



America's River Crossing on I-55 over the Mississippi River Bridge Replacement

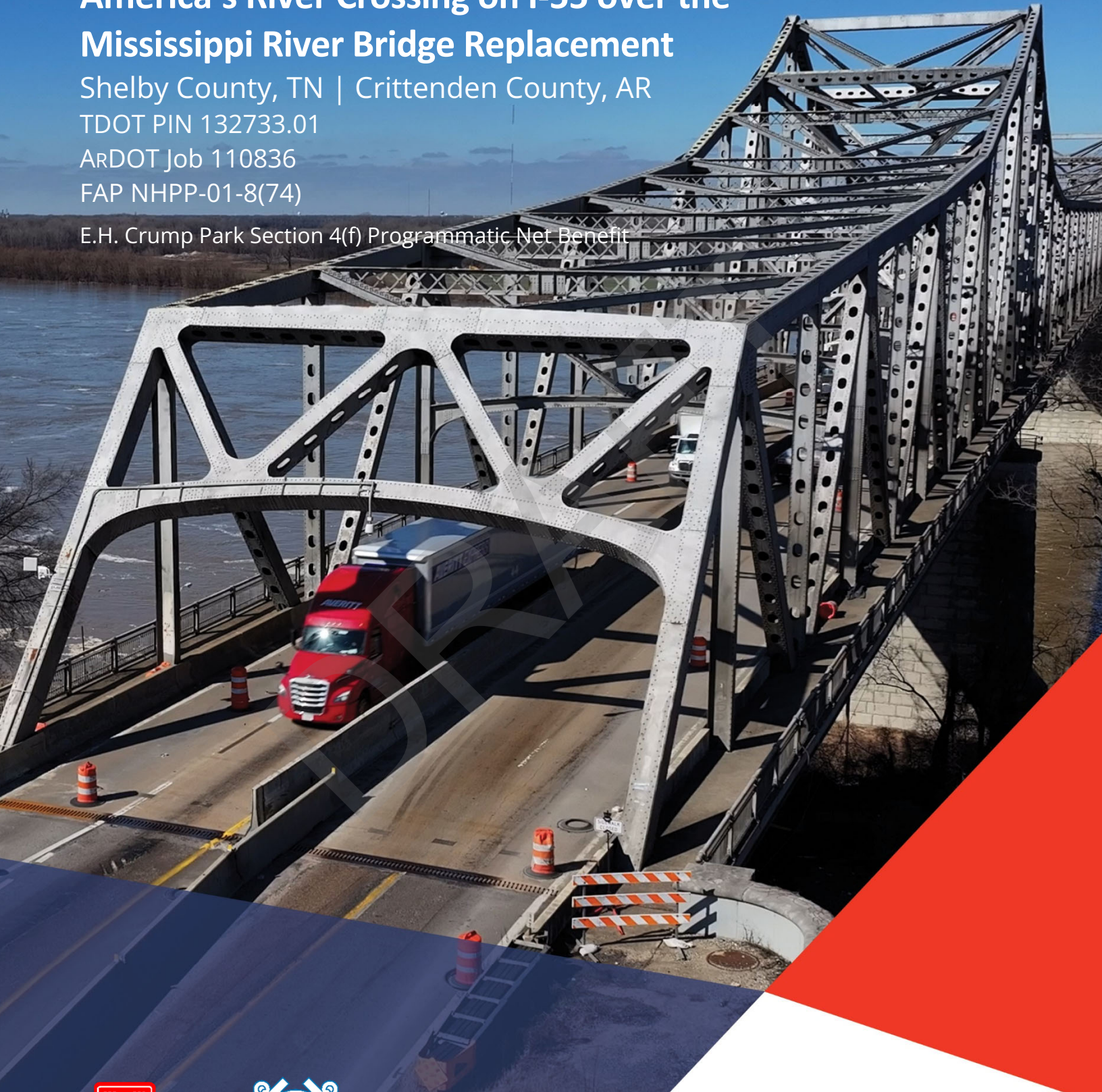
Shelby County, TN | Crittenden County, AR

TDOT PIN 132733.01

ARDOT Job 110836

FAP NHPP-01-8(74)

E.H. Crump Park Section 4(f) Programmatic Net Benefit



US Army Corps
of Engineers®



Last Updated: July 2024

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1. INTRODUCTION

The Tennessee Department of Transportation (TDOT) and the Arkansas Department of Transportation (ARDOT), in cooperation with the Federal Highway Administration (FHWA), proposes the replacement of the Memphis and Arkansas Bridge, which carries Interstate 55 (I-55), located in Shelby County, Tennessee, and Crittenden County, Arkansas. The proposed improvements are intended to reduce maintenance costs, improve mobility and connectivity, as well as strengthen local resiliency, and safeguard the route against severe seismic events.

