ARDOT Job 070442

HWY. 67 - HWY. 51 (ARKADELPHIA BYPASS) P.E.

Environmental Assessment

September 2020

U.S. Department of Transportation
Federal Highway Administration

Arkansas Department of Transportation

HWY. 67 TO HWY. 51 (ARKADELPHIA BYPASS) P.E.

ARDOT Job 070442; F.A.P. Number STPC-9013(10)

Environmental Assessment

Randal Looney
Environmental Coordinator
Federal Highway Administration

Submitted pursuant to:

The National Environmental Policy Act
42 U.S.C. §4322(2)(c) and 23 C.F.R. §771

Submitted by:

FEDERAL HIGHWAY ADMINISTRATION

and

ARKANSAS DEPARTMENT OF TRANSPORTATION

September 30, 2020
Date of Approval

U.S. Department of Transportation
Federal Highway Administration

Prepared by:

Garver, North Little Rock, Arkansas

The following people may be contacted for additional information concerning this document:

Randal Looney
FHWA
700 W. Capitol, Room 3130
Little Rock, AR 72201-3298
(501) 324-6430

John Fleming
ARDOT
P.O. Box 2261
Little Rock, AR 72203-2261
(501) 569-2281

In compliance with the National Environmental Policy Act, this Environmental Assessment describes the proposed project to provide a bypass from Highway 67 to Highway 51 in the City of Arkadelphia. The analysis did not identify any significant adverse environmental impacts.

Comments should be directed to:

Mail: Garver
Attn: Jon Hetzel
4701 Northshore Drive
North Little Rock, AR 72118

Email: PublicInvolvement@GarverUSA.com

This Environmental Assessment is also available for review online at: http://www.arkansashighways.com/

Americans with Disabilities Act (ADA) Information

Materials can be provided in alternative formats: large print, Braille, or audiotape for people with disabilities by contacting ARDOT's EEO/DBE Section Head (ADA/504/Title VI Coordinator) at (501) 569-2298 (Voice/TTY 711), P.O. Box 2261, Little Rock, AR 72203, or at the following email address: joanna.mcfadden@ardot.gov. Persons who are deaf or hard of hearing may contact the ARDOT through the Arkansas Relay Service at 7-1-1.

Title VI

The Arkansas Department of Transportation (ARDOT) ensures full compliance with Title VI of the *Civil Rights Act* of 1964 by prohibiting discrimination against any person on the basis of race, color, national origin or sex in the provision of benefits and services resulting from its federally assisted programs and activities. The ARDOT public involvement process did not exclude any individuals due to income, race, color, religion, national origin, sex, age, or disability. For questions regarding the ARDOT's Title VI Program, you may contact the Department's EEO/DBE Section Head (ADA/504/Title VI Coordinator) at (501) 569-2298 (Voice/TTY 711), P.O. Box 2261, Little Rock, AR 72203, or at the following email address: joanna.mcfadden@ardot.gov.

A federal agency may publish a notice in the Federal Register, pursuant to 23 USC §139(l), indicating that one or more federal agencies have taken final action on permits, licenses, or approvals for a transportation project. If such notice is published, claims seeking judicial review of those federal agency actions will be barred unless such claims are filed within 180 days after the date of publication of the notice, or within such shorter time period as is specified in the federal laws pursuant to which judicial review of the federal agency action is allowed. If no notice is published, then the periods of time that otherwise are provided by the federal laws governing such claims will apply.

