United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in National Register Bulletin, How to Complete the National Register of Historic Places Registration Form. If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions.

1. Name of Property
   Historic name: William H. Murray Bridge
   Other names/site number: Bridgeport Bridge; Pony Bridge; US 281 Bridgeport Bridge; #09020000X/NBI 04085
   Name of related multiple property listing:
   Route 66 and Associated Historic Resources in Oklahoma” Multiple Property Listing (1995); “Historic Properties Associated with U.S. Highway 66, from Chicago to Santa Monica, 1926 to 1985” Multiple Property Documentation Form (2011.(Enter "N/A" if property is not part of a multiple property listing)

2. Location
   Street & number: _N. U.S. Highway 281 over the South Canadian River
   City or town: Bridgeport___ State: Oklahoma__ County: Caddo
   Not For Publication: _x__ Vicinity: ___

3. State/Federal Agency Certification
   As the designated authority under the National Historic Preservation Act, as amended,
   I hereby certify that this _x__ nomination ___ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60.
   In my opinion, the property _x__ meets ___ does not meet the National Register Criteria. I recommend that this property be considered significant at the following level(s) of significance:
   _x__ national ___ statewide ___ local
   Applicable National Register Criteria:
   _x__ A ___ B _x__ C ___ D

__________________________
Signature of certifying official/Title: Date

__________________________
State or Federal agency/bureau or Tribal Government

In my opinion, the property ___ meets ___ does not meet the National Register criteria.

__________________________
Signature of commenting official: Date

__________________________
Title: State or Federal agency/bureau or Tribal Government
4. National Park Service Certification

I hereby certify that this property is:

___ entered in the National Register
___ determined eligible for the National Register
___ determined not eligible for the National Register
___ removed from the National Register
___ other (explain:) ____________________

______________________________   ____________________
Signature of the Keeper             Date of Action

5. Classification

Ownership of Property

(Check as many boxes as apply.)

Private:  

Public – Local  

Public – State  X

Public – Federal  

Category of Property

(Check only one box.)

Building(s)  

District  

Site  

Structure  X

Object  

Sections 1-6 page 2
**William H. Murray Bridge**

**Caddo, Oklahoma**

**Name of Property**

**County and State**

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Number of contributing resources previously listed in the National Register: **1**

6. **Function or Use**

**Historic Functions**
(Enter categories from instructions.)

**TRANSPORTATION: Road-related**

________________________________________
________________________________________
________________________________________
________________________________________
________________________________________

**Current Functions**
(Enter categories from instructions.)

**TRANSPORTATION: Road-related**

________________________________________
________________________________________
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7. Description

Architectural Classification
(Enter categories from instructions.)
OTHER: Camelback pony truss

Materials: (enter categories from instructions.)
Principal exterior materials of the property: STEEL

Narrative Description
(Describe the historic and current physical appearance and condition of the property. Describe contributing and noncontributing resources if applicable. Begin with a summary paragraph that briefly describes the general characteristics of the property, such as its location, type, style, method of construction, setting, size, and significant features. Indicate whether the property has historic integrity.)

Summary Paragraph

The William H. Murray Bridge over the South Canadian River is a 3,944.33'-long, 40-span structure made of 38 riveted Camelback pony trusses flanked by single steel I-beam spans at the approaches (Photograph 0001). With its truss section measuring 3,800’, it is the longest Camelback pony truss bridge in the United States. Once carrying U.S. Highway 66, the bridge sits at the extreme northeast corner of Caddo County, roughly between the towns of El Reno and Hydro, in West-Central Oklahoma. The bridge is currently a contributing resource to the National Register of Historic Places titled Bridgeport Hill-Hydro Route 66 Segment that is significant at the local level.

Erected in 1932-33 by the Kansas City Bridge Company, it is made of 38 standard plan 100’ Camelback pony truss spans approached by 36’ I-beam spans. The truss spans rest on reinforced concrete two-column piers, on caissons driven deep into the bedrock. The bridge provides two lanes of traffic over a 24’ concrete deck. Crossing the river at a northeast-southwest skew, it carries U.S. Highway 281 and Oklahoma State Highway 8 over a broad floodplain with steep bluffs on each side. It serves as a vital passage, connecting local and regional transportation to

1 The bridge is identified as 3,937.00’ long in the Oklahoma Department of Transportation inventory.
Interstate 40 to the south. The bridge’s setting is rural, surrounded by small farms and grazing land; there is little development.

The William H. Murray Bridge retains a high degree of historic integrity, with the majority of its components original and revealing only normal wear. Dedicated on July 17, 1934, the $450,656² bridge completed a long-held goal to straighten Highway 66 across Western Oklahoma. It was, and remains, the longest free bridge on historic Highway 66.

### Narrative Description

#### Setting

The long, golden yellow bridge crosses a wide floodplain of the South Canadian River, a meandering, shallow waterway making a slow west-to-east journey across Oklahoma. Positioned purposely at a skew, it spans one of the river’s many exaggerated loops. Because of its low position to the water, drivers hardly realize they are crossing a major river. Instead, the up-and-down rhythm of the humpbacked trusses directs their attention forward. But below are shifting sand dunes, and, on each bank beyond the dunes, a forest of cottonwoods and willows. The bridge is approached by a descent from the west, moving swiftly down a plateau to the river. On the opposite side is a small valley framed by rolling red hills (Photographs 0002 and 0003).

#### Design

The William H. Murray Bridge is built after a standard design developed by the Oklahoma State Highway Department in 1932. The five-panel configuration follows the Camelback truss system (Photograph 0004). A variation of the Parker truss, the Camelback has a polygonal upper chord fabricated as five angles. The “camel” part of the name references its hump-shaped appearance. The “pony” indicates that it has no lateral bracing at the top. The hybrid truss has superior tensile strength and could be constructed with riveted joints, making it suitable for heavy highway traffic.

The upper chord of the truss, with its unique five-angle form, is made of two 15” channel beams.³ These beams, along with other rolled steel members, were fabricated by the Illinois Steel Company in Chicago. The beams connect at the top with a continuous flange plate affixed with stitched rivets (Photograph 5). The channels and plates create a composite section carrying the

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² This figure includes the cost of the 1.6 miles of concrete roadway approaching the bridge. The final figure for the bridge structure is $377,448.55.

³Dimensions are based on the 1932-34 Oklahoma Department of Transportation standard plan drawings for the 100’ Camelback pony truss span, the 1932 bridge project plan, and details discussed in Oklahoma State Highway Commission and Bureau of Public Roads correspondence. The dimensions of the constructed bridge may differ slightly from measurements presented in archival documents.
bridge’s compression load. The same beams connect underneath with lacing bars. Made of narrow, thin steel plates, the bars are arranged in a laced pattern to strengthen the upper chord.

The various pieces of the upper chord are riveted with four-row connecting plates. All rivets are of the rounded, button-head type.

The truss web is composed of shallow, 10” I-beams arranged as four verticals and three diagonals (Photograph 6). These attach to the chords with rivets. In contrast to the top plate, the web members are small in dimension, and work to lighten the visual weight of the bridge.

Two 12” channel beams, connected by riveted stiffeners and in some sections lacing bars, create the bottom chord. The stiffeners are arranged at regular intervals to prevent buckling. The bottom chord meets the piers with either a single or double shoe, and at expansion points with an expansion shoe containing a steel pin. The shoes sit on steel bearing plates.

The individual truss spans connect to each other with V-shaped gusset plates. These plates support the deck girder and connect the railing posts. They are welded to each end post and stiffened with rivets.

The bridge supports a 26’-wide deck, slightly wider than the standard of the time. The cast-in-place concrete deck sits directly on five steel I-beams. The outside beams have a deeper depth and butt against the bottom of the curbs. The deck stringers are supported by large, 30” floor beams (Photograph 7). They connect to the I-beams at angled plates. Lower lateral bracing is provided by small L-beams, arranged in an X pattern below the stringers. The bracing suspends from the center stringer by a slender hanger rod.

The 24’-roadway is paved with several layers of asphalt, and flanked by low, 12”-wide concrete curbs. Cast-iron drains, or weep holes, penetrate the curbs at intervals. These provide a quick exit for water dumped onto the road during heavy rain. The deck’s outside edge is shaped into a fascia.