The proposed roadway improvements extend from just west of I-55 Exit 12 in Tennessee to just east of I-55 Exit 1 (Bridgeport Road) in Arkansas. The proposed new bridge would be constructed offset to the west of the existing bridge. It is anticipated that the existing Memphis and Arkansas Bridge would be removed after project completion.

Because the proposed Project involves modifications to an interstate facility and would utilize federal funding, the proposed Project is subject to the requirements of the National Environmental Policy Act (NEPA). TDOT and FHWA are preparing an Environmental Assessment (EA) in accordance with NEPA to identify and evaluate the environmental effects of the proposed Project.

Section 4(f) of the Department of Transportation Act of 1966, now codified as [23 CFR 774](#), does not allow the FHWA to approve the Section 4(f) use of public parks, recreation areas, wildlife/waterfowl refuges, and historic sites unless there is no feasible and prudent alternative and that the proposed Project includes all possible planning to minimize harm to the Section 4(f) resource. Extensive planning has been conducted and appropriate measures have been followed to minimize harm and develop mitigation necessary to preserve and enhance the features and values of this property and surrounding parks within the Memphis River Parks. E.H. Crump Park is a resource that qualifies for protection under Section 4(f). In accordance with Section 4(f) regulations and policies, it has been determined that proposed Project would result in a net benefit¹ to E.H. Crump Park when compared to the future Do Nothing or avoidance alternatives and the present condition of the Section 4(f) property, considering the activities, features, and attributes that qualify the

¹ A "net benefit" is achieved when the transportation use, the measures to minimize harm and the mitigation incorporated into the project results in an overall enhancement of the Section 4(f) property.

property for Section 4(f) protection. This document presents a Section 4(f) Programmatic Net Benefit evaluation² for E.H. Crump Park.

1.1. Background

The existing I-55 bridge, which is also known as the Memphis and Arkansas Bridge, is nearly 75 years old and opened to traffic in December 1949. The I-55 bridge is one of only two Mississippi River crossings in the Memphis area, the other being the I-40 bridge, which opened to traffic in 1973 and is located approximately two miles north of the I-55 bridge. The next closest vehicular crossings of the Mississippi River are located approximately 71 miles north (I-155 bridge between Missouri and Dyer County, Tennessee) and approximately 54 miles south (U.S. Highway 49 (US 49) bridge between Helena, Arkansas, and Mississippi).

The I-55 bridge serves as a major freight corridor for the Mid-South (Memphis) Region³. In terms of total tonnage, truck freight represented 42 percent of the total tons in the Mid-South (Memphis) Region in 2019 and is forecasted to increase to 48 percent in 2050.⁴

1.2. Project Description

The proposed Project starts in Memphis, TN near the in-construction E.H. Crump interchange west bridge abutments and ends in Arkansas near the I-55/ Bridgeport Road interchange. The proposed Project is approximately 1.5 miles long and consists of on and off ramps to the E.H. Crump interchange, which would be modified to match the new bridge alignment. The proposed Project would include two, 12-foot wide through lanes in each direction, one, 12-foot wide auxiliary lane in each direction, and 10-foot inside and outside shoulders in each direction. The proposed bridge centerline is expected to be approximately 122 feet from the existing bridge centerline. This offset would allow the existing bridge to remain in service while the main span bridge over the river and the approach bridges are constructed. The goal would be to not divert traffic on the existing I-55 bridge to other routes during construction. Overnight single lane closures could be used to facilitate the transition from the existing to the proposed bridge.

² Section 4(f) Evaluation and Approval for Transportation Projects That Have a Net Benefit to a Section 4(f) Property

³ The Mid-South Region of the United States is usually thought to be anchored by the Memphis metropolitan area and includes portions of Tennessee, Mississippi, Arkansas, Missouri, and Kentucky.