TABLE OF CONTENTS

CHAPTERS

Chapter 1 – Purpose and Need 1
1.1 What is the Arkadelphia Bypass project? 1
1.2 What are the existing conditions in the project area? 1
1.3 Why is the Arkadelphia Bypass needed? 7
1.4 How is the project related to other transportation plans and goals? 10
1.5 What is the purpose of this project? 11
1.6 What is the purpose of this Environmental Assessment? 11
1.7 Who is leading this project? 11

Chapter 2 – Alternatives 12
2.1 What are the project limits and why were they chosen? 12
2.2 How were alternatives developed? 12
2.3 What alternatives are evaluated in this EA? 15
2.4 How well would each alternative improve mobility and how much would each cost? 24
2.5 How has the public been involved? 25
2.6 How have government agencies been involved? 26
2.7 How have tribal governments been involved? 26

Chapter 3 – Environmental Impacts and Mitigation 27
3.1 How were potential impacts evaluated? 27
3.2 Would the project require any relocations or right of way acquisitions? 27
3.3 How would the project affect the community? 31
3.4 Would noise levels change? 34
3.5 How would the project affect parks and recreation areas? 35
3.6 How would the project area's visual quality be affected? 37
3.7 Will any historic properties be affected by the project? 39
3.8 How would water resources, wetlands, streams, and floodplains be impacted? 40
3.9 How would wildlife and protected species be affected by the project? 43
3.10 Would any Prime Farmland be impacted by the project? 46

3.11 Are there any hazardous materials, wastes, or contaminated sites in the project area? 48
3.12 Does the project have any indirect effects? 50
3.13 Does the project have any cumulative impacts? 53
3.14 What resources are either not present or not affected? 54

Chapter 4 – Results and Recommendations 55
4.1 What are the results of this EA? 55
4.2 What commitments have been made? 55
4.3 Is the NEPA process finished? 58

Chapter 5 – References 59

FIGURES

Figure 1: Project Area 2
Figure 2: Existing Transportation Network 3
Figure 3: Problem Intersections 4
Figure 4: I-30/Hwy. 51 Interchange Area 6
Figure 5: Location of Routes Listed in Table 1 9
Figure 6: Initial Bypass Alternatives Considered 13
Figure 7: Initial Interchange Alternatives Considered 14
Figure 8: West Bypass Alternatives A, B, and H 17
Figure 9: Typical Section of Alternatives A, B, G, and H 18
Figure 10: Typical Section of Alternative H Ramps and Interchange Alternatives 1, 1A, 2, and 3 18
Figure 11: Alternative H Improvements Near the I-30/Hwy. 51 Interchange 19
Figure 12: East Bypass Alternatives D, F, and G 21
Figure 13: Typical Section of Alternatives D and F 22
Figure 14: Interchange Alternative 1A 23
Figure 15: Land Cover Types Converted by Each Alternative 29
Figure 16: Potential Low-Income Areas 32
Figure 17: Arkadelphia Riverfront Park 36
Figure 18: Wetlands, Streams, and Floodplains within Project Site 41
Figure 19: Acres of NLCD Habitat Types* Impacted within each Build Alternative 45
Figure 20: Acres of Prime Farmland or Farmland of Statewide Importance to be Converted 47
Figure 21: Hazardous Material and Hazardous Waste Sites 49
Figure 22: Areas Expected by City to Experience Induced Growth as a Result of the Project 52

TABLES

Table 1: Annual Average Crash Rates (2015-2017); See Figure 5 for Color-Coded Routes 8
Table 2: Cost Estimate in 2019 Dollars 24
Table 3: Preliminary ROW and Relocations Required for Each Alternative 28
Table 4: Land Cover Types to be Converted to Highway ROW 28
Table 5: Wetland, Stream, and Floodplain Impacts 42
Table 6: Preliminary Impact Table for Federally-Listed Species 44
Table 7: Summary of Impacts for Bypass Alternatives 56
Table 8: Summary of Impacts for Interchange Alternatives 57

APPENDICES

Appendix A: Arkadelphia Bypass Traffic Study

Appendix B: Public Involvement Synopsis

Appendix C: Agency and Tribal Coordination

Appendix D: Conceptual Stage Relocation Study

Appendix E: Noise Screening

Appendix F: Visual Impact Assessment

Appendix G: Cultural Resources

Appendix H: Wetlands Assessment

Appendix I: Protected Species

Appendix J: Cumulative and Indirect Impacts

ACRONYMS

AASHTO	American Association of State Highway Transportation Officials
ADA	Americans with Disabilities Act
ADEQ	Arkansas Department of Environmental Quality
ADH	Arkansas Department of Health
ADT	Average Daily Traffic
AHPP	Arkansas Historic Preservation Program
ANHC	Arkansas Natural Heritage Commission
ARAS	Arkansas Archeological Survey
ARDOT	Arkansas Department of Transportation
ASC	American Community Survey
AST	Aboveground Storage Tank
BMP	Best Management Practice