A steel guard rail runs continuously along the bridge’s truss section. With a total height of approximately 3’, it is made of two parallel sections of 6” H-beam finished with a curved end detail. The “H-Rail” is riveted directly into the truss members and terminates at each end with an H-beam post. It is set back 6” from the curb, in response to a request made by the federal Bureau of Public Road during its design. The curb and railing, with their strong horizontal lines, contrast with the rounded shape of the trusses.

Substructure

The substructure, while simple in appearance, performs a major duty supporting the bridge in a shifting, quicksand-based environment. The design of the piers proved challenging — especially the subsurface caissons. The pneumatic caisson design, originally suggested by the Bureau of
Public Roads, proved to be an additional expense, but was required for the riverbed’s difficult geology.

The truss section is supported by 39 reinforced concrete column type piers (Photograph 8). Based on a standard design, each so-called “dumbbell” pier has two columns joined by a concrete web. The board-formed, cast-in-place columns are crowned with 5’-3” diameter caps outlined with chamfered edges. Below the caps, the columns taper to a 4’-6” diameter. Depending on their position, they range in height between 11’-6” and 14’-6”.

With a construction joint, the columns attach to concrete bases sunk deep into the bedrock. These shafts extend as much as 60’ into the stream substratum. Responding to another recommendation of the bureau, most were filled with dry concrete by the pneumatic method. The bases terminate as box-shaped ends, anchoring into the bedrock.

**Approach Spans**

The bridge is approached at each end by a single span of 36’ I-beams (Photograph 0009). At the connecting side, the I-beams share a concrete pier with the adjoining truss. At the embankment, the I-beams rest on standard design concrete abutments and supported by untreated timber piles. The bureau suggested the lighter abutment design, anticipating that, should the river ever tear away at the banks during a flood, it would be easier to extend the bridge with additional spans without the complication of a heavier abutment. The short approach spans are flanked by standard a concrete-post-and-rail guardrail integrated into the curb (Photograph 0010). A dedication plaque is affixed to the end panels on each side of the bridge. The plaque’s text highlights the bridge’s length, date of construction and the date of acceptance by the Oklahoma State Highway Commission.

**Integrity**

The nearly 90-year-old bridge shows typical wear for its age. This includes moderate rusting at connection plates, structural members, and the steel railing; much of this appears to be due to low maintenance and lack of periodic painting. Several truss members facing the roadway show damage from collision impact. Other wear on the deck side involves isolated areas of vehicle impact and spalling at the concrete approach span rails. The underdeck on the south end exhibits similar wear. Stiff leg beams have been inserted between the pier webs and the floor beams to provide additional support.

Under contract with the Oklahoma Department of Transportation, a private engineering firm gave the bridge a 21.1 out of 100 rating in the latest (2019) bridge inspection report, deeming it structurally deficient. Some of the bridge’s design elements do not meet current standards.

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especially when, as observed in the bridge inspection report, subjected to “numerous overweight vehicles.” In response, the Oklahoma Department of Transportation has lowered the weight limit from a 15- to 9-ton load.

Regarding National Register integrity, the bridge demonstrates a high level for each of the seven aspects. Its location is indisputably unchanged, and its setting is unblemished by modern development. While the immediate environment is far more wooded than when the bridge was constructed, the overall landscape — consisting of the river, floodplain, and adjacent agricultural landscape — is little changed. The bridge’s design and materials appear to be all original and evoke its engineering era and construction period. While workmanship is not particularly relevant to a standard design highway bridge, the careful riveting and connection plate attachments reveal great attention to detail and craftsmanship. Given the retention of the above aspects, the bridge impressively communicates its technology and history, having the ability to evoke a strong association and feeling for road-building in the 1930s, within the specific context of U.S. Highway 66.

5 Ibid.
8. Statement of Significance

Applicable National Register Criteria
(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)

☐ A. Property is associated with events that have made a significant contribution to the broad patterns of our history.

☐ B. Property is associated with the lives of persons significant in our past.

☐ C. Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.

☐ D. Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations
(Mark “x” in all the boxes that apply.)

☐ A. Owned by a religious institution or used for religious purposes

☐ B. Removed from its original location

☐ C. A birthplace or grave

☐ D. A cemetery

☐ E. A reconstructed building, object, or structure

☐ F. A commemorative property

☐ G. Less than 50 years old or achieving significance within the past 50 years
Areas of Significance
(Enter categories from instructions.)
TRANSPORTATION
ENGINEERING

Period of Significance
1933-1962

Significant Dates
1933; 1934; 1959; ___
1962

Significant Person
(Complete only if Criterion B is marked above.)

Cultural Affiliation
_N/A

Architect/Builder
Oklahoma State Highway Department; designer
Kansas City Bridge Company, builder
Statement of Significance Summary Paragraph (Provide a summary paragraph that includes level of significance, applicable criteria, justification for the period of significance, and any applicable criteria considerations.)

The construction of the Bridgeport Bridge, later retitled the William H. Murray Bridge⁶, challenged the Oklahoma State Highway Commission because of its difficult crossing and tension between the Bureau of Public Roads over routing and design. During an arduous period of negotiations, with its funding at one point nearly halted, the highway agencies devised a mutually acceptable plan that could withstand the river’s vagaries with an eye toward economization. The most appropriate technology was selected to meet this need — a series of 38 identical standard Camelback pony truss spans, erected over concrete piers sitting on pneumatic foundations. Completed in 1933 at 3,944’, it was Oklahoma’s longest bridge, the longest toll-free crossing on U.S. Highway 66, and the longest example of its type in the United States. Its recommended period of significance is 1933 to 1962. The bridge is currently a contributing resource to the National Register of Historic Places nomination titled Bridgeport Hill-Hydro Route 66 Segment (NRIS #04000129) that is significant at the local level.

Eligibility Statements

The William H. Murray Bridge exceeds the requirement of the property type, Road Bridge, outlined in the “Route 66 and Associated Historic Resources in Oklahoma” Multiple Property Listing (1995) and the national “Historic Properties Associated with U.S. Highway 66, from Chicago to Santa Monica, 1926 to 1985” Multiple Property Documentation Form (2011).

The bridge is eligible at the national level of significance under Criterion A, in the area of Transportation. It came as the result of a state and federal goal to improve Highway 66 by removing inefficient alignments and toll bridges. The bridge was the pivotal piece of the El Reno Cutoff, a program to straighten Highway 66’s route across Western Oklahoma. Negotiations between the state and the bureau over its siting and design highlighted the tension over the use of federal-aid in Oklahoma. Its construction represented one of the most significant tests of state and federal cooperation. The eventual opening of the bridge in 1934 completed the improvement of U.S. Highway 66 in Oklahoma and had a far-reaching effect on the national highway.

The William H. Murray Bridge is additionally eligible at the national level of significance under Criterion C, in the area of Engineering, as an exceptional example of a practical spanning technology applied to a difficult river crossing. It employed a newly designed standard plan and used a substructure system that had, until then, little use in Oklahoma. At the point of its construction, it was the most expensive and longest bridge in Oklahoma. When completed, it was

⁶ The bridge was originally to be named in honor of state highway commissioner Sam Hawks, who did much to push for its construction, but his name became affixed to another structure. The bridge received its current name after former Governor William H. Murray died in 1956.
the longest state-built bridge on U.S. Highway 66. Outside of its association with the highway, it is the longest and arguably best example of a Camelback pony truss bridge in the United States.

**Narrative Statement of Significance** (Provide at least one paragraph for each area of significance.)

The history and significance of U.S. Highway 66 are well established in the Oklahoma and national contexts for the highway. The following text does not repeat this history but works to establish the specific areas for which the William H. Murray Bridge is being nominated.

**TRANSPORTATION SIGNIFICANCE**

The William H. Murray Bridge played a pivotal role in modernizing U.S. Highway 66’s alignment in Oklahoma, which connected to a federal effort to make the national highway more efficient. The streamlined routing was critical to building Highway 66, a major east-west U.S. highway connecting the Midwest to the Pacific Coast. Crossing the South Canadian River became a significant obstacle in this ambition. The difficulty was twofold: an uncooperative river, and a statewide political culture that favored toll bridges and inefficient routings over national transportation objectives. When opened for traffic in 1934, the William H. Murray Bridge had successfully surmounted both challenges. It would facilitate efficient transit for Highway 66 over one of the crucial river crossings on its eight-state route, resulting in increased interstate traffic and spurring multi-state economic growth.

