

# Interstate 49 Alternative Delivery Study

## Executive Summary

Highway 22 to Interstate 40

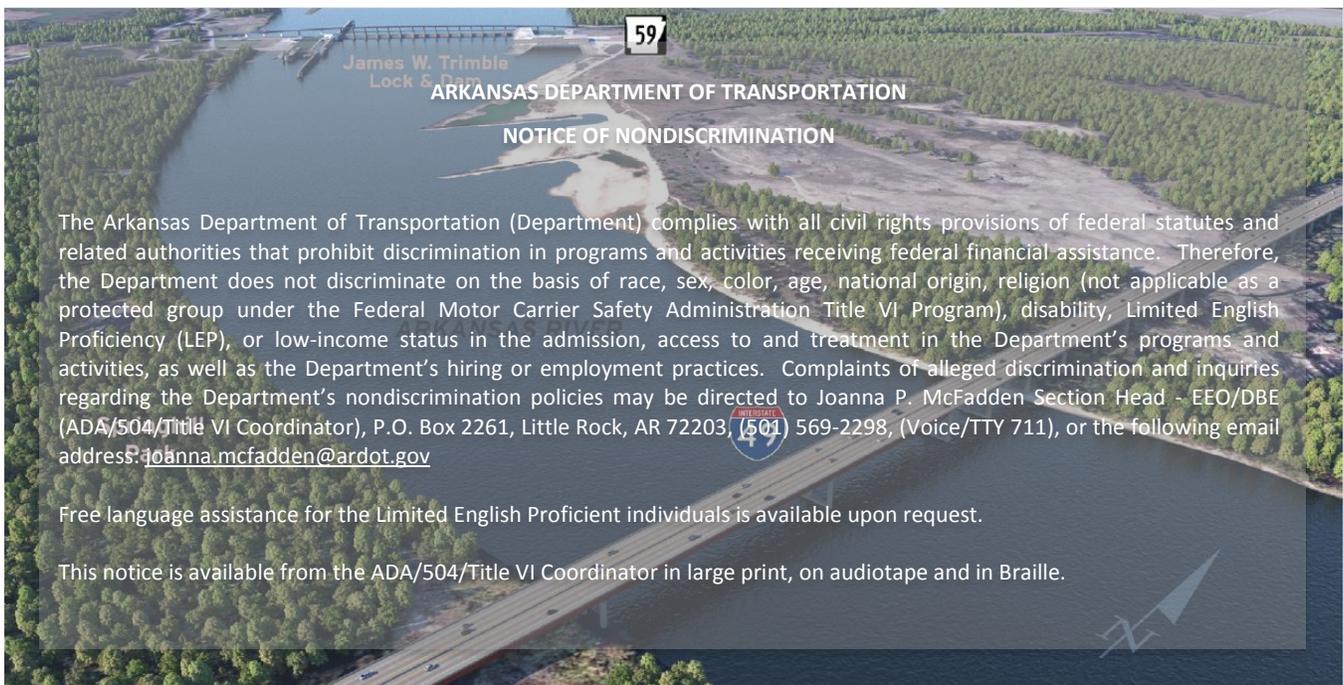
Crawford and Sebastian Counties  
Job No. 040748



Submitted by: **HNTB**

Prepared for Transportation Planning and Policy Division  
Arkansas Department of Transportation  
In cooperation with the Federal Highway Administration

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# INTRODUCTION

The Arkansas Department of Transportation (ARDOT), in cooperation with the Federal Highway Administration, is preparing a re-evaluation of the Final Environmental Impact Statement for a new section of Interstate 49 (I-49). The new segment (**Figure 1**) would connect Interstate 40 (I-40) in Crawford County with Highway 22 (Hwy. 22) in Sebastian County, a length of approximately 13.7 miles.

ARDOT, like other state departments of transportation, is facing challenges in providing needed transportation improvements with limited local, state, and federal funds. As directed by Arkansas State Highway Commission (AHC) Minute Order 2016-092 (**Appendix A**), tolling was evaluated as a potential funding option for this project. This feasibility analysis includes an assessment of project costs, toll revenues, and project financing strategies.

