitations, the bridge is only open to passenger vehicle usage. It is doubtful that fire trucks (emergency) coming from Norfolk would cross the bridge due to the load restrictions.

There are two available detours. The north route is 6 miles, and the south is 4 miles. The south detour would route traffic through the City of Norfolk increasing traffic on an extremely busy city street (Benjamin Avenue). The City of Norfolk has Benjamin Avenue posted "No Trucks-Local Deliveries Only". Thus, the unregulated detour length is 6 miles.

Bridge closure or removal will have a negative impact. The community could absorb the impact; however, it will come at a cost. Emergency response times to the industrial area along Eisenhower Avenue will increase, a dead-end road will create maintenance problems, and traffic patterns will be disrupted. Industries interested in development are limited and may develop/build elsewhere.



Largely Industrial area north of Norfolk

The area to the north of Norfolk is largely industrial. Nucor Steel (in Stanton County), Norfolk Iron and Metal, and Apache Manufacturing have been in the area for 40-50 years. Elkhorn Valley Ethanol has been in operation for nearly 20 years and Helena Chemical moved into the area approximately 10 years ago. Norfolk Crush, a 380-million-dollar soy crushing plant, began operations in the fall of 2024. There are several tracts of land located along Eisenhower Avenue which would be excellent sites for new industrial development.

It is necessary for Madison County to respond to this industrial growth by improving the roads and bridges of the immediate area. The bridge directly west, Project BRO-7059(17), is scheduled to be completed in 2026. This is the final bridge replacement required to complete the infrastructure improvements. All bridges will be 10 years old, or newer, and have life expectancies into the next century. The improvements are intended to encourage additional economic growth.

The replacement structure estimate is a 3-span 100-foot Continuous Concrete Slab bridge (1-40 foot & 2-30 foot spans) on a 0° skew. The width will be 28 foot (clear roadway) with a reinforced concrete rail and steel W-Beam approach guardrail.

3-Span Continuous Concrete Slab Bridge (example).

Continuous concrete slab bridges are a cost-effective alternative for the replacement of deficient bridges in the State of Nebraska. The design and construction process are streamlined with the utilization of standard plans and construction practices with typical bridge construction completed within 120 calendar days. An experienced pool of contractors active in Nebraska results in a competitive environment, reducing replacement costs to the County. The structure is considered extremely durable and expected to require minimal maintenance over its expected lifespan (beyond 75 years). Additional savings are realized throughout the bridges' anticipated lifespan in costs associated with general maintenance and repair.

Proposed Roadway after construction of new bridge structure

Madison County is grateful for the opportunity to obtain CBMP funding in 2024. This project will replace the last bridge necessary to serve traffic in the industrial area north and east of Norfolk. Economic development in this area is a community priority. The project will directly benefit two existing industrial companies, Helena Chemical and Apache Manufacturing. These companies are located directly east of the bridge and would utilize the new bridge and roadway, immediately, as a direct truck route to U.S. Highway 81. As indicated, there are several sites along Eisenhower Avenue that are excellent sites for future industrial growth/development. Replacement of structure C005940620 will increase the ability to develop these properties and create additional jobs in the community.

Prairie Creek and Warm Slough Tributary

Structure Replacement Projects

Merrick County, Nebraska

Merrick County is located between the Platte and Loup Rivers in central Nebraska, Northeast of Grand Island. The county has a population of 7,688 with the county seat being in Central City. There are three bridges located in the southwest portion of the county that would make strong candidates to be replaced. These are Structure No. C006110710 which crosses Warm Slough on 4th Road, Structure No. C006105410 which crosses Warm Slough on Chapman Road and Structure No. C006111120 which crosses Prairie Creek on Ormsby Road. Merrick County has various challenges that are unique to this area of the state. The county is relatively flat with almost no relief between banks of creeks and adjacent upland. Historically, flooding has been an issue here, where the drainage ways were previously unable to support even moderate rainfall. To improve drainage many of the channels have been straightened. While this has improved flood concerns, attention has now been brought to many of the county's structures which are rapidly deteriorating. Listed below in Table 1 are three sites where a combination of location, importance and age make these critical structures. It is proposed to replace these structures with concrete box culverts.

Table 1 Existing Structure Information

Structure No.	Year Built	Type	Roadway Classification	Detour Length (mi.)	ADT
C006110710	1968	Timber	Local	3	50
C006105410	1949	Steel girder	Major Collector	3	400
C006111120	1936	Conc. Slab	Major Collector	3	520

These bridges are ideal candidates for CBMP funding as they are the primary market routes for agricultural goods for the southwest portion of the county. Both Chapman Road and Ormsby Road are paved major collector routes.

Structure C006110710 is load posted for 9T, 13T, and 19T. The load rating on this structure is likely to worsen as the timber components of the bridge are subject to progressive defects such as rot and decay. It would take significant effort to maintain or improve the load rating at this site with the existing structure.

Structure C006105410 is load posted for 23T. Passenger car demand is anticipated to increase as the area continues to be developed. Agricultural demand is also anticipated to increase as equipment continues to become heavier and wider.