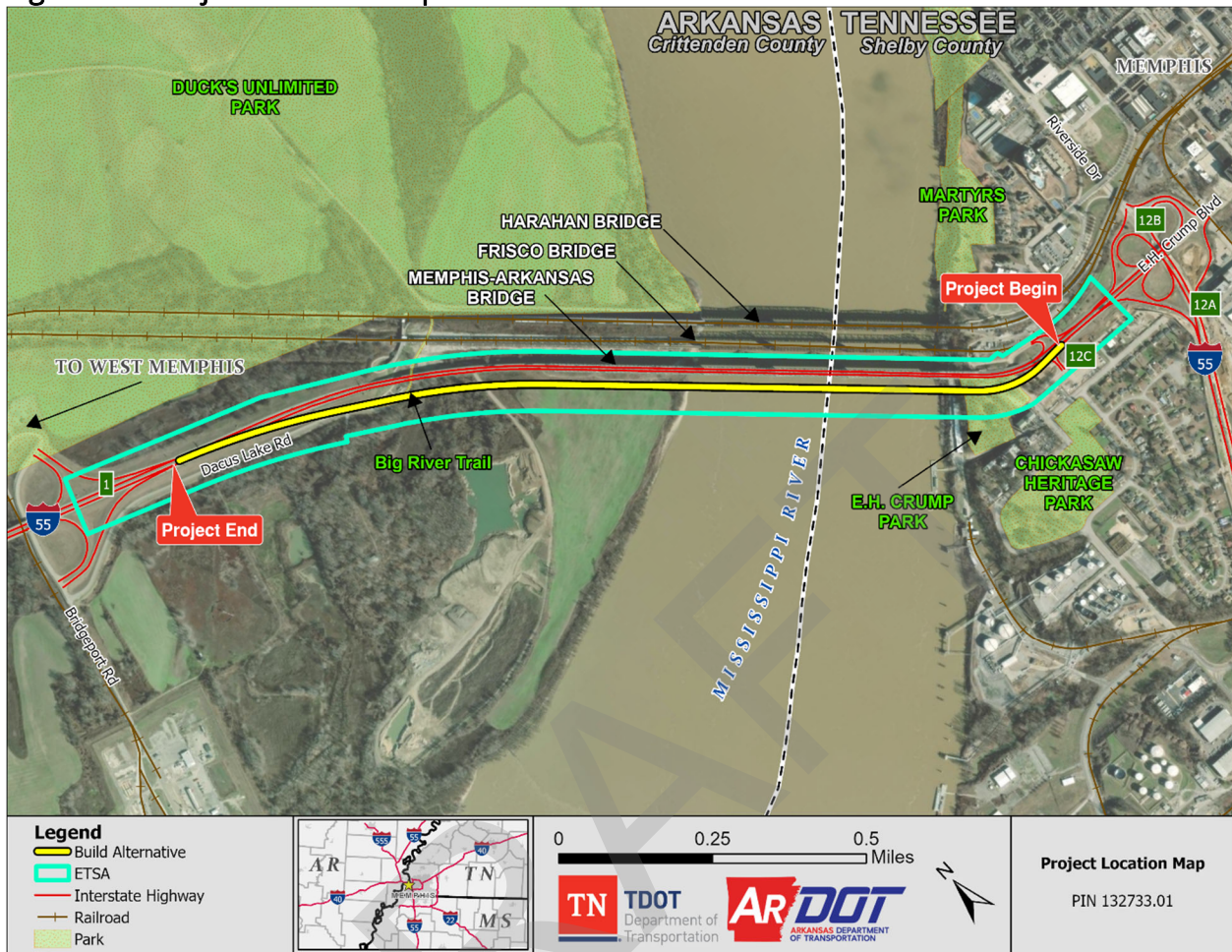
⁴ Mid-South Freight Flows and Industry Analysis, WSP, February 2023.

Starting from the Arkansas side, the proposed at grade roadway section connecting existing I-55 near the Bridgeport Road interchange would be nearly 1,400 feet in length, ending at the approach bridge abutment.⁵

The proposed approach bridge on the Arkansas side would be 3,000 feet in total length with piers at approximately every 160 feet, ending at the tie-down pier of the main span river crossing bridge. The proposed main span river crossing bridge itself would likely be a cable-stay system consisting of two or three pylons with piers aligned with the existing piers of the Frisco and Harahan Bridges to maintain the current navigation clearances. The proposed cable stay bridge length may vary between 2,400 feet to 2,800 feet in length depending on the final roadway configuration and coordination with the United States Coast Guard (USCG). Finally, the proposed roadway section on the Memphis side connecting to I-55 and the E.H. Crump interchange ramps would be approximately 950 feet in length. The proposed length of the modified southbound and northbound I-55 on/off-ramps connecting to the E.H. Crump interchange would be approximately 400 feet in length. In addition, approximately 1,200 feet of the Dacus Lake Road on the Arkansas approach would be realigned to maintain access to the Big-River Trail on the north side of the proposed roadway. See **Figure 1-1** below for the Project location and **Figure 1-2** for the typical section of the proposed improvements.