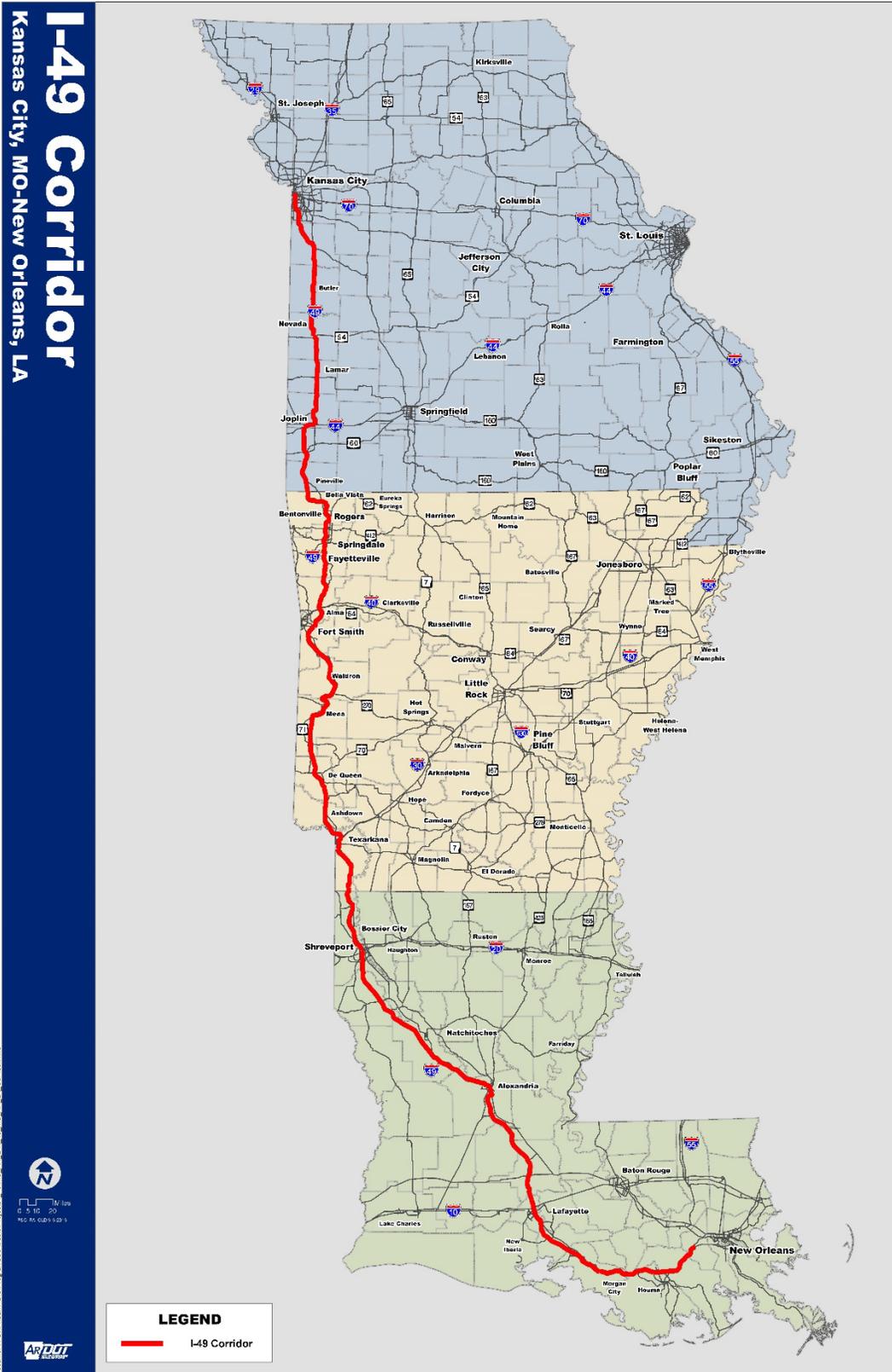
# BACKGROUND

Interstate 49 is Congressionally-designated as High Priority Corridor No. 1. When completed, I-49 will connect Kansas City, Missouri, to southern Louisiana, passing through the Fayetteville-Springdale-Rogers metropolitan area, Fort Smith, and Texarkana (**Figure 2**). In Arkansas, I-49 has been completed between the Fayetteville-Springdale-Rogers metropolitan area and Fort Smith, and between Texarkana and the Louisiana state line. ARDOT is actively improving I-49 in northwest Arkansas, including widening of existing sections and construction of the I-49 Missouri-Arkansas Connector. In Missouri, I-49 is complete except for a connection between Pineville and the Arkansas state line. In Louisiana, I-49 is complete to Lafayette except for a connection through Shreveport.