Structure No. C006111120 is unposted, however it is experiencing scour issues that will begin to undermine the bridge. On a higher speed paved road this is of particular concern where traffic would be more likely to have a serious accident.

All three of these bridges are narrow and head-to-head traffic can be forced to slow down or stop altogether if meeting at the bridge due to the constriction especially with larger agricultural equipment. Currently the structure has some maintenance challenges such as increased inspection costs due condition ratings, as well as the load signs, object markers and guardrails frequently being damaged due to the narrow width of the bridges. The county has limited funds due to a smaller tax base. Raising funding for a major structure at all three locations would be a difficult task on their own.

Merrick County has previously preferred box culverts to replace aging infrastructure in the past. For these three sites that would be perfect approach as well. Many of the creeks in the county support significant drainage ways that carry large flood flows. However, due to the little topographic relief available and smaller existing channels, there is not much head room to go with a taller pipe, or a significant span bridge. A box culvert at these sites would help maximize the flow area at these crossings while staying within height constraints. Additionally, the proposed structures would be significantly wider than the existing bridges as well as having no legal load restrictions. This would reduce potentially dangerous driving conditions for head on traffic and would allow increased traffic on the route for agricultural equipment. Maintenance costs would be reduced as there would be less or no signs, object markers or guardrail to repair. Inspection costs would be reduced due to the ease of inspection of box culverts. The challenges in replacing the structures are reduced with box culverts as there are many are contractors familiar with this structure type that could do so at a fraction of the cost of a new bridge. A box culvert would further reduce the time the roadway would be closed to traffic. This would be important at these locations as the proposed work would need to be started/finished before planting or harvest and the roadways are heavily traveled by passenger car traffic. Long term benefits for these structures would be the durability and lifespan of a box culvert. Many box culvert structures will last over 100 years. Finally, Merrick County has been in desperate need for federal funding. Merrick County was selected for County Bridge Match Program in the first year, but has not obtained funding for the program since.

In conclusion, replacing these aging structures with reinforced concrete box culverts is a practical and beneficial solution for Merrick County. The existing structures are nearing the end of their useful life, with increasing maintenance challenges, limited load capacity, and safety concerns due to its narrow width and load restrictions. Concrete box culverts offer numerous advantages, including increased traffic capacity, improved safety for both local and agricultural vehicles, and reduced long-term maintenance and inspection costs. With the county's financial constraints in mind, the affordability and ease of construction of a box culvert make it an ideal choice. The durability and longevity of the proposed structures ensure their effectiveness for many years to come, providing lasting benefits for the community, enhancing safety, and supporting the local agricultural economy.

OTOE COUNTY ROADS

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2024 County Bridge Match Program Proposal:

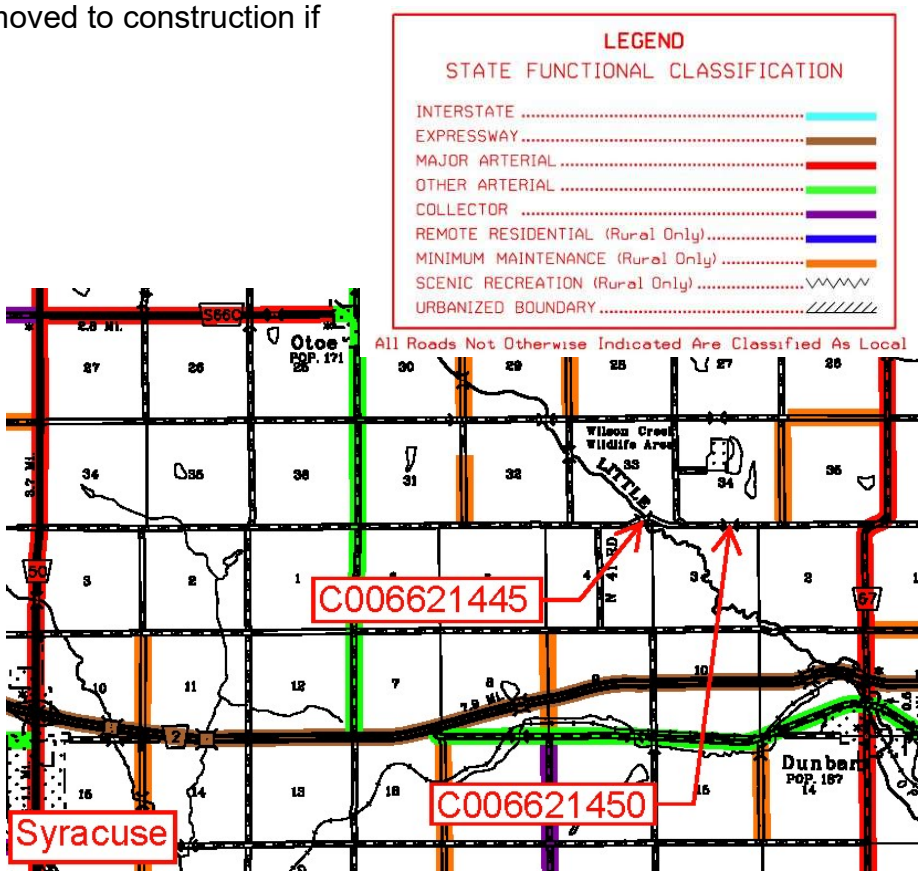
Otoe County structure C006621445 is being submitted for the County Bridge Match Program (CBMP) consideration.