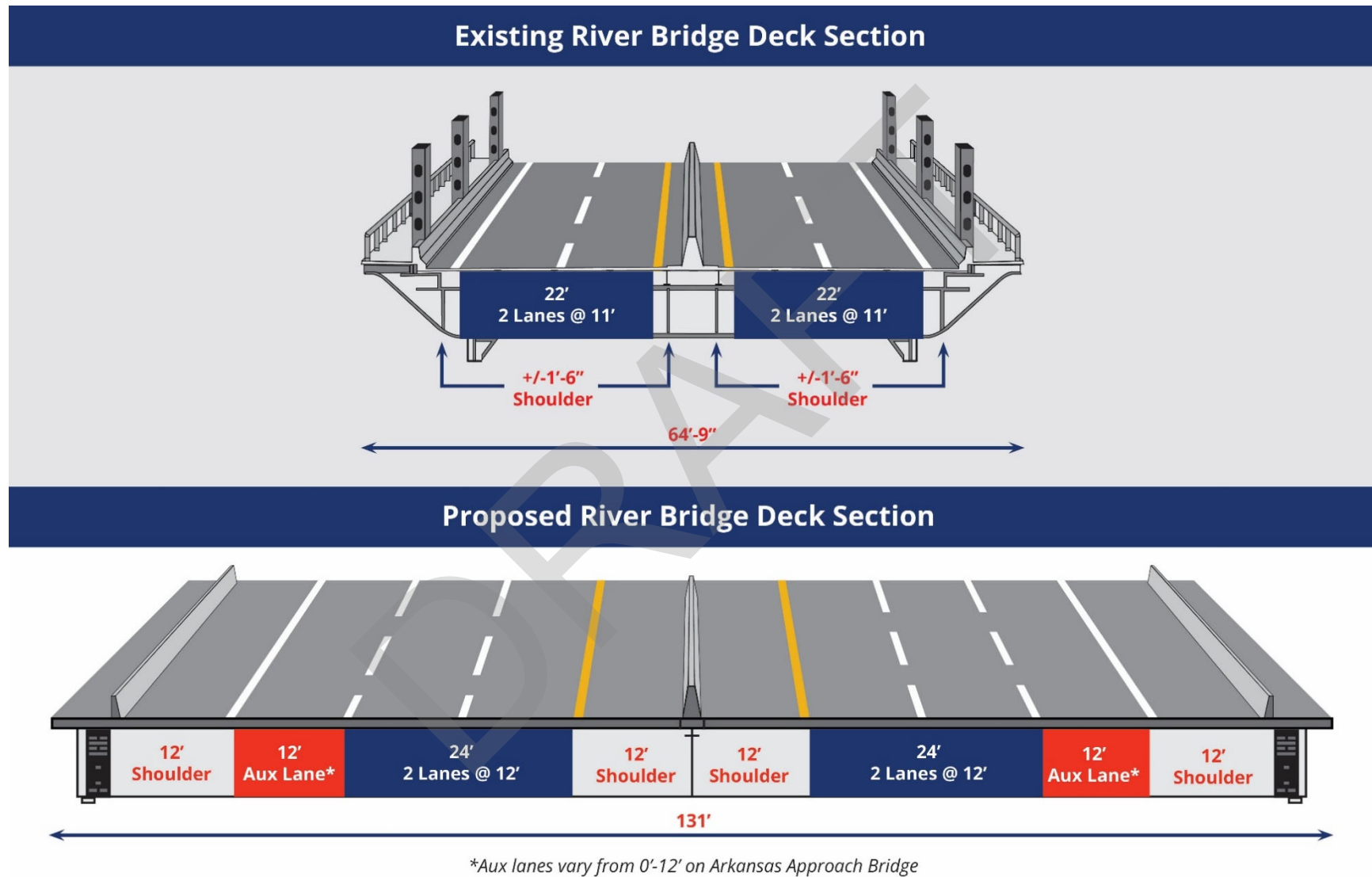
⁵ A bridge abutment is a retaining wall supporting the ends of a bridge, and, in general, retaining or supporting the approach embankment, <https://www.modot.org/common-bridge-terms>.

Figure 1-1. Project Location Map



Source: Project Team, 2024

Figure 1-2. Typical Sections



Note: Aux= Auxiliary; Source: Project Team, 2024

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1.3. Purpose and Need

The proposed Project's needs, purpose, and secondary goals are described below. Additional details on the purpose and need and secondary goals can be found in the *Environmental Assessment* and *Purpose and Need Memorandum*.

1.3.1. Needs

The proposed Project needs are as follows:

SAFETY



The Memphis and Arkansas Bridge was designed in 1944 and opened to traffic in 1949. As such, the facility has numerous well-documented geometric deficiencies which need to be updated in compliance with the [Manual for Assessing Safety Hardware \(MASH\)](#) guidelines.

National Bridge Inventory (NBI) Appraisal Ratings published in 2024 by ARDOT rate the existing bridge's deck geometry as "*Basically intolerable requiring high priority of replacement*". Additional NBI Bridge Condition Ratings show the existing bridge components to be at "*Fair*" or "*Satisfactory*" conditions.

MAINTAIN STATE OF GOOD REPAIR



The existing I-55 bridge does not meet current design standards, has had increased and ongoing maintenance costs, and hinders the resiliency of the regional tri-state network, all of which are needed to contribute to maintaining a state of good repair (SOGR). The existing I-55 bridge is not consistent with the objectives of both [TDOT](#) and [ARDOT's Transportation Asset Management Plans \(TAMPs\)](#) because it is a structurally deficient and poorly rated (NBI) bridge that cannot be maintained in a SOGR.