Figure 1 – Project Location Map



Figure 2 – I-49 Corridor Map



When completed, I-49 will connect western Arkansas to the larger Interstate Highway System, including: Interstate 30 in Arkansas, Interstate 10 and Interstate 20 in Louisiana, and Interstate 29 and Interstate 70 in Missouri. This project would provide a vital connection between I-40 and the already completed Highway 549, serving the Fort Chaffee area and facilitating efficient north-south passenger and freight movements.

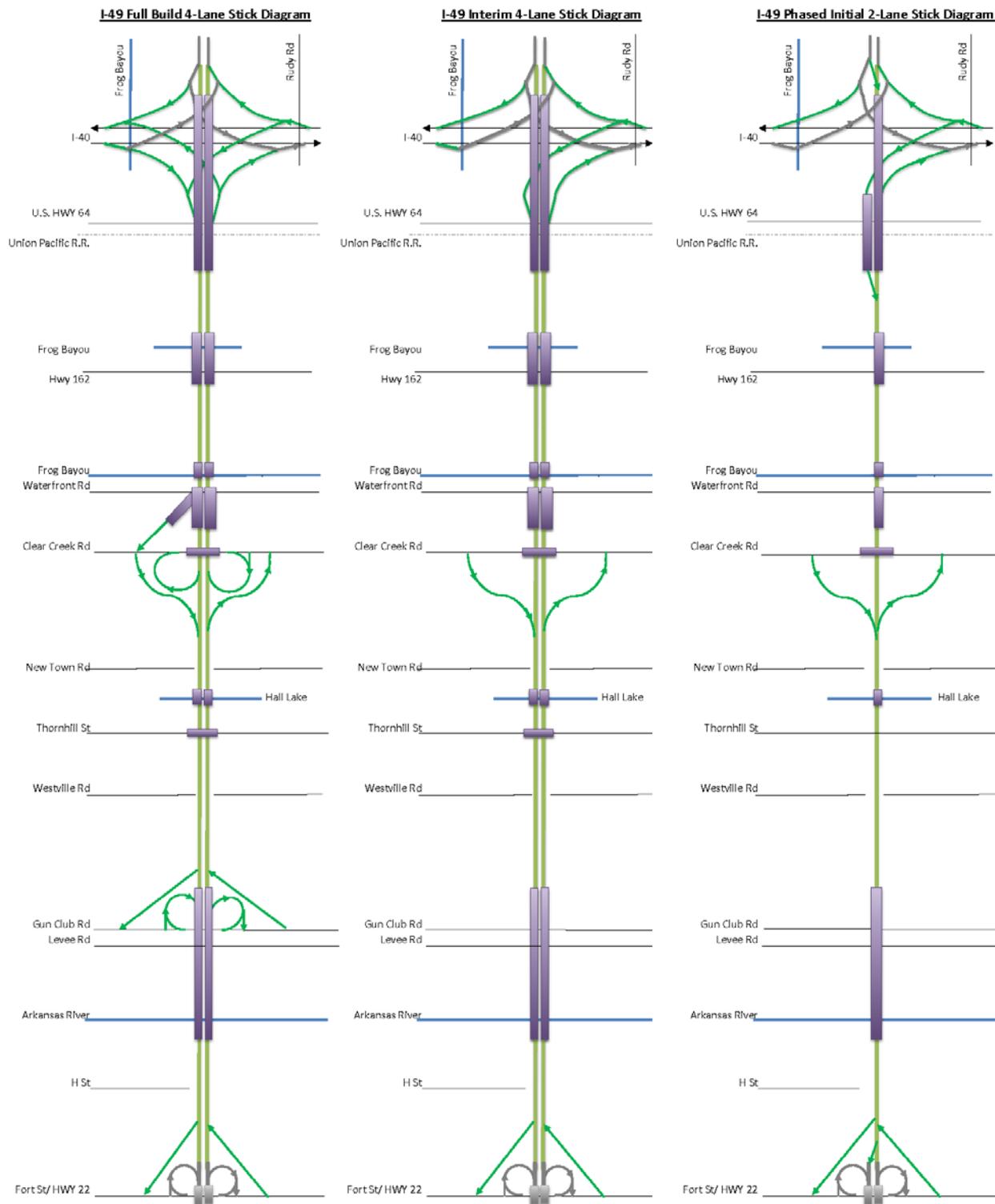
## DESCRIPTION OF THE PROJECT

The proposed ultimate build-out of this project consists of four main lanes (two lanes in each direction); a bridge over the Arkansas River; interchanges at Hwy. 22, Gun Club Road (Rd.), Clear Creek Rd., and I-40; and grade separations at Thornhill Street (St.), Highway 162 (Hwy. 162), Union Pacific Railroad (UPRR), and Highway 64 (Hwy. 64). For the purpose of conducting the toll feasibility analysis, two phasing options in addition to the full build option were considered:

- **Full Build 4-Lane Option** – All elements of the ultimate build-out (described above) would be constructed as a single project.
- **Interim 4-Lane Option** – This option is similar to the Full Build 4-Lane option, except that construction of the following elements would be deferred to one or more future projects: the Gun Club Rd. interchange ramps; the north facing ramps at Clear Creek Rd.; and the northbound-to-westbound and eastbound-to-southbound ramps at the interchange of I-40 and I-49.
- **Phased Initial 2-Lane Option** – This option is similar to the Interim 4-Lane Option, except that only two main lanes would be constructed initially, and construction of the Thornhill Rd. overpass would be deferred, and the speed limit would be 55 miles per hour (mph).

The full build and phasing options are depicted in **Figure 3** and summarized in **Table 1**.

### Figure 3 – Full Build and Phasing Options



**Table 1 – Full Build and Phasing Options**

Element	Full Build 4-Lane	Interim 4-Lane	Phased Initial 2-Lane
Mainlanes	Four – Two lanes in each direction		Two – One lane each direction
Speed Limit	70 mph		55 mph
Arkansas River Bridge	Four lanes		Two lanes
Median	Variable		None