This bridge satisfies the proposal requirements:

- Otoe County's proposal is for a single bridge.
- C006621445 is indicated on the proposal's map of Eligible Bridges.
- The roadway is classified as "Local."
- This proposal includes the completed Application Form and Project Narrative.

Without CBMP assistance, a project of this size would create additional hardships for the taxpayers of Otoe County. The funding will allow the County to schedule an important project, such as this, for construction without significantly affecting other budgeted priorities. The bridge replacement project, C-66(679), is currently on Otoe County's 1-year Improvement Plan. The construction plans are complete, and the project can readily be moved to construction if selected for funding.

The project is located northwest of the City of Dunbar, Nebraska, more specifically, on Road G between North 41st and 42nd, and between Sections 33/4 and 34/3 Township 9/8 North Range 12 East. Latitude: 40.6978°; Longitude: -96.0705°



Location Map.

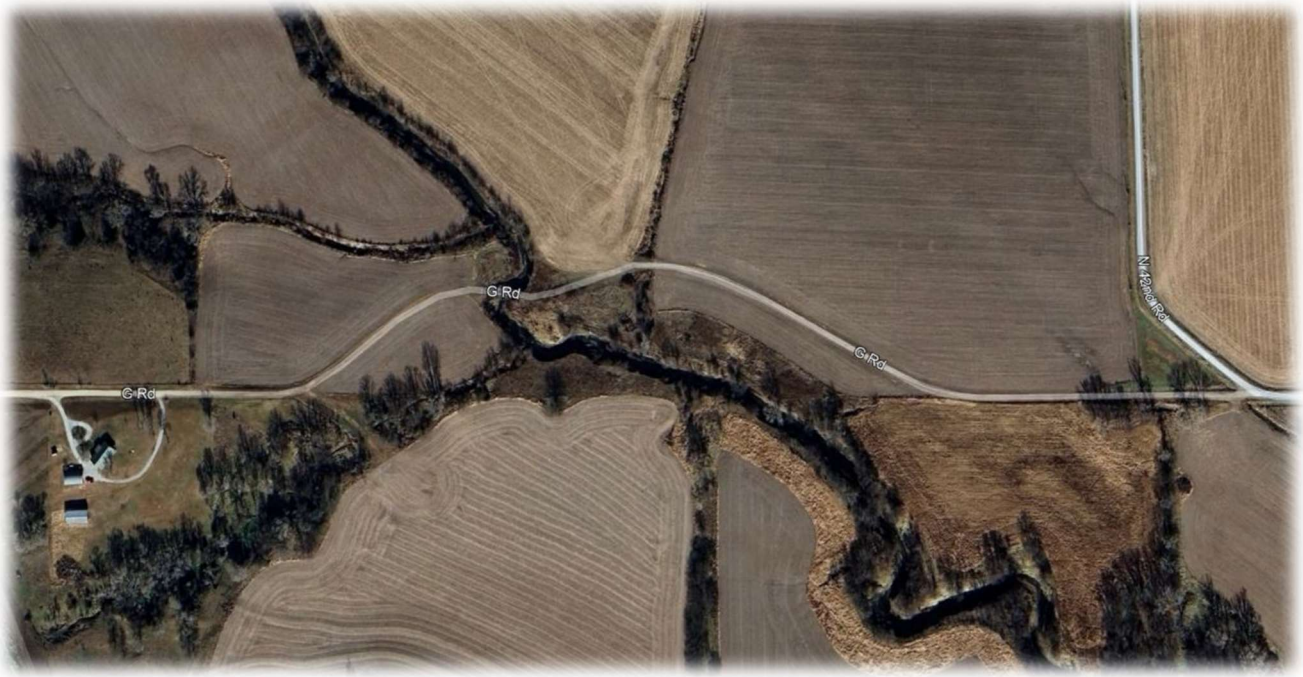
Structure C006621445 spans the North Fork of the Little Nemaha River in central Otoe County. The Structure Inventory and Appraisal (SI&A) indicates that the existing bridge is a 71-foot Steel-Truss Thru bridge with a timber deck. The clear width is 13.6 feet, and traffic is restricted to a 1-lane bridge for 2-way traffic. A Critical Findings Report (CFR) indicates that the bridge was closed in 2006. The notes indicate that flooding stressed and distorted a steel member of the truss and damaged the floor beams in the second bay. At the time of closure, the bridge was posted at 9 tons.

Existing Structure.

Prior to the closure, the residents of rural Dunbar, Otoe, and Syracuse utilized the bridge/roadway for direct access to other arterials and collector routes. Road G was one of two all-weather roads, north of Highway 2, connecting Highway 50 to Highway 67. Structure C006621450, approximately one mile east, is the only other bridge-sized structure within this segment. This structure was replaced in 2009.