**An Uncooperative River**

The Canadian River, one of America’s major waterways, begins in the Colorado mountains at a headwater approximately 9,600’ above sea level. Here, it starts its nearly 906-mile journey, traveling in a general east-southeast direction toward Arkansas. After passing through New Mexico, moving through three dams, it flows across the Texas Panhandle toward Oklahoma.

It enters the Sooner State at Roger Mills and Ellis counties, making an oxbow around Antelope Mountain. In Oklahoma, the river is nourished by the North Canadian, Deep Fork, and Little rivers, and numerous creeks and streams. The looping waterway, which Oklahomans call the South Canadian, continues across Dewey County before it makes a distinct turn southeast at Taloga. It flows in this direction across rolling prairie for nearly 50 miles before straightening near Hydro, where it shifts eastward toward Bridgeport.

Above the William H. Murray Bridge, it widens and meanders again in a southeast direction, skirting below Oklahoma City. From there, it turns in a south-southeast direction, and after passing above Ada, spools into a series of oxbows moving northeast. After separating McIntosh

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7 In Oklahoma, the river goes by the name of South Canadian River, to distinguish it from the North Canadian River that flows into it.
and Pittsburg counties, it flows into Lake Eufaula, a human-made reservoir, eventually meeting its parent river at the Robert S. Kerr Reservoir, 40 miles west of the Arkansas border.

Known to Spanish explorers as the *Rio Buenaventura* and the *Magdalena*, the South Canadian River was an essential source of water and navigation for Native communities. Its dependable stream nourished vegetation in parts of the state that are marked by arid conditions. Starting with the Spanish, it became a conduit of conquest, with its course formally establishing a westward migration route after Major Stephen H. Long’s 1819-20 expedition.\(^8\)

Its overall southeast alignment proved a convenient boundary, dividing the territory into north and south sections. As such, it became a dividing line between various Native treaties, serving, for example, as the north-south demarcation between Creek-Seminole and Choctaw-Chickasaw lands. Before the Land Run of 1889, it formed the southern edge of the Unassigned Lands. During territorial and statehood, it helped to delineate county lines.\(^9\)

During each period, the South Canadian thwarted east-west transportation, with its shifting quicksand-lined course proving inhospitable to the construction of stable crossings. The Oklahoma State Highway Commission acknowledged this, finding that it “constitute[d] a major impediment to free travel between the North and South sections of the State.”\(^10\)

With its indefinite channel, the uncooperative river could wreak havoc, wiping away riverside developments and bridges during heavy rain. Before dams were built in the 1930s, a storm in New Mexico could send floodwaters hundreds of miles downstream. On October 15, 1928, the Rock Island Railroad, whose crossing at Bridgeport had been damaged by multiple floods, warned of a mountain storm in New Mexico sending a 12’-high wave toward Oklahoma.\(^11\)

The river’s course near Bridgeport proved especially troublesome, being subject to numerous washouts. It was no place to build a bridge for a national highway.

**The First Bridge**

A thorny issue halting the completion U.S. 66 across Oklahoma was the Key Bridge, a tottering private toll span crossing the South Canadian River near Bridgeport. Named after George D. Key, an Oklahoma City businessman and politician, it was one of dozens of toll bridges in Oklahoma thwarting interstate traffic.

Opened on December 16, 1921, the 1,000’ cable suspension bridge was considered a marvel of its time, providing passage over a river that had stymied transportation. Governor James B. A.  

\(^9\) Ibid.  
Robertson, and a crowd estimated at 3,000 to 5,000 arriving from all corners of Oklahoma, attended its dedication. At the ceremony, a young woman gave a short speech. Her words captured the mood of many, stating that bridging the “treacherous Canadian” had brought “joy and comfort to thousands of good people, too long separated by shifting sands, changing channels and high waters.” A local paper reported that since 1893, three wagon bridges had washed away, and told of damage to a nearby railroad crossing. Seasonal cycles of flooding had wreaked havoc on any bridge using pilings to cross the river.

But toll spans were not always embraced by the highway commission or those hoping to build interstate roads. A backlash against toll bridges began in Oklahoma in 1924, coinciding with the reorganization of the highway department. From that point on, the highway commission agitated for the construction of free bridges, hoping to replace the monopolies overseen by Key and others. Private bridges across the United States created similar stumbling blocks to highway progress. Governor Huey Long took on toll bridges in Louisiana as one of his crusades. Oklahoma would follow a similar path fighting for free traffic, with Governor William H. Murray, the bridge’s namesake, taking up the cause.

Construction of private bridges was not in itself a sin. Many developing states, including Oklahoma, did not have the financial wherewithal to erect expensive bridges, especially longer structures over rivers. That’s when investors such as George Key stepped in and pooled their money, forming syndicates to build bridges. Key, the chairman of the Democrat Central State Committee, owned not only the bridge bearing his name but also several others across the state. While the Federal Aid Road of Act of 1916 prohibited the use of government money to construct toll roads, existing private bridge lines became a nagging problem, as “speculators controlled most existing or potential sites” for new crossings.

Using federal aid, Oklahoma began purchasing private bridges in 1926. Backed by the highway commission, the department initially targeted toll bridges spanning the Red River between Oklahoma and Texas. At the time, the river was choked with 19 private toll spans, several taking captive alignments that were critical to developing U.S. Highways. Because of their unique locations, some remained on U.S. highways for years despite federal complaint.

Complaints about the Key Bridge began in 1926, soon after the public learned of the routing for U.S. Highway 66 in Oklahoma. Despite the highway department’s purchase of toll spans, Key and others continued to hold vital crossings on U.S. Highways 66, 75, 77, and 81, restraining the free flow of interstate traffic in every section of Oklahoma. Key, allied by Canadian County commissioners, worked to have the highway alignment move from El Reno west in an illogical looping course to meet his bridge. In addition, he held a 21-year contract with Blaine County to

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12 “‘Key’ Bridge Opens New Era in Road Building,” Hinton Record, December 22, 1921: 1.
operate the bridge. He charged a dollar (in today’s dollars, approximately $15) to drive over the river.

The Oklahoma State Highway Commission took decisive action on the Key Bridge, voting unanimously at their April 13, 1926 meeting to “guarantee to cause the freeing of the bridge by purchase, condemnation, or otherwise, prior to the date of completion of State Highway 3 [Highway 66] between the town of El Reno and Clinton.”15 While a decision had been rendered about its fate, the continued reliance on the Key Bridge stymied development of a straight east-west route for Highway 66 across Oklahoma. The inconvenient routing, derisively called a “loop” by critics, continued to block efforts to build a modern crossing over the South Canadian River.

Scrutiny of the Key Bridge intensified in 1928, when U.S. 66 between El Reno and Geary (the town closest to the Key Bridge using the so-called loop route) was approved for paving. An editorial in the Oklahoma City Times decried the estimated $500,000 it would cost to extend the road 23 miles northwest to reach the Key Bridge. The writer complained that creating the detour would condemn Highway 66, the “nationally advertised trans-continental route from Chicago to Los Angeles,” to a “round-about course thru [the] western half of Oklahoma to carry it over the Bridgeport toll bridge.”16 The writer concluded that tourists would be surprised by the “privilege of crossing a long, rickety wooden bridge, fed from the east and west state and federal paved highways.”17

The argument against paving to the bridge soon galvanized into what would be called the El Reno-Bridgeport Cutoff (later the El Reno Cutoff), an attempt to remove Key’s bridge and straighten Highway 66 across Western Oklahoma. Despite protestations from highway groups, the project improved the road right up to the east approach of the Key’s moneymaker.18

The Toll Wars

The following year, state legislators took on the toll bridge issue, passing two laws supporting the construction of free highways and denying the extension of charters for existing toll operators.19 The new rules were met almost instantly by injunctions filed by private bridge owners against proposed state-built free bridges. Most of the lawsuits were peacefully resolved,

15 “Extract from Minutes of the State Highway Commission Meeting, April 13, 1926.” Project Number FAP-164, Federal-Aid Project Files, Oklahoma Division, Bureau of Public Roads, stored at Fort Worth Federal Records Center, Fort Worth, Texas, Transfer Number F406-89-0022 (hereafter cited Federal-Aid Project Files, OKDBPR). This collection provides insight into the difficulty of siting and building the bridge and the relationship between the state and federal highway agencies.
16 “Heavy State Expense and Longer Route to George Key’s Bridge” Reprinted in the Cushing Daily Citizen, March 13, 1928, 4.
17 Ibid.
18 The highway department paved only a smaller portion of the 1928-29 route with Portland cement concrete, consisting of a short section between the west limits of El Reno to a point 300’ east of the Fort Reno Military Reservation boundary.
except for a few toll bridges over the Red River, principally a pivotal crossing for U.S. Highway 75 between Durant, Oklahoma, and Dennison, Texas.