Grade Separations	Thornhill St., Hwy. 162, UPRR & Hwy. 64		Hwy. 162, UPRR & Hwy. 64
Interchange Locations	Hwy. 22, I-40, Gun Club Rd. & Clear Creek Rd.	Complete interchange at Hwy. 22; partial interchange at I-40; and partial interchange at Clear Creek Rd. (south facing ramps only)	
I-40/I-49 Freeway-to-Freeway Ramps	Remaining direct connections for all movements	Northbound-to-westbound and eastbound-to-southbound ramps not included	

**TOLL PLAN**

The proposed project was evaluated as an all-electronic toll facility, which allows for tolling operations to be conducted at highway speeds. There will be no untolled movements in the system. The proposed tolling implementation would include a roadside toll collection system to identify users, a back office system to process toll transactions, and a customer service center to provide customer support and account management services.

# FEASIBILITY ANALYSIS

The feasibility analysis for this project includes a review of the current legislative framework, estimates of project costs, estimates of the traffic and revenue potential of the project, identification of potential finance structures, and an assessment of tolling to finance the project.

## LEGISLATIVE FRAMEWORK

Federal and State tolling statutes provide a framework for development of this project as a toll facility. From a Federal perspective, no issues prevent the implementation of tolls as part of a project to construct a new section of I-49. As a new interstate facility, I-49 can be tolled under the mainstream tolling programs set forth in Title 23 of the United State Code section 129. At the State level, Title 27 of the Arkansas Code establishes the State's legal framework for designing, constructing, financing and operating toll roads. To operate a modern toll facility, the AHC will need to exercise its rulemaking authority to establish necessary policies related to the use of toll revenue, project selection, privacy, data retention, toll rate setting, toll collection, and toll enforcement. In addition, it will be necessary to strengthen State law to allow a broader level of legal actions ARDOT can take regarding toll collection and enforcement such as the use of video for toll collection, as well as collection of fees and penalties from non-compliant road users.