The community was forced to adapt to the increase in travel time which creates an inconvenience and monetary loss for the residents of the area. The poor condition of the structure, prior to closure, re-routed the movement of goods, services, and equipment required for local agricultural and livestock production. The closure then detoured what traffic remained, including local traffic, emergency, and mail services. Depending upon the direction and destination of travel, the detour can potentially add 6 to 8 miles to the route. Low-speed, heavy agricultural equipment was forced to be re-routed to other all-

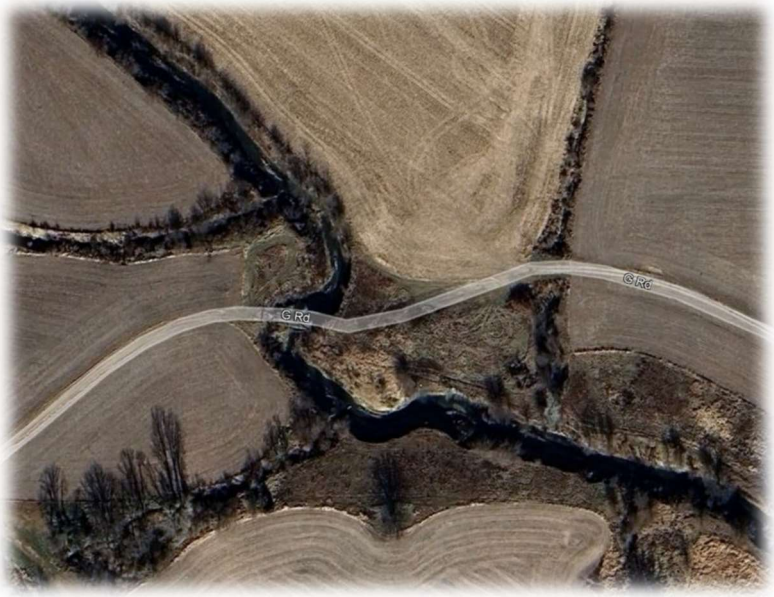
weather roads, including Highway 2, which is a safety concern at the least, possibly illegal depending on the equipment specifics.



Existing Sub-standard Roadway Alignment.

The SI&A Structural Appraisal: Approach Alignment (072) is coded 3 Intolerable – Correct. The horizontal alignment of the existing roadway is dangerous and sub-standard. Review of the existing roadway approach curves indicates design speeds of less than 15 MPH.

The SI&A Waterway Adequacy: Scour Critical (113) is coded 2 SC – extensive scour. The existing bridge is located within a series of sharp channel bends. The structure length is inadequate and localized scour, due to the sharp bends, is eroding the channel banks in the area of the bridge.



Existing Channel Configuration.

Continuous Concrete Slab Bridge (example).

The replacement structure is a 3-span 110-foot Continuous Concrete Slab bridge (1 – 44-foot and 2 – 33-foot spans) on a 0-degree skew. The width will be improved to 28-foot (clear roadway) with a reinforced concrete rail and steel W-Beam approach guardrail. Encased bents with nose angles will mitigate debris impact/collection. This bridge type will withstand submergence, which is necessary for this project.

Continuous Concrete Slab bridge contractors of the area are experienced and efficient. Bridge construction crews in Nebraska continue to streamline the construction process. The critical path includes overlap which typically reduces bridge construction to 110 through 120 calendar days. In this project, Otoe County will be performing roadway relocation grading operations concurrent to bridge construction. This approach will re-open the bridge to traffic as quickly as it is safe and practicable.

The design will meet the Nebraska Board of Public Roads and Classifications and Nebraska Minimum Design Standards.

Maintenance requirements for this type of bridge are minimal.

Proposed Alignment with new Bridge location.

The design includes relocation of the roadway to improve safety and increase the design speed to 50 MPH. The proposed bridge will be located to the north, upstream of the problematic channel bends. Type “B” rock riprap will be utilized to stabilize the east channel bank through the bridge. A tributary to the North Fork of the Little Nemaha River, located immediately east of the new bridge, will be carried through 1-84” Corrugated Metal Pipe with headwalls and wingwalls. Near the east end, the Road G and 42 intersection is substandard and a safety concern. A 3-way intersection including a stop condition on Road 42 will address these issues.

Environmental resource impacts are minimized to only what is required. Coordination with the appropriate resource agencies will be conducted as part of the project.

Otoe County would be grateful for the opportunity to obtain CBMP funding in 2024. The road and bridge have been closed for 19 years. The negative impacts to the community and residents are still prevalent. Those impacted by the closure repeatedly express their desire to re-open the roadway and bridge. The replacement bridge/relocation project will provide an all-weather roadway, accessibility to main arteries, a reduction in the response time for emergency services, a mail route, and a direct route for agricultural producers and commercial truck traffic. The project will have a positive impact on the traveling public and improve the quality of life for current residents/producers. Additionally, the proposal will provide the necessary infrastructure for future community growth.