The fight against toll spans took on new vigor in 1931 following the election of Governor William H. Murray, a Democrat operator who would guide Oklahoma through much of the Great Depression. Similar to Huey Long in Louisiana, Governor Murray fought private toll operators, framing the issue as a populist one.

On July 24, 1931, Murray declared martial law at the site of the Durant-Dennison Bridge. The governor ordered the National Guard to protect the newly constructed Highway 75 bridge which had been closed by a federal court order. Another company of guards barricaded the adjacent private span operated by the Red River Bridge Company and two other toll bridges, while highway department crews began to dismantle their approaches.

The standoff, dubbed the “Toll Bridge War”, made the front page of newspapers across the county. But it was short-lived, and the Highway 75 span opened for traffic two days later. The problem continued to bubble through the summer, with the governor calling out the National Guard again to protect free highway bridges across the Red River three months later.

Far less controversial, the state highway commission began negotiations to purchase the Key Bridge in 1928. Its acquisition came with another bridge owned by Key over the South Canadian River between Seminole and Pontotoc counties. Discussions continued for several years, with the State of Oklahoma purchasing the Key Bridge in June 1930 for $65,000.

**Closing the Gap**

Beginning in the early 1930s, the Oklahoma State Highway Commission targeted the improvement of U.S. Highway 66 as its dominant goal. The paving of State Highway 3 in 1928-29 between El Reno and Geary created a significant problem for developing a straight-line route to the South Canadian River.

The highway commission initially selected the controversial alignment to Geary, when it applied for federal aid to build U.S. 66. But it did not satisfy federal-aid funding guidelines, which encouraged direct routes. Considering the almost-predestined route to the old Key Bridge, and the Bureau of Public Roads’ wishes, the state agency formulated four alternatives. Each took a different path west from El Reno to meet the South Canadian River (Figure 2). The contemplated alignments balanced the investment already put into improving the Geary road, with consideration for the most logical site to span the meandering river.

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20 “Governor Orders Troops Guard Bridge Approach” *Daily Oklahoman*, July 24, 1931, 1,
21 Corbett, “Oklahoma’s Highways,” 240
Alternate Route No. 3 envisioned a new road north of the existing highway to Geary, increasing its length by several miles. Yet, according to Oklahoma bridge engineers, it presented an ideal site for a new bridge — an uncharacteristically narrow passage of the river north of the old toll span. Quite different, Route No. 4 moved in a direct westward trajectory, to cross the river several miles downstream from the toll bridge over a wide floodplain. This alternative would connect with a federally approved project for Highway 66 on the river’s west side.

Engineers from the Oklahoma State Highway Department and the Bureau of Public Road’s Fort Worth office inspected the routes, making several field trips over the summer and fall of 1930.

Walter J. Arnold, an assistant engineer with the federal agency who had participated in the field visits, prepared a report evaluating the alternatives. Each was considered under several criteria, including cost, mileage, existing traffic patterns, served population, alignment with federal aid routes, and if read between the lines, potential political fallout. Arnold, representing the bureau, preferred the most direct path — Route No. 4 — which he calculated would reduce the road length between El Reno and the river.23

In a separate study, a bureau bridge engineer estimated spanning the river on alignment No. 4 would require a longer bridge with deeper pier foundations than the state’s preferred route. However, Arnold countered that selecting the bureau’s preferred course would offset the additional expense of $125,000 of a longer bridge. Using a calculation of traffic mileage projected over five years, he predicted No. 4 would save Oklahoma $250,937.24

Confident of this, Arnold removed the original route to the Key Bridge and two of the alternatives from consideration, asking the highway commission to develop surveys, plans, and estimates for only Numbers 3 and 4.

Satisfied with the Bureau of Public Road’s directive, the Oklahoma State Highway Commission packaged the El Reno Cutoff in its ambitious $5,400,000 road program for 1932.

The two Democratic commission members, led by chairman Sam Hawks, pushed for Route No. 4, the most direct path favored by the federal agency. But the single Republican member instead agitated for the older the route, going to Geary. As reported by a local newspaper, the stakes were high as the cutoff would “eliminate a long curve in the highway.”25

Hawks, for his part, keenly understood the importance of promoting the cutoff. The chairman later claimed that building it would “make No. 66 a paved highway from the northeast to the western side of the state.”26 In this view, the El Reno Cutoff, with its massive bridge over the

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23 Walter J. Arnold, “Report on Revised Inspection Route, Project 164, Route No. 4,” c.1930. FAP-164, Federal-Aid Project Files, OKDBPR.
24 Ibid.
26 “Paving on ‘66’ to be Rushed,” Daily Oklahoman, May 7, 1932, 3.
South Canadian River, emerged as the linchpin for finishing Highway 66 across Oklahoma, and a critical component of the national quest for making the highway the straightest, most direct route possible.

Outvoted, Alternative Route No. 4, was selected and went out for bid in February. A day before the bids were received, the Canadian County commissioners sued the highway commission. Filing a writ mandamus, the county’s attorney claimed the state was obliged to honor a 1927 bond issue that set aside $500,000 to route the highway northwest to Geary — the same bond issue that paved the highway to the Key Bridge.

Commissioner Hawks refused to heed the district court suit — and the old way of doing business under which counties called the shots. Prevailing, the El Reno Cutoff was constructed as 16 miles of superior concrete road, heading due west to an as-of-yet unbuilt bridge.

ENGINEERING SIGNIFICANCE

In planning the new bridge, the Oklahoma State Highway Commission, working with the Bureau of Public Roads, was challenged by the site they had selected. The commission knew that the South Canadian “presented the greatest difficulties in bridge construction of any river in Oklahoma.” The bridge had to be long enough to cross the unpredictable river’s wide floodplain, yet economical. Through often-tense negotiations, the state and federal agencies settled on a scheme of linked Camelback pony spans, representing a cost-effective yet sturdy spanning technology. But supporting the spans proved equally challenging, as the river’s bedrock lay up to 60’ below the streambed.

As acknowledged by the highway commission, the deep bedrock and quicksand environment made pier construction “very difficult.” In further negotiations, often getting stuck over cost, Oklahoma and the Bureau of Public Roads selected a pneumatic caisson construction method for difficult bedrock sites. When finished in 1933, the William H. Murray Bridge was the longest bridge in Oklahoma and represented the best example of Camelback pony truss construction in the United States.

An Indefinite Proposition

For several months, state and federal highway engineers analyzed the best site to place the new bridge, considering the unpredictable river's challenges and the charge to build a direct road using Route No. 4. With its deep and unknown foundation and a history of deteriorated banks, the river posed a considerable problem. As announced by the highway commission, the “magnitude of project warranted careful and exhaustive studies.”

28 Ibid.
29 Ibid.
The investigation involved multiple field trips to observe the river’s course and structure. One of the participants, Carl T. Nitteberg (a bureau bridge engineer from the Fort Worth office) aired concerns about No 4’s crossing. Nitteberg, a graduate of the University of South Dakota who would work for the Bureau of Public Roads for 42 years, had much experience overseeing bridge construction. His Fort Worth office managed the bureau’s District 6, taking in Oklahoma, Texas, Louisiana, and Arkansas — each possessing wide, complex rivers.

In a January 1932 report, Nitteberg observed wrote that the South Canadian River was a "meandering stream, the bed of which consists essentially of quicksand overlaying at various depths."\(^{30}\) Its width between banks was nearly a mile, and due to its wandering nature, it was difficult to "contain the stream to any one permanent location."

Researching public records, the engineers learned that the river’s banks had been severely compromised during major floods. A flood in 1914 had washed away over 3,600’ of the Rock Island Railroad’s track at the south side. The damage caused the railroad to secure the embankment with what Nitteberg considered “very expensive protection work” made of huge rock jetties.\(^{31}\)

Nitteberg saw Rock Island's experience as an object lesson for building a highway bridge over the river. Its zigzagging course, which could result in its main channel being located at "one point one year [to] make a radical change the next," posed an existential problem for bridge construction.\(^{32}\)

Equally challenging was the river's bedrock. In most instances, the bedrock, made of Permian red shale — locally called "red bed" —offered sufficient hardness at less than 30' below the streambed. Given the unknown structure of the bedrock, however, federal engineers worried how deep the pier footings would have to be sunk.