CBD	Central Business District
CWA	Clean Water Act
EA	Environmental Assessment
EIS	Environmental Impact Statement
EJ	Environmental Justice
EPA	Environmental Protection Agency
FAP	Federal Aid Project
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
HUC	Hydrologic Unit Code
LOS	Level of Service
LUST	Leaking Underground Storage Tank
LWCF	Land and Water Conservation Fund
MVM	Million Vehicle Miles
NAC	Noise Abatement Criteria
NEPA	National Environmental Policy Act
NLEB	Northern Long-eared Bat
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
OSHA	Occupational Safety and Health Administration
PCBs	Polychlorinated Biphenyls
ROW	Right of Way
RSA	Resource Study Area
SHPO	State Historic Preservation Officer
SWPPP	Stormwater Pollution Prevention Plan
UPRR	Union Pacific Railroad
USACE	U.S. Army Corps of Engineers
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service
UST	Underground Storage Tank
VPD	Vehicles per Day

Chapter 1 – Purpose and Need

Chapter 1 describes current transportation problems, explains how the proposed project could resolve these problems, and outlines the project's lead agency roles.

1.1 What is the Arkadelphia Bypass project?

The Arkansas Department of Transportation (ARDOT) is proposing to construct a bypass and modify the Interstate 30 (I-30) and Highway (Hwy.) 51 interchange (I-30/Hwy. 51 interchange) in the City of Arkadelphia to improve safety, mobility, and connectivity. The project area is shown in **Figure 1**.

Mobility is the easy movement of people and goods through an area. **Connectivity** refers to the number and directness of routes and roadways. Good connectivity is provided by multiple routes and connections serving the same origins and destinations. Mobility and connectivity improvements increase traffic flow and roadway capacity.

1.2 What are the existing conditions in the project area?

Located in Clark County, Arkadelphia is an economic center in southwest Arkansas that hosts a substantial volume of commercial traffic, including large trucks. Arkadelphia is also an educational center due to the presence of Henderson State University and Ouachita Baptist University. Clark County and Arkadelphia have populations of approximately 22,385 and 10,611, respectively (U.S. Census Bureau, 2018).

The existing transportation network in the project area is shown in **Figure 2**. The Central Business District (CBD) lies at the crossroads of Hwys. 51 and 67. Interstate 30 is located along the western edge of the city.

Arkadelphia's Central Business District (CBD) is generally located southeast of the Hwy. 51/Hwy. 67 intersection (Figure 2) and is the hub of Arkadelphia's business and social life. This area is home to many offices, government facilities, restaurants, and retail establishments.

Hwy. 51 is the primary east-west traffic corridor through Arkadelphia and provides the only Ouachita River crossing in the region. Hwy. 8 runs concurrent with Hwy. 51 through the project area, as does a short segment of Hwy. 7 east of the CBD. Hwy. 51 is also designated as Pine Street (St.) from 6th St. to west of I-30, and as Caddo St. from 10th St. to 1st Street. Within the project area, Hwy. 51 consists of two travel lanes ranging from 12 to 15 feet in width, lacks shoulders, and has curb and gutter. A bridge carrying Hwy. 51 over the Ouachita River and the Union Pacific Railroad (UPRR) was completed in 2018. Hwy. 51 is scheduled to be widened along the light green-colored section of the roadway shown in Figure 2 to two 12-foot travel lanes, a 12-foot two-way center turn lane, and curb and gutter. Three problem intersections with difficult turns are present along Hwy. 51; **Figure 3** provides a detailed view of these intersections. Hwy. 51 is approximately 2.8 miles in length between I-30 and the Ouachita River bridge and there is a 30-35 miles per hour (mph) posted speed limit along this segment of highway.