Scotts Bluff County Roads Department
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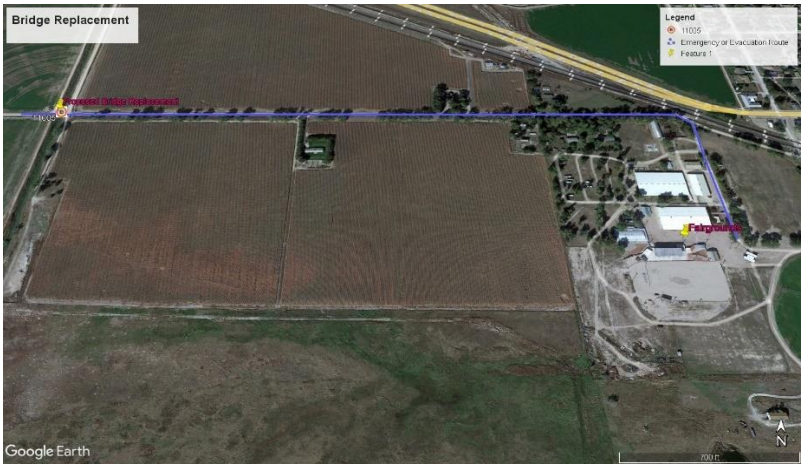
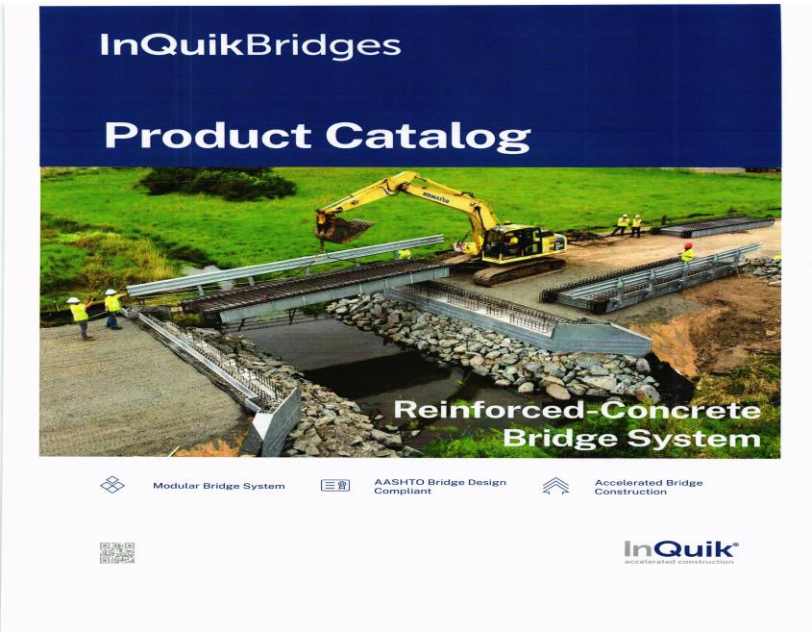
County Bridge Match Program 2024

Proposal #1: C007911005

The pictures above represent the bridge in its current form. As seen in the pictures the timber bridge is in poor condition and will require replacement. The current condition of the bridge impacts harvest trucks and the County fair participants hauling there stock to the fairgrounds with the low weight posting. Currently, the bridge is restricted in its use due to the 20 foot width, and the load posting of 5 ton. In the far right picture in the background you can see one of our sugar beet factories. The farmers in our County raise numerous acres of sugar beets and with todays size of equipment and trucks the increase in width and load rating will be a huge improvement from the current structure. Constant maintenance on the bridge includes replacing deck plank and spikes that will not hold any longer, as well as replacement of rotted stringers and piling. The cost in repairing this bridge is expensive and year after year, and we still don't have a low or non maintenance structure, it still would be a timber bridge, not providing longevity for the money spent. We believe this structure is a perfect candidate for the CBMP due to the impact it will have on our traveling public as well as the location of the structure. The picture belows show that the structure lies just west of our County Fairgrounds and the City of Mitchell and can be used as an access to the Fairgrounds without having to go through the City streets. It can also be a emergency route to and from the Fairgrounds, if a evacuation was needed at the Fairgounds this route could be utilized, being safer and quicker than trying to navigate through congested city streets during an evacuation.



Our proposed solution is a quick and innovative structure that minimizes maintenance and provides longevity. Our proposal is a InQuick modular bridge, a design that we don't believe has been utilized in Nebraska yet. Scotts Bluff County would like to be the first to utilize this design and structure in the State.



The InQuick bridge system is a conventional reinforced concrete bridge that is cast in place. However, the construction process combines the efficiency of using prefabricated components and the quality of cast in place. The abutments, wingwalls, pier caps and superstructure/deck panels are prefabricated in a factory. These structures remove tie-downs and bearings, as well as longitudinal deck joints to help minimize manintenance. No long term structural maintenance and have over 75+ year design life. These structures can usually be completed onsite in 30 days or less, helping to reduce the closure time.