Nitteberg wrote that he found the course of the river “an indefinite proposition and as far as I can determine there is not a site available which would at all fit in the location of the proposed highway which will permit the construction of a satisfactory bridge for a small expenditure of money.”\(^{33}\)

In light of the decisions already made, the federal engineer concluded the site would have to do, emphasizing the designers should “recognize the eccentricities of this river, bearing in mind that it may eventually be necessary to lengthen the bridge,” if its banks were damaged by flooding.\(^{34}\)

\(^{30}\) C. T. Nitteberg, “Special Report on South Canadian River Bridge (Bridgeport),” c.1932. FAP-164, Federal-Aid Project Files, OKDBPR.

\(^{31}\) Ibid.

\(^{32}\) Ibid.

\(^{33}\) Ibid.

\(^{34}\) Ibid.
Given the river’s behavior, he advised not using heavy pedestal-type abutments at the approaches, but instead treated timber piling, with the rationale that if the embankment washed away the bridge could be quickly extended with new spans. He suggested its length to be 3,930’, sufficiently long to cover the rambling waterway. He additionally suggested using steel trusses but on the condition that the specific type would be determined on where piers could be secured.35

Two Designs Emerge

Following the bureau’s direction, engineers from the Oklahoma State Highway Department began developing bridge designs. Homer White, the department’s Bridge Engineer, headed the effort. Graduating with a B.S. in Civil Engineering from Iowa State College of Agriculture and Mechanics Arts in 1913, White first worked for the American Bridge Company, one of the largest bridge-builders in the country. He joined the Oklahoma State Highway Department in 1922, serving as its chief bridge engineer for 22 years. White ushered in a new era of modern bridge design.

The federal bridge engineer’s advice established the new bridge’s parameters, from its span type, down to how the pier footings would anchor into the shale. Working within this framework, White developed the most logical solution for the difficult crossing. Along with members of the Bridge Department, he produced two schemes to span the South Canadian River. One consisted of 40 Camelback pony trusses of 100’ resting on open concrete caissons; the other, 20 K-truss spans of 210’ supported by either pneumatic or open concrete caissons. In both instances, 36’ I-beam spans would serve as the approaches. The truss spans were based on standard designs that the highway department had recently released for use.

The Oklahoma State Highway Department first attempted to develop standard bridge plans in the late 1910s. They were responding to the Federal-Aid Road Act of 1916 which required states to establish standard construction procedures, including uniform designs for culverts and bridges. Before standard designs, Oklahoma had relied on plans and specifications drawn up by bridge companies. In many instances, these were lightweight structures that had no use in highway construction. Like many states, Oklahoma initially lacked sufficient testing and engineering capability to develop workable standards, relying on the Bureau of Public Roads for technical assistance.

The department experimented with different bridge types to identify suitable structures for specific span lengths and load weights. In theory, standard designs could be deployed at different crossings without the cost of designing each bridge anew. Once refined, the standard plans were mass-produced by bridge companies to meet the department’s specifications.36

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35 Ibid.
greatly expanded its range of standard plans in the early 1930s, designing heavier structures that could handle the weight of oil trucks.37 As designed, the William H. Murray Bridge could carry the weight of multiple 16 ½ ton trucks.

Under the direction of Homer White, a University of Oklahoma engineering school graduate named Marion W. Hefley designed a sturdy combination Camelback pony truss, which became a standard drawing in 1932. The department selected the design as one of its main span types for bridges on federal-aid projects. The hybrid truss had high tensile strength and was found by the highway commission to be “economical to fabricate, erect and maintain,” but at the same time offering a “very rigid and sturdy structure.”38

The other alternative, the K-truss (also a variation of the Parker truss), divided its vertical members into smaller, compact sections, several with “K” diagonals. The department introduced the standard riveted steel K-truss plan the same year, for spans up to 210’.

Challenges and Compromises

The preliminary plans for the Oklahoma bridge were transmitted to the Bureau of Public Roads for review on May 9, 1932. The federal road authority made several suggestions. As communicated by Charles Swain, head engineer of the Fort Worth office, the bureau found “many undesirable features about the open caisson design” proposed by the highway department.39

Representing a 19th-century technology, the design employed caissons — hollow, cylindrical shafts used to support piers — which were driven into bedrock and later filled with concrete. The process involved excavating rock inside the caisson either by hand, with picks and shovels, or by a mechanical drill or dredge. The procedure became challenging, especially when bedrock was deep.

Federal engineers calculated the caissons would have to be sunk much deeper than the state had anticipated. Swain warned that there would be “considerable difficulty controlling open caissons of these dimensions for the depth proposed” and recommend the pneumatic method instead.40

The pneumatic procedure, traditionally employed for building foundations in water-bearing bedrock, used a system of airlocks to create a secure working chamber, unaffected by water.

37 “New Type of Road to Be Built Here,” American Guardian, October 3, 1930, 1.
39 C. T. Swain, letter to C. L. Wilson, May 24, 1932. FAP-164-H, Federal-Aid Project Files, OKDBPR. These comments were based on a detailed review of the preliminary drawings performed by George S. Vincent, the bureau’s Fort Worth bridge engineer.
40 Ibid. The referenced bridge spanned the Red River on U.S. Highway 77, south of Marietta.
Aside from a 1930 bridge over the Red River, which required extraordinary deep pier footings, Oklahoma did not use the system, considering it “neither necessary or economical.”

Swain acknowledged the pneumatic procedure would be more expensive but reasoned the ability to control the caissons would compensate for the extra cost. He wrote that in using the preferred method, the department should consider longer spans, showing a preference for the K trusses. Revealing the bureau’s cooperative, yet authoritative, position in these matters, Swain closed the correspondence stating that the pneumatic caissons “will, no doubt, be carefully considered in the preparation of the [revised] P. S. & E.”

Completed in early July, the revised plans presented three variations of the bridge layout agreed upon by the state and federal agencies. The favored design consisted of K-truss spans sitting on concrete piers supported by pneumatic caissons. An alternate used the same type of trusses but had the less desirable open caissons. A bridge of Camel pony trusses, resting on either open or pneumatic caissons, made up the third alternative. The final drawings appeared to be a compromise between the Bureau of Public Roads’ strong recommendation and Oklahoma’s interest in saving money.

George S. Vincent, a bridge engineer at the bureau’s Fort Worth office, reviewed the revised drawings. Vincent, who would later become the Chief of Bridge Research for the bureau and an expert on suspension bridges, found the final designs satisfactory but aired several criticisms. These included raising the curb heights, but also more significant issues, such as thickening the connections of the Camelback pony trusses to make them stronger.

Determining that the project could move forward, Vincent recommended sending the plans to the bureau’s Washington, D.C. office — the last stop of the approval process. Finally, Swain communicated to Oklahoma highway officials on July 12 that he would approve $532,112 for the bridge project, toward which the federal government would contribute $280,394, representing 53% of the total cost.

A Test of Federalism

But the approval came with a caveat. Swain indicated the release of funds was conditioned on the Oklahoma State Highway Commission starting work on several stalled federal-aid projects, including one to close a gap on Highway 66 near Wellston, in Lincoln County. Swain made it

42 C. T. Swain, letter to C. L. Wilson, May 24, 1932. This is after the federal engineer had already instructed Oklahoma that “only the pneumatic type be submitted” pier should be used in the revised drawings.
44 C. E. Swain to Oklahoma Highway Commission, July 12, 1932, FAP-164-H, Federal-Aid Project Files, OKDBPR. This is related to the so-called Wellston Gap, another instance where the highway commission sided with county commissioners to maintain an illogical routing to benefit a town, in this instance, Wellston.
clear that he would withhold the letter authorizing funds unless these projects were activated. Stepping beyond its usual approach of cooperation, the bureau used its approval power to force the highway commission to complete projects that had stalled because of local political bickering.