In regards to alternative delivery authority, ARDOT has broad authority to deliver projects using a variety of Public-Private Partnership (P3) models and to create regulations related to P3 delivery. No legislative update is recommended prior to advancing I-49 as a P3 project.

## COST ESTIMATES

The estimated costs to construct, operate, and maintain this segment of I-49 have been prepared and summarized in **Table 2**. The costs associated with tolling are not included in this summary. Project development and construction include activities such as preliminary engineering, right-of-way acquisition, utility relocation, and design-build procurement services. Operations and routine maintenance (O&M) include activities such as inspections, mowing, and snow and ice removal, which occur on a regular basis. Major maintenance and reconstruction (MM) include activities such as bridge joint and slab repair, as well as pavement rehabilitation and reconstruction that are expected to occur in intervals ranging from five to 30 years.

**Table 2 – Estimated Costs without Tolling (\$2018, in millions)**

Phasing Option	Project Development & Construction	Operations & Routine Maintenance	Major Maintenance & Reconstruction
Full Build 4-Lane	\$776	\$58	\$113
Interim 4-Lane	\$734	\$54	\$106
Phased Initial 2-Lane	\$490	\$42	\$73

To account for tolling costs, construction, operation, and maintenance of the roadside toll collection system, back office system, and customer service center were added. Total costs with tolling are shown in **Table 3**. Operations and routine maintenance of toll facilities includes activities such as emergency repair to roadside tolling equipment and the costs associated with transaction processing and customer service. Major maintenance and reconstruction for toll facilities includes periodic replacement of tolling equipment, typically every 10 years.

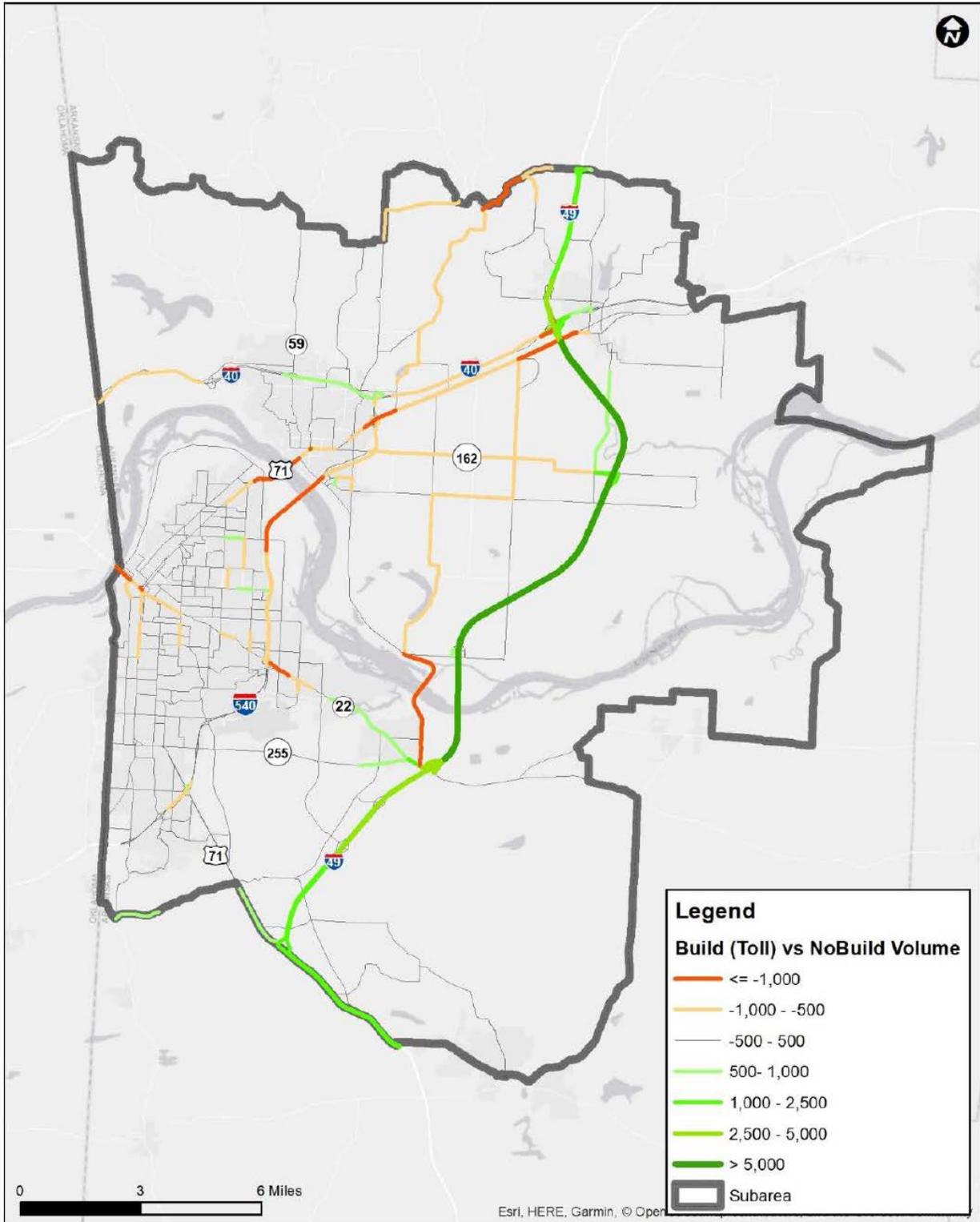
**Table 3 – Estimated Costs with Tolling (\$2018, in millions)**