With over 200 bridges in Scotts Bluff County on the NBIS, funding is always challenging. The CBMP helps our County to be able to replace and repair our bridges and keep them open. We have thirty structurally deficient bridges in our County. With the ongoing issue of property taxes in our State, County Boards like ours are always looking to make cuts to help the tax payer. The CBMP helps alleviate those cuts and enables us to continue with our projects on our bridges.

Proposal #2: C007926910




Our second proposal is a two span timber deck with steel substructure bridge. The above pictures represent the decayed deck, but also show a nice steel substructure. This bridge lies entirely in farm country and sees a lot of farm and harvest traffic. The stringers rot to the point where spikes won't hold and will need to be replaced. The low load posting detours harvest trucks to use a two-mile detour to the north. Replacing the timber is expensive, and does not help with maintenance costs, longevity or the load rating for the bridge. Once again with today's farm equipment being bigger and trucks hauling more tons to the market replacing the timber deck just isn't feasible.

Our proposal for this structure is to do away with the timber and rehabilitate the deck to concrete slabs.



The above pictures represent another structure we were able to rehabilitate using concrete slabs. By rehabilitating the deck to concrete it will help reduce maintenance costs, add longevity to the entire structure, and increase the load rating allowing harvest trucks to use the bridge. This structure, due to its location, will never see any wintertime chemicals used on it, thus helping with maintenance and longevity issues. Our County has several structures like this that we have been able to rehabilitate thanks to the CBMP. These rehabs are relatively low cost and can be completed in a few weeks, helping with closure time.

SEWARD COUNTY

BRIDGE MATCH 2024

DECK REPLACEMENT

Seward County is requesting Bridge Match Funds to replace the deck on C008011235. A project that will increase the longevity of the structure with minimal cost and disturbance to the community.

Seward County Bridge Match 2024

Basic Project Information:

Seward County, Nebraska is seeking Bridge Match Funds to replace the deck of Structure C008011235, located on Branched Oak Road East of 266th over Plum Creek. An investment of $41,250 from the County Bridge Match Program is requested to support this project. The remaining project cost will be paid by Seward County and is currently in our budget.

Structure C008011235:

This structure is a 61' Concrete Slab Bridge constructed in 1958. According to the NBIS, the condition of the deck is Poor (4), superstructure is Satisfactory (6), and the substructure is Good (7). The recommended load rating for this structure is 38 Tons, however this bridge is currently posted at 28 Tons for legal trucks, based on LARS deduction for poor deck conditions.

Since the September 2010 Bridge Inspection, there have been concerns about the cracks and spalling throughout the bridge deck. 30% of the bridge deck has been patched and repaired, as can be seen in Figures 1 and 2.

Figure 1: Concrete repair on 30% Deck

Figure 2: Top of recent deck patch, Abutment 2

According to an August 2020 Bridge Inspection the deck has 50% of defects throughout, with moderate cracks on the deck and spalling on the underside of the bridge. These defects can be seen in Figures 3, 4 and 5. The most recent Bridge Inspection in August 2024 states: “Concrete deck has heavy wear with moderate transverse and map cracking. Concrete deck has moderate spalling from below. Moderate gaps at the East end of the floor.” Figure 6 shows the cribbing between Girders 2 and 3 to reinforce the concrete patch.

Figure 3: Bridge Deck Seperation

Figure 4: Concrete spalling on underside of deck

Figure 5: Spalling at Abutment 2

Figure 6: Cribbing between Girders 2 & 3

In addition to the poor state of the concrete deck, the current guardrails do not meet NBIS Standards, as can be seen in Figure 7.

Figure 7: Guardrail does not meet standards

Deck Replacement Project:

The replacement of this bridge deck is currently on the Seward County 1- & 6-Year Road Plan, as Project C-80 (677). The project has been engineered by Mainelli Wagner and is ready to go to letting. If we are awarded Bridge Match Funds, the construction of this project can be completed by the December 31, 2026, deadline.

This project is the ideal candidate for CBMP funding, as it meets the standards of replacing a Poor Condition structure. However, since the substructure of this bridge is in good condition, by replacing the aging 'poor condition' deck we will be able to increase the longevity of the structure with minimal cost and disturbance to the community. As opposed to the high cost of an entire bridge replacement, the deck replacement is a budget-friendly way to make the structure more viable for decades to come. Also, as opposed to the disruption a full bridge replacement puts on the community, the deck replacement can be done in a manner to reopen the bridge to traffic much more quickly.

Community Impact:

Structure C008011235 is an important part of the local community. It is located on the main road between the Villages of Staplehurst and Garland, Nebraska. It is also on a Bus Route for the Seward Public School System. For community members in the Northwest section of Seward County, the structure is on the primary road to access both the Oak Glen Wildlife Management Area and Branched Oak State Recreation Area. Local Ag Producers utilize this bridge to transport their goods to the surrounding Co-ops as well as to travel between fields. The structure also serves multiple Fire and Emergency Service Departments from the surrounding communities of Staplehurst, Bee, Garland and Seward.

The load rating of the substructure on this bridge is 38 Tons, however because of the poor deck condition it is only posted at 28 Tons; this limits the traffic that can utilize the bridge causing agricultural and business producers to use different routes, which can take them miles out of the way. Added miles traveled are not only an inconvenience to citizens but creates more emissions for the environment.