The tactic was unprecedented. While the federal agency had in the past withheld funding for projects they found unsatisfactory, approval had never been used as a bludgeon.45

In their 1931-32 biennial report, the highway commission complained that its recent interactions with the federal authority “have served to emphasize its rigid, unrelenting and dictatorial attitude toward this State.”46 While not explicitly referencing the bridge being built across the South Canadian River, deep frustration with the federal agency was obvious: “Unless its will prevails, even to the minutest detail, it withholds the funds allotted to this State until such time it literally forces obedience to its dictates.”47

The construction of the William H. Murray Bridge represented one of the most significant trials to federalism (the balance of state and federal control) of the period, which would not be experienced again to this degree until the interstate period.48

**Building a Mammoth Crossing**

Forced to obey, the highway commission publicized a notice for construction bids a few days later, with the three designs detailed. It circulated a perspective drawing of the bridge, showing it traversing the river and disappearing over the horizon (Figure 3). Prepared by Helen Bracht, a highway department drafter, the drawing was unique in its own right. It portrayed the repeating low-slung Camelback pony truss alternative, likely signaling the preference of the highway commission. Printed in several newspapers, the illustration must have produced awe at the sight of the proposed bridge’s length. Running in the *Daily Oklahoman*, the drawing came with the headline: “State to Spend $400,000 on U.S. Highway 66 Bridge.” A separate caption predicted it would be the “largest intrastate structure of its kind.”49

Only two companies submitted bids. Keliher Construction of Dallas proposed to build the federally favored K-truss design for $364,286.50 The Kansas City Bridge Company submitted a tender for $379,175 for the alternate K-truss layout with open caissons and a separate bid for

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45 Earlier in 1932, the bureau, concerned with Oklahoma’s continuance to honor county bond-invested alignments, withheld all federal aid. Up until this time, only Arkansas had been met with similar tactics.
47 Ibid.
48 In the early 1960s, the Bureau of Public Roads, to curtail shoddy interstate construction, stopped federal-aid payments to Oklahoma, Massachusetts, and New Mexico, until they improved their inspection and material testing programs. Earl Swift, *The Big Roads: The Untold Story of the Engineers Visionaries, and Trailblazers Who Created the American Superhighways* (Boston: Houghton Mifflin Harcourt, 2011), 222.
$346,665 for the Camelback pony span scheme. At the lowest bid, the Camelback pony bridge proposal won.

Established in 1893, in Kansas City, Missouri, the Kansas City Bridge Company had been active in Oklahoma for nearly three decades, erecting dozens of truss spans for county road authorities across the state. The smaller components of the project were awarded to J. J. Harrison, of Norman, to construct 2.67 miles of road and drainage features, and Ryan-Richards, the company that paved Highway 66 through Caddo and Custer counties two years earlier, to pave the road.51

No sooner were the contracts awarded when the Green Construction Company, an Oklahoma City contractor firm, filed an injunction claiming the highway commission had inappropriately used federal money for the award without obtaining matching funds from the state legislature.

The state's attorney general quickly intervened and approved the bridge contract, ensuring it would start as planned. The operation began on October 7, preparing the site; by January 1933, 120 men were working on the project, in three eight-hour shifts.52

As predicted by federal engineers, constructing the pier foundations proved difficult. By mid-January, only 16 of the 39 piers had been erected. Each required driving caissons 30’ to 60’ below the streambed. The complicated process involved building each caisson on site. The hollow concrete caissons — measuring 15’ to 20’ in length — were then lowered into the water, as a hemispherical dredge bucket scooped out the quicksand. Once bedrock was hit, a second caisson lowered to attach to the first. Using the pneumatic method, water was expelled from the connected shafts, allowing workmen (dubbed “sandhogs”) to dig into the shale to create a foundation. Finally, the caissons were filled with concrete and a pier attached.

While the hard pier work proceeded, other crews assembled the trusses by field-riveting panels together. Using a 24-hour shift, the highway department made great strides on the bridge, and in February found they were ahead of schedule with one-third of the spans erected.53

The project concluded on August 25, more than two weeks ahead of schedule. The other components of the project, the approaches and drainage features, had been finished months earlier. All had been achieved without any significant changes or cost overruns, though difficulties encountered during pier construction resulted in extra costs for excavation and concrete.54

The William H. Murray Bridge formed a large part of the Oklahoma State Highway Commission’s 1931-32 biennial report. Taking up six pages, the commission deemed it the

51 J. J. Harrison, $24,896.60; Ryan-Richards, $48,347.39; “Contract for New Span on U.S. Road,” Daily Oklahoman, August 8, 1932, 18.
“most pretentious bridge engineering project ever undertaken by the Oklahoma Highway Commission.”

When finished, it would be the longest bridge in Oklahoma and likely the longest in the Southwest. Excluding the municipally-owned structure over the Mississippi River near St. Louis, the highway commission considered it the largest bridge on Highway 66. In fact, it was the largest free bridge on the route from Illinois to California. But a ceremony recognizing this achievement would have to wait nearly a year, as a remaining section of the El Reno Cutoff still needed to be constructed.

Final Hurtle

It is unclear why the short 2.7-mile section, connecting the south side of the bridge to a Highway 66 project completed in 1931, was delayed. It likely became a victim of the growing financial restrictions of the Great Depression. While federal aid continued at a regular pace during the first years of the downturn, the system began to change in 1933, with the election of Franklin Delano Roosevelt.

Financed with national recovery aid, the project paving was begun on September 19, 1933. It included two smaller bridges, the most challenging constructed over a deep gorge lined by a creek and the tracks of the Chicago, Rock Island, and Pacific Railroad. The project came to completion on July 14, 1934 and three days later, the $450,656 bridge was finally dedicated. The event, attended by several thousand people, signaled the fulfillment of the El Reno Cutoff and the straightening of Highway 66 across Oklahoma.

Making a brief appearance in the movie *The Grapes of Wrath* (1940), the bridge remained the longest structure in Oklahoma until 1948, with the construction of the Roosevelt Bridge at Lake Texhoma. It remained the third longest bridge in the state through the 1950s. In 1948, the William H. Murray Bridge took on new service, carrying U.S. Highway 281, a function that continues. The longest of the three-digit federal highways, U.S. 281, it is an important north-south route, servicing the country's central section, from the Canadian border to Mexico.

In the spring of 1957 severe flooding inundated Oklahoma and caused widespread destruction. Many rivers, including the South Canadian, experienced record-setting levels. Flood water moved down the river, scoured the banks, but did not tear away the bridge’s abutments as once predicted. A project fortified the river banks and erected pile diversions upstream, but the highway’s fate had already been cast. In an echo of the program in the early 1930s that aimed to straighten U.S. 66, the Oklahoma State Highway Commission set a new goal to build a four-lane interstate between El Reno and the Texas line.

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The 1930s structure, now designated the William H. Murray Bridge, would serve another year as the main crossing of the South Canadian River. It was sidestepped in 1959, with the completion of a $2 million twin-span bridge on Interstate 40. The William H. Murray Bridge continued to carry local traffic on U.S. 66 until its decertification in 1985.

COMPARABLE PROPERTIES

The national context for U.S. Highway 66 allows resources to be nominated at a national level of significance, providing that a comparison of similar resources is made and the elevated significance is justified.

The construction of the William H. Murray Bridge occurred within the context of a state and national effort to improve U.S. Highway 66. The goal was to remove the highway's inefficient sections by straightening and improving its overall alignment and efficiency. Much of the early routing of Highway 66 was inefficient, sewn together with pre-existing roads — many of which better served the local population than were useful for building a national highway.

Additionally, private and municipal toll bridges over major river crossings hampered efficient movement. Using its purse, the Bureau of Public Roads encouraged — sometimes with a strong arm — more useful alignments and eliminating toll bridges. This direction was worked out in a give and take exchange between the bureau and the highway commission over the routing and design of the William H. Murray Bridge.

U.S. Highway 66: Major River Crossings

Spanning nearly 2,500 miles and traversing four distinct bioregions, U.S. Highway 66 spans five significant rivers (Mississippi, Arkansas, Canadian, Rio Grande, and Colorado), each posing a challenge to engineers and the finances of highway departments. The Mississippi — the largest and most difficult of the rivers — is ribbed with bridges built by municipalities and private companies in the first decades of the 20th century. As a result, the majority of bridges over the Mississippi pre-date the 1926 designation of Highway 66. These bridges are significant for their technology, incorporating several types of truss configurations with impressive center spans.