Regarding the high cost of maintaining the existing I-55 bridge, operating and maintenance (O&M) costs were assessed for the existing I-55 bridge as part of a March 2023 Benefit-Cost Analysis⁶. Maintenance of the existing I-55 bridge is shared by both TDOT and ARDOT. For bridge structures, O&M costs of \$50,000 per year (2023 dollars) is assumed for a proposed

⁶ *Targeted Approach for Crossing the Mississippi River Interstate 55 (US 64) (SR 61), Appendix F: Benefit-Cost Analysisist Technical Memorandum, March 2023*

new bridge. However, the O&M cost of maintaining the existing I-55 bridge structure would be approximately \$1M per year (2023 dollars). In addition, the current bridge coating was originally applied during the construction of the bridge in the late 1940s. Accordingly, bridge painting costs must account for the removal of lead-based paint, which requires a specialized containment system and regulated disposal. The repainting cost of the existing I-55 bridge structure per 30-years would be approximately \$50M (2023 dollars).

ABILITY TO WITHSTAND A STRONG EARTHQUAKE TO PROVIDE ROUTE RESILIENCY



The I-55 bridge is located within 100 miles of the New Madrid Seismic Zone (NMSZ). In December 1811, the area experienced the most powerful earthquake to hit the contiguous United States east of the Rocky Mountains in recorded history, estimated to be between magnitude 7 and 8 on the [Richter Scale](#)⁷, which is a quantitative measure of an earthquake's magnitude. At least three

large aftershocks with magnitudes that were estimated in range from 6.0 to 7.0 occurred in early 1812. In addition, hundreds of small seismic events still occur annually in the NMSZ. The existing I-55 bridge was not constructed to withstand a strong earthquake, which is defined by The U.S. Geological Survey as a magnitude of 6.3 or higher on the Richter Scale. An earthquake could not only damage the existing bridge, but could also lead to a disruption of normal traffic operations and use of I-55 as an emergency evacuation route.

1.3.2. Secondary Goals

The secondary goals for the proposed Project are summarized below, with additional details included in the *Purpose and Need Memorandum*.



ENHANCE MULTIMODAL CONNECTIVITY, INCLUDING NON-MOTORIZED ACCESS

Multimodal connectivity is lacking in the vicinity of the existing I-55 bridge. The proposed Project would explore the feasibility of expanding the existing shared use path, connecting non-motorized travelers in the project area to jobs, parks, and recreation and improving connections to the Big River Crossing. Additionally, the proposed Project would address better connectivity at existing trailheads along the Big River Crossing.

⁷ The magnitude of the December 1811 earthquake and subsequent aftershocks were estimated because the Richter Scale was not devised until 1935.



IMPROVE FREIGHT MOVEMENT - In terms of total tonnage, truck freight represented 42 percent of the total tons in the Mid-South (Memphis) Region in 2019 and is forecasted to increase to 48 percent in 2050. I-55 serves as a major freight corridor for the Mid-South region. Existing traffic on the I-55 bridge was approximately 30 percent trucks.



PROMOTE INNOVATIVE AND TIMELY DELIVERY - The proposed Project would be delivered via an alternative delivery method to expedite the project and begin construction in 2026. Alternative delivery encourages contractors to streamline their work to finish projects early while also encouraging the identification and incorporation of innovative solutions to address issues such as travel delays and access to businesses. The proposed Project is planning to consider several innovative technologies during the design and construction phases. These innovative technologies include, but are not limited to seismic innovations, wind performance, material innovations, security innovations, safety innovations, and energy saving enhancements.



IMPROVE THE ECONOMIC VITALITY OF THE REGION - By reducing congestion and improving travel times, the proposed Project would potentially expand businesses' access to customers, suppliers, and workers, thereby increasing their productivity, sales, and ability to create new jobs. The proposed Project would also eliminate logistics costs valued at \$174,413 per day resulting from lost trips due to a bridge closure. This avoided cost will unlock additional revenue and job creation among regional shippers and carriers. The proposed Project would enhance mobility to meet the current and future demands of growth and employment, ultimately contributing to the economic prosperity of Memphis, West Memphis, and the broader tri-state area.

1.3.3. Purpose

The purpose of the proposed Project is to improve geometric and structural deficiencies of the existing bridge, reduce ongoing maintenance costs and return the I-55 bridge to a state of good repair, and provide an earthquake resilient route that also has operational continuity for freight and passenger vehicles.

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2. APPLICABILITY AND SECTION 4(F) USE