The poor condition of the bridge deck is also a safety concern for the community, as it is on a well-travelled road with an average of 108 vehicles per day (based on a November 2024 traffic study).

Replacing the deck on this bridge, and bringing the guardrails up to standard, will give the residents of Northern Seward County safer and easier access to medical care, school, agriculture business, and recreation facilities. Furthermore, by replacing the deck, as opposed to a full bridge replacement, this project can be completed in a timely manner with little disruption to the community.

Summary:

The Deck Replacement of C008011235 is a shovel-ready project that can be completed within the time constraints of the County Bridge Match Program. The investment of $41,250 being requested is a minimal cost for the Bridge Match Program, however it is an enormous benefit to Seward County who, as a primarily agricultural county, does not have a large budget to fund road projects.

468th Ave Bridge Replacement Project

Valley County, Nebraska

468th Ave Bridge Replacement Project

The bridge is located at the intersection of 468th Ave and Hawthorne Creek in Valley County, Nebraska. The creek is ephemeral and runs during rainfall events. The existing structure is a timber deck, super and substructure that was built in 1986. Currently it is load posted at 14T, 21T, and 31T. The adjacent land use is agricultural with a residence nearby. The road serves as a minor collector route with moderate traffic. Valley county has of population of 4,059 as of the last census and the area is agriculturally based with the nearest village being Arcadia 4 miles to the southwest. A significant portion of the traffic the bridge sees is agricultural equipment. The structure is proposed to be replaced with a Twin 120' arch corrugated metal culvert pipe.

This bridge is an ideal candidate for CBMP funding as the structure serves as a market route for the SW portion of the county. The route also serves school traffic to Arcadia. Due to the load restrictions on this structure, overweight agricultural traffic detours 1 mile. The structure is also relatively narrow at less than 24' wide, which forces approaching head on traffic to slow down as they approach or wait for farm equipment to pass. It is also likely the load rating of the structure will continue to worsen. The timber components of this bridge are prone to progressive defects such as rot and decay that are likely to get worse as this structure ages. The structure appears to be nearing the end of its useful life and major repairs or rehabilitation would be necessary to keep the existing structure in place and maintain or improve the load rating. Currently the structure has some maintenance challenges such as the load signs, object markers and guardrails frequently being damaged due to the narrow width of the bridge. The county has major financial barriers towards replacing the structure as there is limited funds due to a smaller tax base. Raising funding for a major structure at this location would be a difficult task on their own. Finally demand for this structure is projected to increase from a ADT of 155 to a future ADT of 263. A projected increase in use of over 100%

A corrugated metal pipe culvert at this location would be a great fit for this part of the county for a variety of reasons. It would be significantly wider than the existing bridge as well as having no legal load restrictions. This would reduce potentially dangerous driving conditions for head on traffic and would allow increased traffic on the route for agricultural equipment. The proposed structure is sized so that object markers would not be necessary at the approaches, this would also increase safety as the existing markers are often knocked down by wider equipment as they pass over the structure. Maintenance costs would be reduced as there would be less or no signs, object markers or guardrail to repair. Inspection costs would also be reduced due to the ease of inspection of pipe culverts. The challenges in replacing the structure are reduced with a pipe culvert as there are many contractors and fabricators familiar with and would be able to complete the work and could do so at a fraction of the cost of a new bridge. A pipe culvert would also reduce the time the roadway would be closed to traffic. This would be important at this location as the proposed work would need to be started/finished before planting or harvest. Long term benefits for this structure would be the durability and lifespan of a pipe culvert. Many pipe culvert structures will last over 50 years. Overall, the benefits discussed make a corrugated metal pipe culvert a best fit option for the community and site.

In conclusion, replacing the aging timber bridge with a Twin 120” arch corrugated metal pipe culvert is a practical and beneficial solution for Valley County. The existing structure is nearing the end of its useful life, with increasing maintenance challenges, limited load capacity, and safety concerns due to its narrow width and load restrictions. A pipe culvert offers numerous advantages, including increased traffic capacity, improved safety for both local and agricultural vehicles, and reduced long-term maintenance and inspection costs. With the county's financial constraints in mind, the affordability and ease of construction of a pipe culvert make it an ideal choice. The durability and longevity of the proposed structure ensure its effectiveness for many years to come, providing lasting benefits for the community, enhancing safety, and supporting the local agricultural economy.

Nebraska County Bridge Match Program 2024

Proposal By: Washington County, Nebraska

November 22nd, 2024

Structure C008904305P

Introduction to Our Structure:

Structure C008904305P is a 70'-0" pony truss located just north of Fort Calhoun. The structure was built nearly 100 years ago and boasts the following attributes:

- Weight Restricted
- Deck Condition, 4 Poor
- 18'-0" Clear Roadway, Approach Road 20'-0"
- Poor Roadway Alignment (Item 072, 4 – Minimum Tolerable)
- Non-Redundant Steel Tension Members

What It Means to Our Community:

There are many structures throughout the state of Nebraska which may rival the condition of the proposed bridge replacement. However, the concern of our community is the proximity of this structure to the City of Fort Calhoun, and more importantly Fort Calhoun Public Schools. Although this structure is utilized daily by mail carriers, and citizens, it also routes many young drivers attempting to cut a path to school without driving through the city, and school event participants trying to beat traffic.