Notable bridges that transported Highway 66 over the Mississippi include the Chain of Rocks Bridge (1929) near St. Louis. The National Register-listed structure was built by a private bridge corporation and remained a toll bridge after public acquisition. It no longer carries automobile traffic. The McKinley Bridge (1910) and the St. Louis Municipal Bridge (1917) additionally carried Highway 66 at some point, but each started as a toll bridge financed by a municipality or private corporation. Only the Veterans Bridge (1951), an impressive 4,010’ Warren through truss structure, was built during U.S. Highway’s period of significance. But it too was financed by a municipal authority to serve several highways, of which Interstates 55 and 64 were predominant.
Similarly, bridges spanning the other major rivers were built before Highway 66's designation, with most underwritten by city, county, or private funds. Tulsa, Oklahoma’s 11th Street Arkansas River Bridge (1917), a City Beautiful styled open-spandrel concrete bridge, was constructed by the county and carried Highway 66 through 1959. The bridge was widened in 1934 and ceased automobile use in the 1980s.

Originally erected by the City of Albuquerque, the Central Avenue Bridge (1930) conducted U.S. Highway 66 over the Rio Grande. The bridge was expanded through state-federal funding in the 1950s, with a parallel structure. Neither bridge remains.

Crossing of the Colorado River — the highway’s final major river passage — was accomplished with the Topock Bridge (1916), a graceful and technologically significant brace-ribbed through arch. The states of California and Arizona and the U.S. Bureau of Indian Affairs built it for a precursor of Highway 66. The National Register-listed bridge transported U.S. 66 until 1947; later, its deck was removed for a natural gas pipeline, a service it still provides.

Considering major river crossings, the William H. Murray Bridge is the only example of a bridge built specifically for U.S. Highway 66 that remains in use.

Other Notable U.S. Highway 66 Bridges

There are other bridges on Highway 66 listed on the National Register. Almost all of them pre-date the highway’s designation and were originally associated with local or state transportation programs. The most notable of these is the Colorado Street Bridge (1912), an open-spandrel concrete arch bridge soaring over an urban arroyo in Pasadena, California. Los Angeles County financed the bridge, which connected Los Angeles and Pasadena for the first time. Highway 66 used it until the 1940s. Recognized as a National Historic Engineering Landmark, it is more closely linked with local transportation history and its City Beautiful background.

Other National Register designated bridges on Highway 66 were mostly built before the highway opened. These smaller spans incorporate representative trussing technologies of the period. Of the notable no-truss structures, there is the Canyon Diablo Bridge (1915), in Houck, Arizona, an example of a Luten-type reinforced concrete arch, and the Brush Creek Bridge (1924), a James B. Marsh-inspired concrete arch near Baxter Springs, Kansas.

Comparable Camelback Pony Truss Bridges

Developed as a variation of the Parker truss, the Camelback configuration began to see use in the 1910s, initially for smaller, one-span structures. The bridge type was economically attractive, as it required less material, with most of its components fabricated in the shop, leading to quicker assembly on site. The Camelback configuration took on use for highway construction in the 1920s when it became combined with a pony arrangement of the deck. Highway engineers found that the truss allowed for greater standardization and ease of construction in the field, and that
they could push it to 100’ span length. The pony arrangement at the lower chord made it economical, with less steel required.

State and county road authorities commenced using the Camelback pony truss in the 1920s for long single or short multiple span bridges on heavily traveled roads.

The Oklahoma State Highway Department emerged as one of the foremost proponents of the new spanning technology. At first, like other states, Oklahoma initially employed the hybrid truss for one-span bridges or as approaches to trusses spanning large waterways. After a damaging season of flooding in 1931, the department turned to the Camelback pony truss to replace destroyed bridges. Instead of selecting a different type of truss for the center span, designers linked repeating Camelback pony trusses to build the bridge.

With a truss length that reached 100’, each link could theoretically act as the center span in a meandering river environment. This was first successfully demonstrated in Western Oklahoma with the North Fork of the Red Bridge (1932). Seven 100’ Camelback pony spans were strung together to cross the river’s shifting oxbow. The bridge type emerged as a flexible and economic spanning technology for Oklahoma. The most impressive and challenging use of the form came with the nominated bridge, and the Camelback pony truss form saw its last use in the late 1940s.

As a rare bridge type, there are only a few Camelback pony trusses listed on the National Register. These are typically early, one-span examples, such as the Prairie Dog Bridge (1913), an 80’ single-lane structure near Orleans, Nebraska. The best examples of the heavier, long-span examples are found primarily in Texas and Oklahoma. Of these, the National Register-listed State Highway 79 Bridge at the Red River connecting Texas to Oklahoma (1939), and the undesignated Jenks Bridge (1948) in Tulsa, are the closest comparison. Yet these bridges are much shorter, measuring 2,255’ and 1,941’ respectively. The bridge on State Highway 79, because of its rarity, is listed at the state level of significance (NRHP #96001518). Over 1,000’ longer, the William H. Murray Bridge is indisputably the longest, best serving example of this rare property type in the United States.

CONCLUSION

Given the above comparative analysis, the William H. Murray Bridge rises to a national level of significance as the most important major river crossing associated with U.S. Highway 66. It is also nationally significant as the best example of a long-span Camelback pony truss bridge, a short-lived hybrid truss form used predominantly in the 1930s to span principal waterways.
9. Major Bibliographical References

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Hydro Review (Hydro, Oklahoma), newspaper: 1925-1934.


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William H. Murray Bridge
Caddo, Oklahoma


Previous documentation on file (NPS):

_____ preliminary determination of individual listing (36 CFR 67) has been requested
_x_ previously listed in the National Register (NRIS#04000129)
_____ previously determined eligible by the National Register
_____ designated a National Historic Landmark
_____ recorded by Historic American Buildings Survey #___________
_____ recorded by Historic American Engineering Record #__________
_____ recorded by Historic American Landscape Survey #__________

Primary location of additional data:

_x_ State Historic Preservation Office
_____ Other State agency
_____ Federal agency
_____ Local government
_____ University
_____ Other
William H. Murray Bridge  
Caddo, Oklahoma  
Name of Property  
County and State  

Name of repository: _____________________________________  
Historic Resources Survey Number (if assigned): ____________  

10. Geographical Data  

Acreage of Property app. 9.055 acres  

Use either the UTM system or latitude/longitude coordinates  

Latitude/Longitude Coordinates  
Datum if other than WGS84: ____________  
(enter coordinates to 6 decimal places)  

1. Latitude: 35.547273  
   Longitude: -98.312799  
2. Latitude: 35.547068  
   Longitude: -98.312589  
3. Latitude: 35.540095  
   Longitude: -98.322744  
4. Latitude: 35.540302  
   Longitude: -98.322973  

Or  

UTM References  
Datum (indicated on USGS map):  

☐ NAD 1927  or  ☐ NAD 1983  

1. Zone:  
   Easting:  
   Northing:  
2. Zone:  
   Easting:  
   Northing:  
3. Zone:  
   Easting:  
   Northing:  
4. Zone:  
   Easting:  
   Northing:  

Sections 9-end page 32
Verbal Boundary Description (Describe the boundaries of the property.)

The nominated boundary for the William H. Murray Bridge is a rectangle encompassing the bridge. Its length includes the 38 truss and two approach spans, piers, and abutments, and terminates at the concrete end panels of the approach spans. The width represents 50’ from each side of the bridge’s roadway centerline.

Boundary Justification (Explain why the boundaries were selected.)

The boundary includes all the structural components historically associated with the William H. Murray Bridge.

11. Form Prepared By

name/title: John W. Murphey, Architectural Historian
organization: Architectural History Services
street & number: 440 Jackson Drive
city or town: Santa Rosa state: CA zip code: 95409
e-mail: John@archhistoryservices.com
telephone: 707-583-7819
date: September 8, 2020

Additional Documentation

Submit the following items with the completed form:

- **Maps:** A USGS map or equivalent (7.5 or 15 minute series) indicating the property's location.

- **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.

- **Additional items:** (Check with the SHPO, TPO, or FPO for any additional items.)
The photographer's name, photo date, etc. may be listed once on the photograph log and doesn’t need to be labeled on every photograph.