Phasing Option	Project Development & Construction	Operations & Routine Maintenance	Major Maintenance & Reconstruction
Full Build 4-Lane	\$787	\$118	\$141
Interim 4-Lane	\$742	\$102	\$127
Phased Initial 2-Lane	\$497	\$80	\$93

### TRAFFIC AND REVENUE FORECASTS

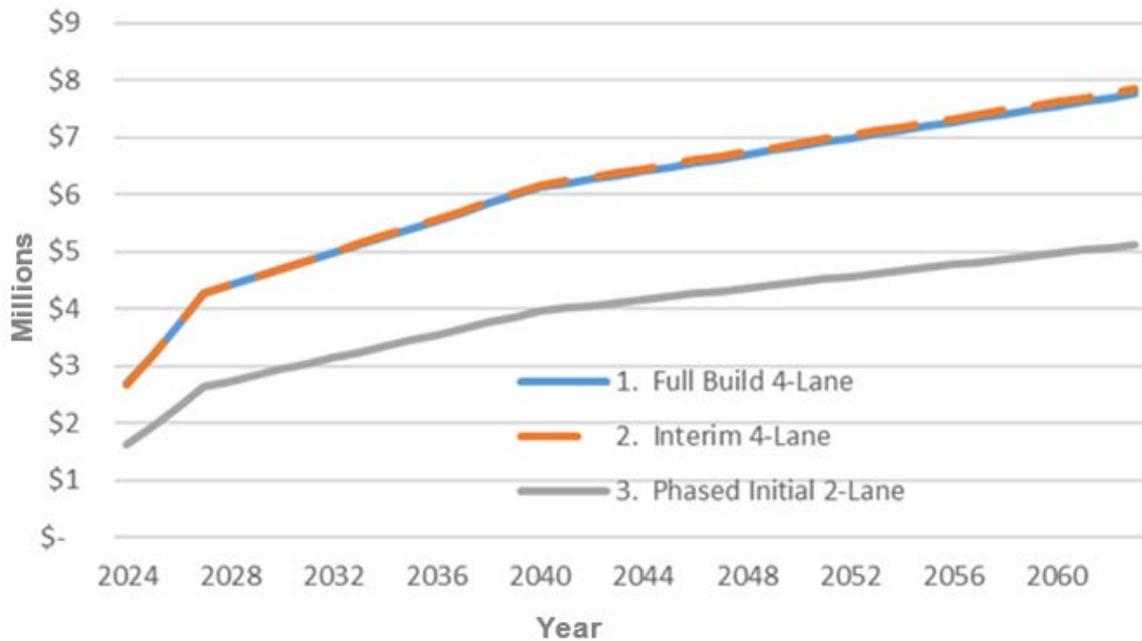
A Traffic and Revenue (T&R) analysis was conducted to understand the revenue potential of tolling the project. An optimum distance-based toll rate of approximately 15 cents per mile was identified, resulting in a proposed toll rate of \$2.00 for the entire length of the project. The anticipated change in traffic volumes in 2040 for the Full Build 4-Lane Option is shown in **Figure 4**.