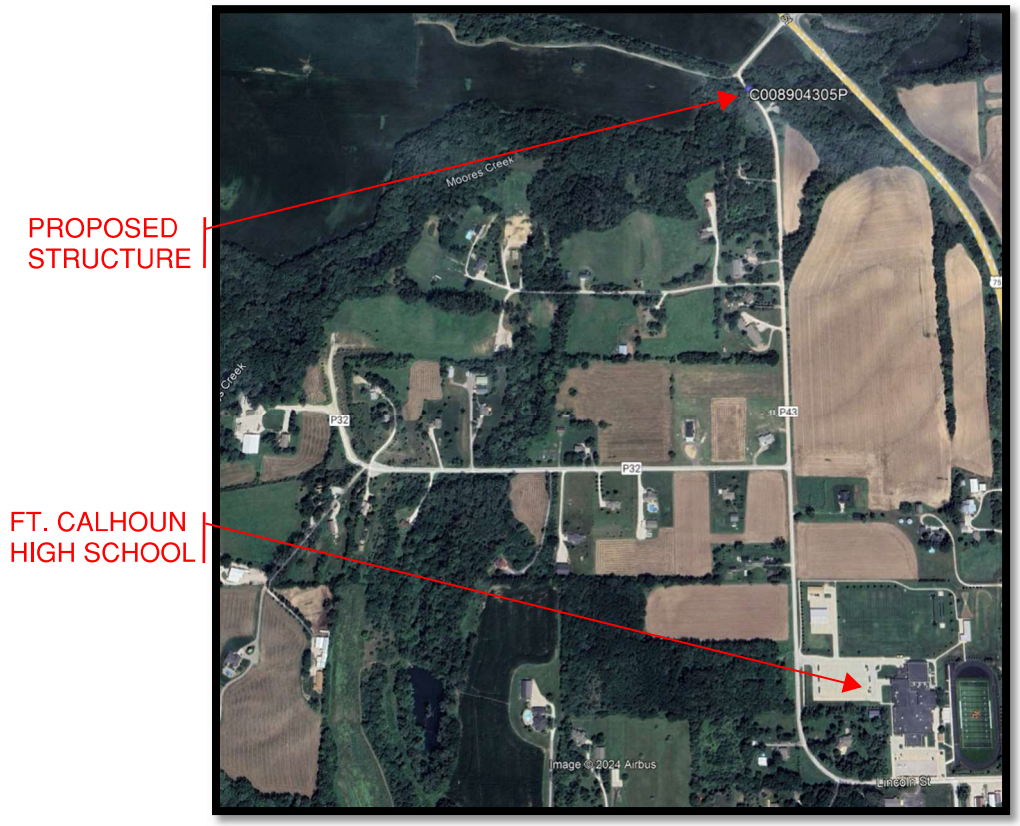


Photo 1: Map Showing Structure Location and Fort Calhoun High

Challenges Regarding the Existing Structure:

The Structure's existing deck is in dire need of replacement, something that today's County forces do not have the crew power to complete.

Photo 2: 2024 Deck Surface With Large Failing Patches

Photo 3: 2024 Deck Spalling at Underside With Exposed Rebar

Deck maintenance is no longer a feasible long-term strategy. Deck replacement will not help the fact that the structural steel is failing, and the foundation condition is well past service life.

Structural steel elements throughout the bridge are also deteriorating and our forces, again, do not have the machines or knowledge to repair them.

Photo 4: Lower Chord Deterioration

Photo 5: Gusset Plate Deterioration at Bearings

Replacement of these deteriorated steel members require cranes, chains, and knowledge that our existing work force simply does not have. Further challenges include large peak traffic volumes from events and school start and end. Dust from the gravel road is unavoidable at this time, however removing the narrow steel structure on a poor alignment may be a step in the right direction to provide safety to our youth drivers and citizens.

Challenges of Replacement:

The existing roadway is a narrow corridor with large trees and poor horizontal alignment. Minor realignment will likely be necessary, meaning right-of-way purchasing and clearing and grubbing will all add to the replacement costs of this structure.

Innovation:

Although continuous slab bridges may not be new to the bridge scene, they are undoubtedly a work horse in any County inventory, leading to low maintenance cost, handling of larger storm events well, and increased safety with approach rail, concrete bridge rail, and a smooth ride. What's not innovative about that?

Conclusion and Positive Impacts:

In conclusion, we are aware there may be other structures in worse condition than our proposed bridge replacement. However, we strongly encourage the CBMP Working Group to consider the impact this structure has on the safety of our state's traveling citizens, but more concisely, the impact the safety of this particular structure will have on our youth today, tomorrow, and for the service life of this bridge crossing.

Photo 5: Looking North at Bridge and Alignment

Thank you very much for your consideration!!

-Washington County Roads Department