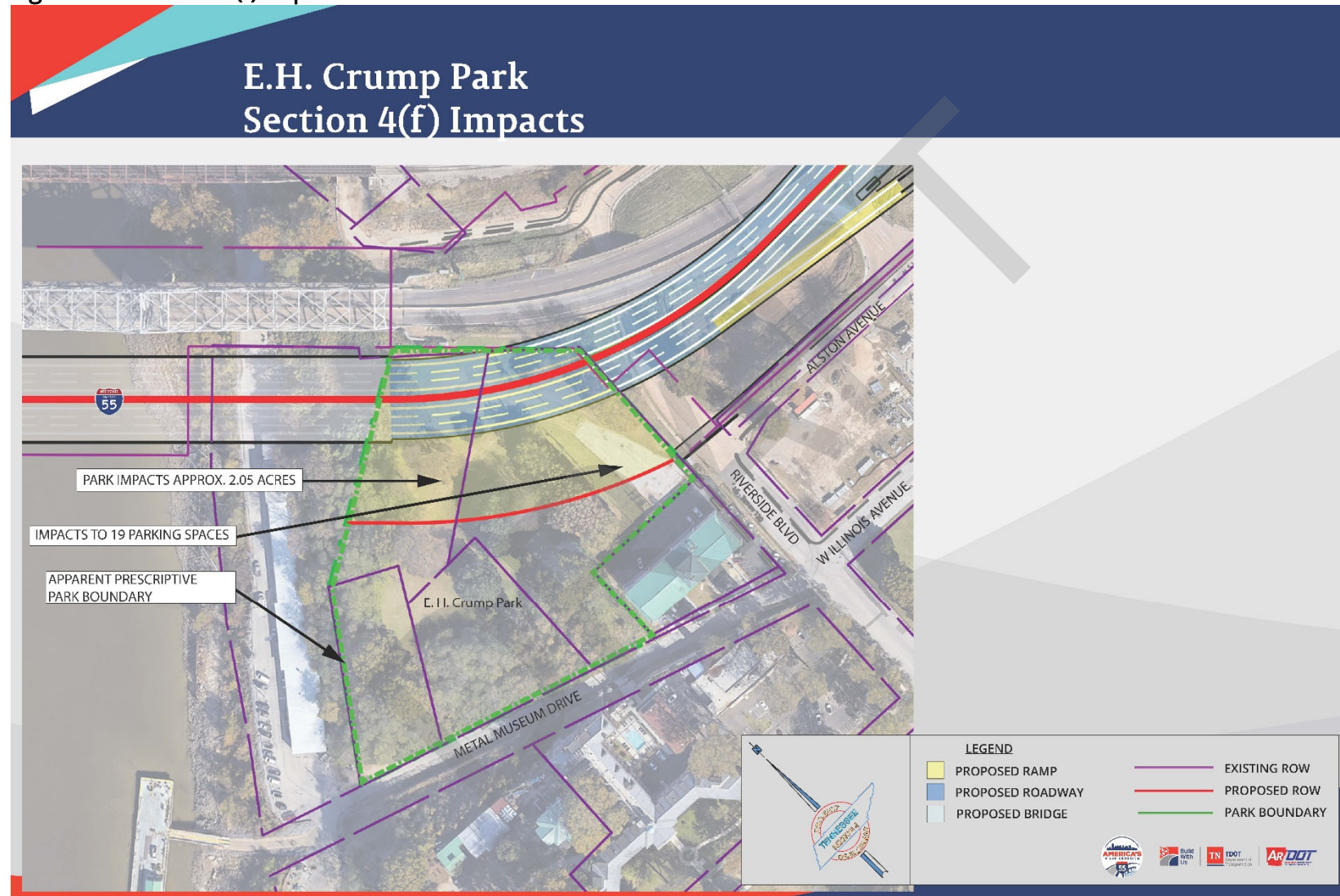
E.H. Crump Park is a publicly owned park that is open to the public. It is a 4.3 acre open-field and picnic area with scenic river views. E.H. Crump Park is owned by the City of Memphis and is the Official with Jurisdiction (OWJ)⁸ for this resource. E.H. Crump Park is considered significant as it plays an important role in providing passive recreation as well as contributing to the larger park network in Memphis along the Mississippi River.

The proposed Project would impact E.H. Crump Park. As shown in **Figure 3-1**, approximately 2.05 acres of the 4.3-acre park would be converted to transportation use. In addition, the proposed Project would impact 19 existing parking spaces.

⁸ The legal representative of the agency owning or administering the resource, unless the agency has delegated or relinquished this authority via formal agreement. Some Section 4(f) properties may have multiple Officials with Jurisdiction. Adapted from [Section 4\(f\) Tutorial | Key Terms](#).

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Figure 2-1. Section 4(f) Impacts



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3. IDENTIFY ADDITIONAL SECTION 4(f) PROPERTIES IN THE PROJECT AREA

Additional Section 4(f) properties in the proposed Project area include the following, which are shown in **Figure 1-1**:

- **Big River Trail.** The Big River Trail starts at the Big River Crossing and comprises more than 110 miles of riverside trails atop the Mississippi levee system. Big River Crossing serves as the connection point of Main Street in Memphis, Tennessee to Main Street in West Memphis, Arkansas, a 10-mile modal corridor. The proposed Project would impact the existing trailhead of the Big River Trail in West Memphis, Arkansas. To mitigate the proposed action, TDOT would fund a new trailhead located on the footprint of the existing bridge/roadway.
- **Ducks Unlimited Park.** Ducks Unlimited Park is a 1,500-acre public park and conservation site located by the Mississippi River in West Memphis, Arkansas. Ducks Unlimited Park currently features a paved 7-mile loop trail (Big River Trail), a paved 0.5 mile out and back trail, a seasonal sunflower field, and lookouts with views of the Mississippi River and Memphis skyline. Ducks Unlimited Park would not be impacted by the proposed Project.
- **Martyrs Park.** Martyrs Park is located along the banks of the Mississippi River in Memphis, immediately to the north of I-55. Benches line a paved multi-use trail and off-street parking is available. Martyrs Park would not be impacted by the proposed Project.
- **Chickasaw Heritage Park.** Chickasaw Heritage Park is a 17-acre park located southeast of E.H. Crump Park. It includes historic markers and statues, Native American earth mounds, an outdoor basketball court, a playground, a ball field, and a pavilion. Chickasaw Heritage Park would not be impacted by the proposed Project.

Note: Historic Section 4(f) properties are evaluated in a separate document

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4. ALTERNATIVES CONSIDERED/FINDINGS

4.1. Do Nothing

The Do Nothing Alternative would retain the existing Memphis and Arkansas Bridge as the I-55 bridge across the Mississippi River, thereby not impacting the existing trailhead at E.H. Crump Park. Under this alternative, the existing bridge would receive normal maintenance, but other work would be avoided.

Under this proposal, the structure would continue to deteriorate and become increasingly hazardous to users of I-55. For the following reasons, this alternative is not feasible and prudent.

- a. Maintenance – Normal maintenance is not adequate to cope with the situation because geometric deficiencies and deterioration would not be corrected under the Do Nothing Alternative.
- b. Safety – The Do Nothing Alternative does not address the problems that cause the bridge to be considered to be deficient. The bridge does not meet the current design level for interstate bridges and is functionally obsolete. The Do Nothing Alternative would not address safety concerns, including seismic vulnerabilities, the high number of crashes, the narrow lane width, lack of shoulders, and the hazardous narrowing of the bridge roadway from the approach roadway on both sides. Furthermore, if the bridge remained in place, its piers would pose a navigational challenge and safety risk to river navigation due to potential allusions.

Failure to replace or rehabilitate this bridge would leave an insufficient structure carrying I-55 across the Mississippi River. Because of these deficiencies, the bridge poses unacceptable safety hazards to the traveling public on I-55.

The Do Nothing Alternative is not feasible and prudent because it neither addresses nor corrects the transportation need cited in the purpose and need.

4.2. Improvement without Using Adjacent Section 4(f) Lands

Two types of alternatives were evaluated for improvement without using the adjacent Section 4(f) lands: rehabilitation and replacement of the existing bridge on the existing alignment.

Rehabilitation: Under this alternative, TDOT and ARDOT would substantially rehabilitate the existing bridge to current standards. For the following reasons, this alternative is not feasible and prudent.

- a. Structural deficiencies – It is not feasible to rehabilitate the existing bridge for continued automobile use due to its design. Because the existing bridge is a through truss, it cannot be widened to improve deck geometry and meet current design criteria for interstate bridges. The bridge cannot be rehabilitated for vehicular use without affecting the bridge’s historic integrity. These spatial constraints also make rehabilitation for pedestrian and bicycle use infeasible due to the high loading demands required by current design criteria.
- b. Safety – The bridge would require lead paint removal and seismic retrofitting to current standards; this work is not feasible due to substantial and prohibitive ongoing maintenance costs. Furthermore, keeping the bridge in place poses a navigational challenge and safety risk to river navigation due to potential allusions.

The bridge is structurally obsolete and cannot be rehabilitated. The costs of mandatory and immediate rehabilitation of the historic bridge, along with additional costs for ongoing repairs, would be financially infeasible compared to the cost of constructing a new bridge.

Replacement of existing bridge on existing alignment: This alternative would include removal of the existing bridge and construction of the proposed bridge on the existing alignment. This alternative is not prudent because it does not facilitate maintenance of I-55 traffic through construction. Because the existing structure is a steel thru-truss, it cannot be partially removed to allow traffic to be maintained on the remaining portion while half the width of the proposed structure is constructed. With an estimated construction duration of four years, detouring I-55 traffic to I-40, the only other vehicle crossing of the Mississippi River in Memphis, would result in unique and unacceptable traffic operation and economic impacts.

These alternatives have been determined to fail the Section 4(f) prudent and feasible standard and are not recommended.

4.3. Avoidance Alternative on New Alignment

This alternative would involve either realigning I-55 to the north or further south of the existing bridge. Shifting I-55 north of the existing bridge location is not feasible because of the immediately adjacent Harahan and Frisco railroad bridges crossing the Mississippi River. Realignment further south is not prudent because of the close proximity of the adjacent E.H. Crump interchange currently under construction, which would require major modifications to the E.H. Crump interchange. The proposed I-55 alignment minimizes encroachment on E.H. Crump Park. Any realignment further south would only increase the amount of encroachment on E.H. Crump Park. A new alignment would create impacts, costs and difficulties of extraordinary magnitude when compared to the proposed use of E.H. Crump Park.