**Figure 4 – Change in Traffic Volumes under Full Build 4-Lane Option (2040)**



From the proposed toll rate and traffic forecasts, annual- and 40-year gross revenues were estimated, as shown in **Figure 5** and **Table 4**.

**Figure 5 – Annual Gross Revenue by Scenario (\$2018)**



**Table 4 – 40-Yr Gross Toll Revenues (\$2018, in millions)**

Phasing Option	Gross Revenue
Full Build 4-Lane	\$243
Interim 4-Lane	\$244
Phased Initial 2-Lane	\$157

The T&R analysis indicates that the revenue potential for the Full Build 4-Lane and the Interim 4-Lane Phasing Options is essentially the same, but significantly greater than the revenue potential of the Phased Initial 2-Lane Phasing Option.

## INITIAL FINANCIAL FEASIBILITY RESULTS

Financial analyses were conducted to assess the capacity of the project’s toll revenues to support its initial construction costs and on-going operations and maintenance. A summary of the estimated revenues and costs for the project are shown in **Table 5**.

Regardless of phasing, anticipated toll revenues fall well short of estimated costs, with a total gap of between \$513 million and \$803 million. Thus, tolling cannot contribute substantially to the upfront costs of constructing the project.

**Table 5 – 40-Year Toll Revenue and Expenditure Summary (\$2018, in millions)**

Revenue/Cost Item	Full Build 4-Lane	Interim 4-Lane	Phased Initial 2-Lane
Toll Revenues	\$243	\$244	\$157
Project Development & Construction	\$787	\$742	\$497
Operations & Routine Maintenance	\$118	\$102	\$80
Major Maintenance & Reconstruction	\$141	\$127	\$93
Net	(\$803)	(\$727)	(\$513)

## FINANCE STRUCTURES

Following the initial financial feasibility assessment, a more detailed analysis was conducted to determine the potential upfront financing proceeds based on capital market requirement and three alternative financing structure scenarios. All financing structure scenarios are based on a gross revenue pledge. With a gross revenue pledge, ARDOT would pledge to fund routine operations and maintenance, as well as major maintenance and reconstruction costs that could not be funded from toll revenues.

Primary financing assumptions for the three financing structure scenarios are summarized in **Table 6**.

**Table 6 – Financing Scenario Assumptions**

Item	Gross Revenue Pledge Less Toll O&M Costs	Pure Gross Revenue Pledge	Fully Guaranteed Gross Revenue Pledge
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<b>ARDOT Risk</b>	Tolling MM; Roadway O&M and MM	Tolling O&M and MM; Roadway O&M and MM	Tolling O&M and MM; Roadway O&M and MM; Debt Service
<b>Debt Description</b>	40 years; CIBs & CABs, Capitalized Interest, Reserve Funds, Costs of Issuance	40 years; CIBs & CABs, Capitalized Interest, Reserve Funds, Costs of Issuance	40 years; CIBs & CABs, Capitalized Interest, Reserve Funds, Costs of Issuance
<b>Toll Bond Rate</b>	4.00% – 5.00%	4.00% – 5.00%	3.50% – 4.50%
<b>Coverage</b>	1.75x – 2.00x	1.75x – 2.00x	1.25x – 1.50x
<b>Illustrative Rating</b>	BBB category	BBB category	A or AA category
Note: Current Interest Bond (CIB) – returns paid on a periodic basis Capital Appreciation Bond (CAB) – the principal plus return paid at maturity			

A proprietary financial model was used to assess the upfront financing capacity for the financing structure scenarios. As **Table 7** demonstrates, toll financing can contribute some upfront proceeds and can cover all routine tolling and roadway operations, as well as maintenance expenses. However, none of these scenarios will produce adequate revenue to cover all expenses. More specifically, with the initial capital cost of nearly \$800 million, none of these financing scenarios could contribute significantly to the upfront capital costs of the project.