**Photo Log**

Name of Property: William H. Murray Bridge

City or Vicinity: Bridgeport Vicinity

County: Caddo    State: Oklahoma

Photographer: John W. Murphey/Lynda S. Ozan

Date Photographed: February 28, 2020/September 3, 2020

Description of Photograph(s) and number, include description of view indicating direction of camera:

<table>
<thead>
<tr>
<th>Photograph Number</th>
<th>Subject</th>
<th>Direction of Camera</th>
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<tbody>
<tr>
<td>00001</td>
<td>View of main channel spans</td>
<td>East</td>
</tr>
<tr>
<td>00002</td>
<td>View road approaching south end of bridge</td>
<td>Northeast</td>
</tr>
<tr>
<td>00003</td>
<td>View off bridge from roadway</td>
<td>South</td>
</tr>
<tr>
<td>00004</td>
<td>View of deck and upper chord of Camelback pony truss spans</td>
<td>Northeast</td>
</tr>
<tr>
<td>00005</td>
<td>View of upper chords</td>
<td>South</td>
</tr>
<tr>
<td>00006</td>
<td>View of deck and upper chord of Camelback pony truss spans from mid-bridge</td>
<td>Northeast</td>
</tr>
<tr>
<td>00007</td>
<td>View of underdeck and pier</td>
<td>Northeast</td>
</tr>
<tr>
<td>00008</td>
<td>View of underdeck and upper chord</td>
<td>North</td>
</tr>
<tr>
<td>00009</td>
<td>Abutment</td>
<td>North</td>
</tr>
<tr>
<td>00010</td>
<td>South approach</td>
<td>Northeast</td>
</tr>
<tr>
<td>00011</td>
<td>South interior elevation (spans 1-6 from south approach)</td>
<td>Northeast</td>
</tr>
<tr>
<td>00012</td>
<td>North interior elevation (spans 1-6 from south approach)</td>
<td>Northeast</td>
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</tbody>
</table>
William H. Murray Bridge  
Name of Property  Caddo, Oklahoma  
County and State

Paperwork Reduction Act Statement: This information is being collected for applications to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listings. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C. 460 et seq.).

Estimated Burden Statement: Public reporting burden for this form is estimated to average 100 hours per response including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Office of Planning and Performance Management, U.S. Dept. of the Interior, 1849 C. Street, NW, Washington, DC.
Figure 1: Sketch Map.
William H. Bridge Murray Bridge.
Vicinity of Bridgeport, Caddo County, Oklahoma.
Heavy black line indicates nominated boundary.
Figure 2: Map of alternative routes for the El Reno Cutoff, 1931. Yellow circle indicates approximate future location of the William H. Murray Bridge. Courtesy Federal Highway Administration.
Figure 3: Drawing of bridge prepared Helen Bracht, 1932. Courtesy Oklahoma Department of Transportation.
Figure 4: Detail of location map for bridge project, 1932. Courtesy Oklahoma Department of Transportation.
Figure 5: Portion of elevation sheet of elevation drawing for bridge project, 1932. Courtesy Oklahoma Department of Transportation.

Figure 6: Detail of standard plan 100’ Camelback pony truss used for project, 1932. Courtesy Oklahoma Department of Transportation.
Figure 7: Detail of standard plan pier design and caisson shaft used for project. Courtesy Oklahoma Department of Transportation.
William H. Murray Bridge
N. U.S. Highway 281 over the South Canadian River
Bridgeport Vicinity, Caddo County, Oklahoma
William H. Murray Bridge, N. U.S. Highway 281 over the South Canadian River, Bridgeport Vicinity, Caddo County, Oklahoma
William H. Murray Bridge
N. U.S. Highway 281 over the South Canadian River
Bridgeport Vicinity, Caddo County, Oklahoma
**William H. Murray Bridge**

Name of Property

Caddo County, Oklahoma

County and State

Route 66 and Associated Historic Resources in Oklahoma

Name of multiple listing (if applicable)

---

**OK_Caddo County_William H. Murray Bridge_0001**

(Route 66 and Associated Historic Resources in Oklahoma” Multiple Property Listing (1995); “Historic Properties Associated with U.S. Highway 66, from Chicago to Santa Monica, 1926 to 1985” Multiple Property Documentation Form (2011))
OK_Caddo County_William H. Murray Bridge_0002

(Route 66 and Associated Historic Resources in Oklahoma” Multiple Property Listing (1995); “Historic Properties Associated with U.S. Highway 66, from Chicago to Santa Monica, 1926 to 1985” Multiple Property Documentation Form (2011))
William H. Murray Bridge
Name of Property
Caddo County, Oklahoma
County and State
Route 66 and Associated Historic
Resources in Oklahoma
Name of multiple listing (if applicable)

OK_Caddo County_William H. Murray Bridge_0003

(Route 66 and Associated Historic Resources in Oklahoma” Multiple Property Listing (1995); “Historic Properties Associated with U.S. Highway 66, from Chicago to Santa Monica, 1926 to 1985” Multiple Property Documentation Form (2011))
William H. Murray Bridge
Name of Property
Caddo County, Oklahoma
County and State
Route 66 and Associated Historic
Resources in Oklahoma
Name of multiple listing (if applicable)

OK_Caddo County_William H. Murray Bridge_0004

(Route 66 and Associated Historic Resources in Oklahoma” Multiple Property Listing (1995); “Historic Properties Associated with U.S. Highway 66, from Chicago to Santa Monica, 1926 to 1985” Multiple Property Documentation Form (2011))
William H. Murray Bridge
Name of Property
Caddo County, Oklahoma
County and State
Route 66 and Associated Historic Resources in Oklahoma
Name of multiple listing (if applicable)

OK_Caddo County_William H. Murray Bridge_0005
(Route 66 and Associated Historic Resources in Oklahoma” Multiple Property Listing (1995); “Historic Properties Associated with U.S. Highway 66, from Chicago to Santa Monica, 1926 to 1985” Multiple Property Documentation Form (2011))
National Register of Historic Places 
Continuation Sheet

William H. Murray Bridge

Name of Property
Caddo County, Oklahoma

County and State
Route 66 and Associated Historic Resources in Oklahoma

Name of multiple listing (if applicable)
OK_Caddo County_William H. Murray Bridge_0006

(Route 66 and Associated Historic Resources in Oklahoma” Multiple Property Listing (1995); “Historic Properties Associated with U.S. Highway 66, from Chicago to Santa Monica, 1926 to 1985” Multiple Property Documentation Form (2011))
William H. Murray Bridge
Name of Property
Caddo County, Oklahoma
County and State
Route 66 and Associated Historic Resources in Oklahoma
Name of multiple listing (if applicable)

OK_Caddo County_William H. Murray Bridge_0007
(Route 66 and Associated Historic Resources in Oklahoma” Multiple Property Listing (1995); “Historic Properties Associated with U.S. Highway 66, from Chicago to Santa Monica, 1926 to 1985” Multiple Property Documentation Form (2011))
Name of Property: William H. Murray Bridge
County and State: Caddo County, Oklahoma
Name of multiple listing (if applicable): OK_Caddo County_William H. Murray Bridge_0008
(Route 66 and Associated Historic Resources in Oklahoma” Multiple Property Listing (1995); “Historic Properties Associated with U.S. Highway 66, from Chicago to Santa Monica, 1926 to 1985” Multiple Property Documentation Form (2011))
William H. Murray Bridge
Name of Property
Caddo County, Oklahoma
County and State
Route 66 and Associated Historic Resources in Oklahoma
Name of multiple listing (if applicable)

OK_Caddo County_William H. Murray Bridge_0009

(Route 66 and Associated Historic Resources in Oklahoma” Multiple Property Listing (1995); “Historic Properties Associated with U.S. Highway 66, from Chicago to Santa Monica, 1926 to 1985” Multiple Property Documentation Form (2011))
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<td>Oklahoma</td>
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(Route 66 and Associated Historic Resources in Oklahoma” Multiple Property Listing (1995); “Historic Properties Associated with U.S. Highway 66, from Chicago to Santa Monica, 1926 to 1985” Multiple Property Documentation Form (2011))
OK_Caddo County_William H. Murray Bridge_0011

(Route 66 and Associated Historic Resources in Oklahoma” Multiple Property Listing (1995); “Historic Properties Associated with U.S. Highway 66, from Chicago to Santa Monica, 1926 to 1985” Multiple Property Documentation Form (2011))
William H. Murray Bridge
Name of Property
Caddo County, Oklahoma
County and State
Route 66 and Associated Historic Resources in Oklahoma
Name of multiple listing (if applicable)

Section number 11  Page 13

OK_Caddo County_William H. Murray Bridge_0012
(Route 66 and Associated Historic Resources in Oklahoma” Multiple Property Listing (1995); “Historic Properties Associated with U.S. Highway 66, from Chicago to Santa Monica, 1926 to 1985” Multiple Property Documentation Form (2011))