This alternative is determined to fail the Section 4(f) prudent and feasible standard and is not recommended.

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5. MEASURES TO MINIMIZE HARM

To reduce impacts to E.H. Crump Park, all appropriate measures to minimize harm have been included. The proposed bridge alignment has been placed as close to the existing alignment as feasible, thereby minimizing the amount of right-of-way needed. In addition, the use of retaining walls on the bridge approach roadway would be considered during final design to further minimize encroachment on E.H. Crump Park.

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6. MITIGATION COMMITMENT

To mitigate the proposed action, TDOT would fund a new park trailhead to the east of the existing parking spaces that would be removed by the proposed bridge alignment. Shown in **Figure 3-2**, the proposed trailhead would include 22 parking spaces, parking lot lighting, restroom facilities, and the potential for park benches and a bicycle repair equipment station.

Mitigation would also include the construction of a shared use path (SUP) connecting through E.H. Crump Park, traversing under the proposed I-55 bridge, under the existing railroad bridges (Harahan and Frisco), and connecting north to Martyrs Park and east to the Big River Crossing trailhead. Covered SUP canopy protection would be provided under the railroad bridge crossings. The existing “Memphis & Arkansas Bridge Poem Marker” would be relocated along the SUP between I-55 and the railroad bridges. In addition, the existing sidewalk connecting Channel 3 Drive through the E.H. Crump interchange roundabout to Alston Drive, which is currently under construction, would be enhanced to meet current design standards of 10-foot minimum width.

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Figure 6-1. Conceptual Mitigation

E.H. Crump Park Conceptual Mitigation



The Tennessee trailhead will include:

- 22 New trailhead parking spaces (to replace approx. 20 existing parking spaces at E.H. Crump Park)
- New parking lot lighting
- New restroom facilities at trailhead
- Potential for new benches and bicycle repair equipment

The proposed shared use path (SUP) would connect through E.H. Crump Park, under the proposed I-55 bridge, under the existing rail road bridges, ultimately connecting to Martyrs Park and east to the Big River Crossing trailhead. Covered SUP canopy protection will be provided under the railroad bridge crossings.

The existing "Memphis & Arkansas Bridge Poem Marker" will be relocated along the SUP between I-55 and railroad bridges.

The existing sidewalk connecting Channel 3 Drive through the E.H. Crump Interchange roundabout to Alston Drive, which is currently under construction, would be enhanced to meet current standards of 10'-foot minimum width.

LEGEND

- | | |
|--|--|
| ■ PROPOSED RESTROOM FACILITY | ■ PROPOSED BRIDGE |
| ■ PROPOSED SHARED USE PATH | ■ PROPOSED INTERSTATE/INTERCHANGE ROADWAY |
| ■ ENHANCED SHARED USE PATH | |
| ■ PROPOSED REDEVELOPED OPENSOURCE | |



Source: Project Team, 2024

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7. PUBLIC INVOLVEMENT AND OWJ COORDINATION

A notice of Section 4(f) Net Benefit Determination public notice was published by TDOT on [enter date] online and in the following publications: [enter publications].

This notice is in accordance with 23 CFR 774.5(a), which requires public notice and concurrence in writing from the OWJ over the Section 4(f) resource that the proposed Project would have a net benefit to the activities, features, or attributes that make the property eligible for Section 4(f) protection. In the case of this project, the City of Memphis has been identified as the OWJ over E.H. Crump Park.

The OWJ must agree in writing with the assessment of impacts, the proposed measures to minimize harm, and the mitigation and agree that the measures will result in a net benefit to the Section 4(f) property.

The correspondence is included in **Appendix B**.

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8. SUMMARY

The proposed Project meets all the applicability criteria set forth by FHWA's guidance for Programmatic Evaluation for Transportation Projects that have a Net Benefit to a Section 4(f) Property. All alternatives set forth in the subject programmatic were fully evaluated and the findings made are clearly applicable to this proposed Project. There are **no feasible and prudent alternatives** to the use or take from the E.H. Crump Park.

The proposed Project includes all possible planning to minimize harm. TDOT will include the measures to minimize harm as environmental commitments in the applicable NEPA document for the proposed Project.

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APPENDIX A. PHOTOS OF SECTION 4(F) RESOURCES



Photograph taken from existing parking lot looking northwest at the existing Memphis and Arkansas Bridge.



Photograph taken from existing parking lot looking east towards Metal Museum Drive.



Photograph taken from north of the existing parking lot looking northwest at the existing Memphis and Arkansas Bridge.



Photograph taken from north of the existing parking lot looking south towards the Super 8 Wyndham Hotel.

**APPENDIX B. CONCURRENCE LETTER FROM
OFFICIALS WITH JURISDICTION**