**Table 7 – Potential Upfront Financing Proceeds (Full Build 4-Lane Option)  
(\$2018, in millions)**

<b>Item</b>	<b>Gross Revenue Pledge Less Toll O&amp;M Costs</b>	<b>Pure Gross Revenue Pledge</b>	<b>Fully Guaranteed Gross Revenue Pledge</b>
Roadway Costs	\$776		

Tolling Costs	\$11		
<b>TOTAL CAPITAL COST</b>	<b>\$787</b>		
<b>UPFRONT FINANCING PROCEEDS</b> Toll Revenue Bond Financing	\$44 – \$64	\$53 – \$77	\$79 – \$119
<b>Remaining Funding Gap</b>	<b>\$723 – \$743</b>	<b>\$710 – \$734</b>	<b>\$668 – \$708</b>
Notes:			
1. Financing in year 30 could be used for major maintenance.			
2. Transportation Infrastructure Finance and Innovation Act (TIFIA) loan was not included in these models, but could produce additional upfront proceeds.			

## CONCLUSION

The completion of I-49 through Arkansas would connect western Arkansas to the Interstate Highway System. Construction of the segment of I-49 from Highway 22 to I-40 represents a critical step towards completing this High Priority Corridor and would improve the movement of people and goods throughout the region by providing an additional crossing over the Arkansas River. However, there are significant costs to implement this project.

While ARDOT does have the legislative authority to toll this facility, the traffic and revenue forecasts prepared for this study indicate that toll revenues could only cover the costs for operations, routine maintenance, and a portion of the major maintenance and reconstruction costs. Thus, implementation of this project would require a significant infusion of additional (non-toll) capital resources. With an upfront funding gap of approximately \$700 million, a public-private partnership (P3) based on tolling of this segment of Interstate 49 is not a viable option at this time.



# APPENDIX A

## MINUTE ORDER 2016-092

### ARKANSAS STATE HIGHWAY COMMISSION

### MINUTE ORDER

District: Four

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County: Sebastian and Crawford

Category: Improvement Project-Arkansas Primary Highway Network (APHN)

**WHEREAS, IN SEBASTIAN AND CRAWFORD COUNTIES,** the alignment for the Future Interstate 49 segment between Highway 22 and Interstate 40 was approved by the Federal Highway Administration in August 1997; and

**WHEREAS,** completion of this segment will provide a continuous interstate facility from U.S. Highway 71 south of Fort Smith to U.S. Highway 71 in Bentonville; and

**WHEREAS,** the Statewide Transportation Improvement Program for Federal Fiscal Years 2016-2020 includes \$10 million to begin project development activities for this improvement; and

**WHEREAS,** due to the high cost of constructing over 13 miles of interstate on new location, which will include a bridge over the Arkansas River, it is reasonable for the Department to explore the possibility of a public/private partnership to increase limited available funds; and

**WHEREAS,** consultant services are needed to supplement Department staff availability and expertise to provide a reassessment of the 1997 Environmental Impact Statement, to do a conceptual and preliminary design for more accurate cost estimating, to conduct a toll feasibility analysis, and to determine whether this proposed freeway segment is a viable candidate for the Design/Build/Maintain project delivery method.

**NOW THEREFORE,** the Director is authorized to solicit proposals from qualified firms and enter into a contract to provide the necessary project development services as listed above.

Approved:   
Chairman  
  
Vice-Chairman  
  
Member  
  
Member  
  
Member  
DD-COO

Submitted By:   
Deputy Director and Chief Operating Officer  
Approved:   
Director  
Minute Order No. **2016 092**  
Date Passed **SEP 14 2016**

Form 19-456  
Rev. 1/13/2016