A **difficult turn** is considered to be a 90 degree turn at an intersection that does not have the proper design criteria for the size of the turning vehicle. These difficult turns result in what are referred to as **problem intersections** near the CBD.

Figure 1: Project Area

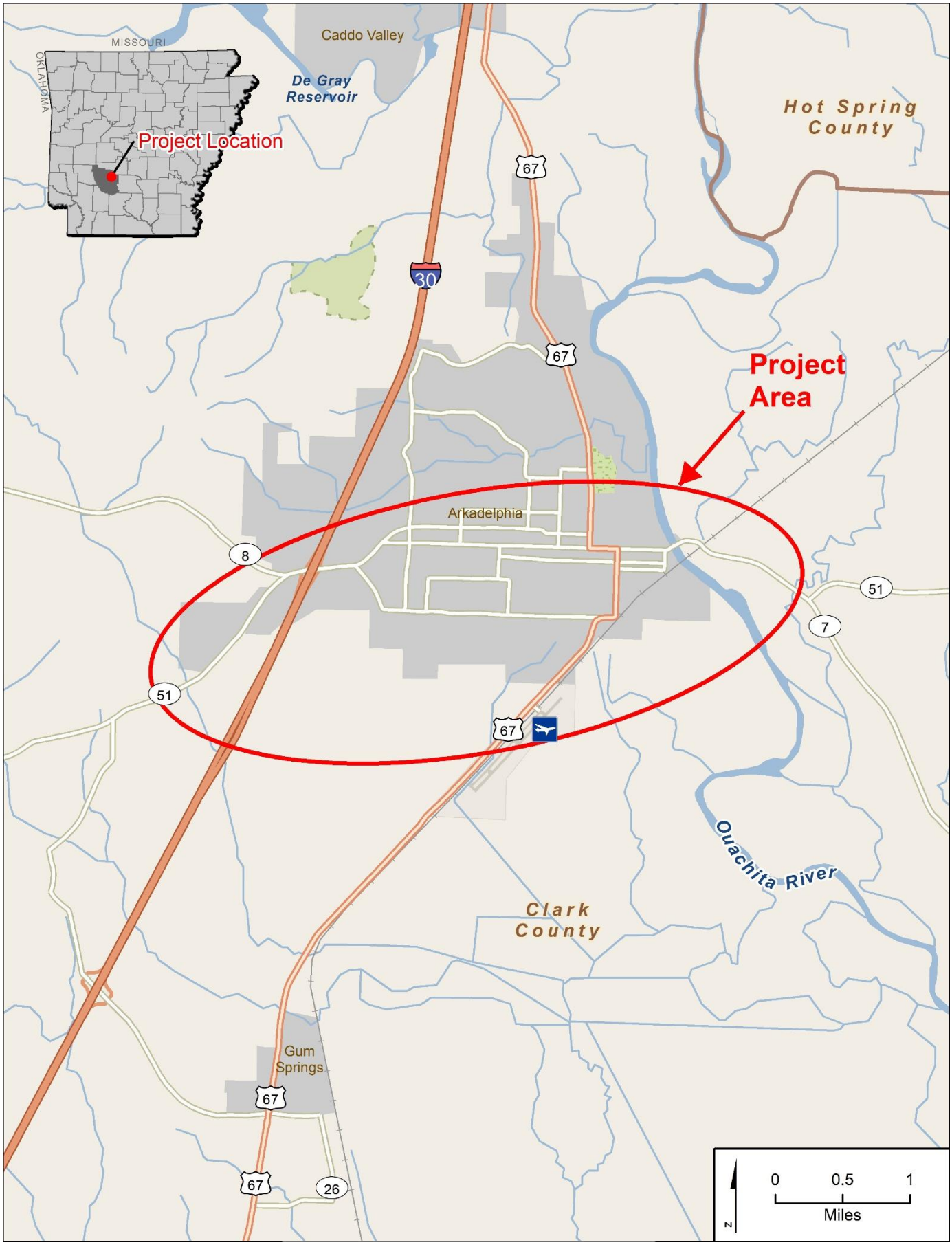


Figure 2: Existing Transportation Network

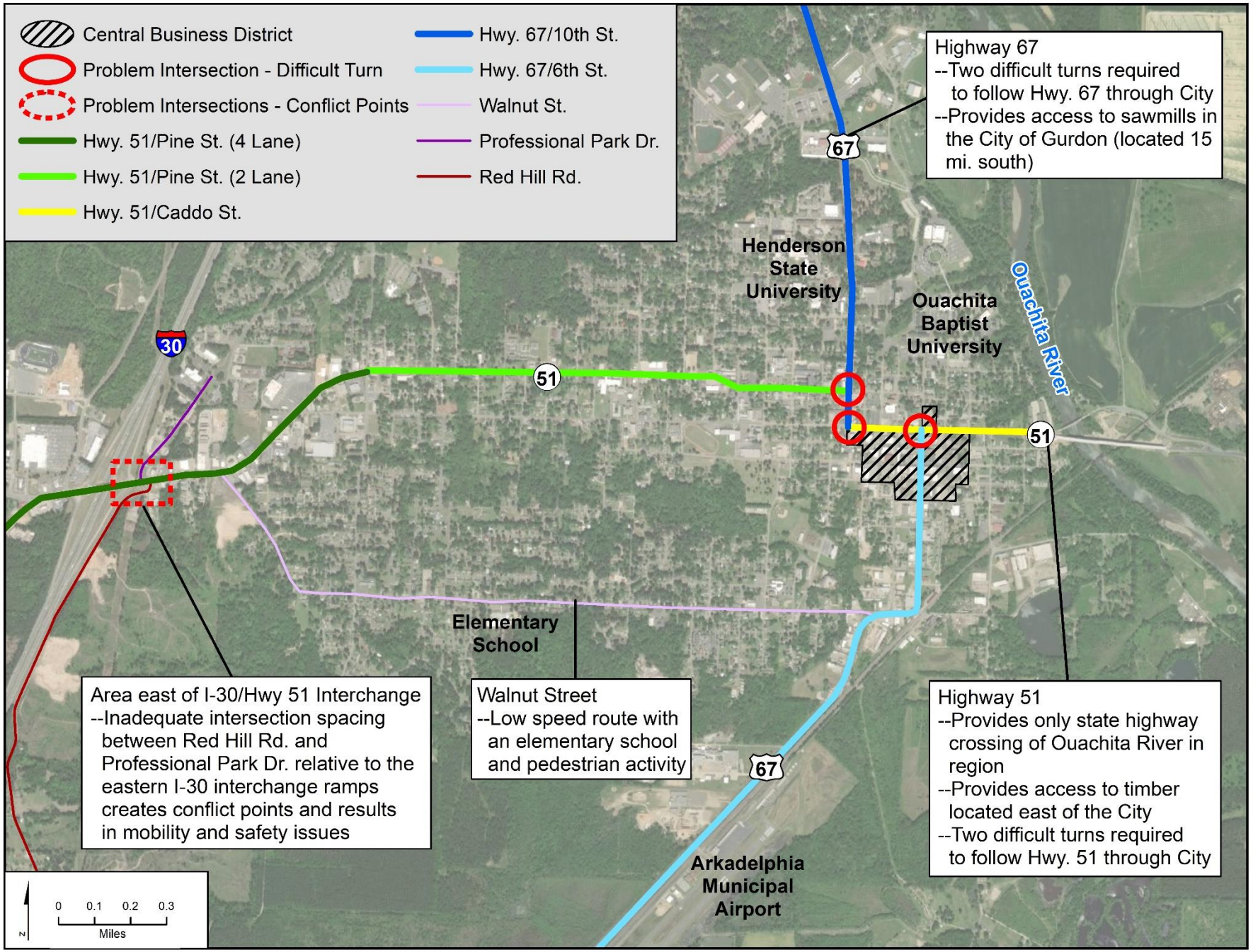
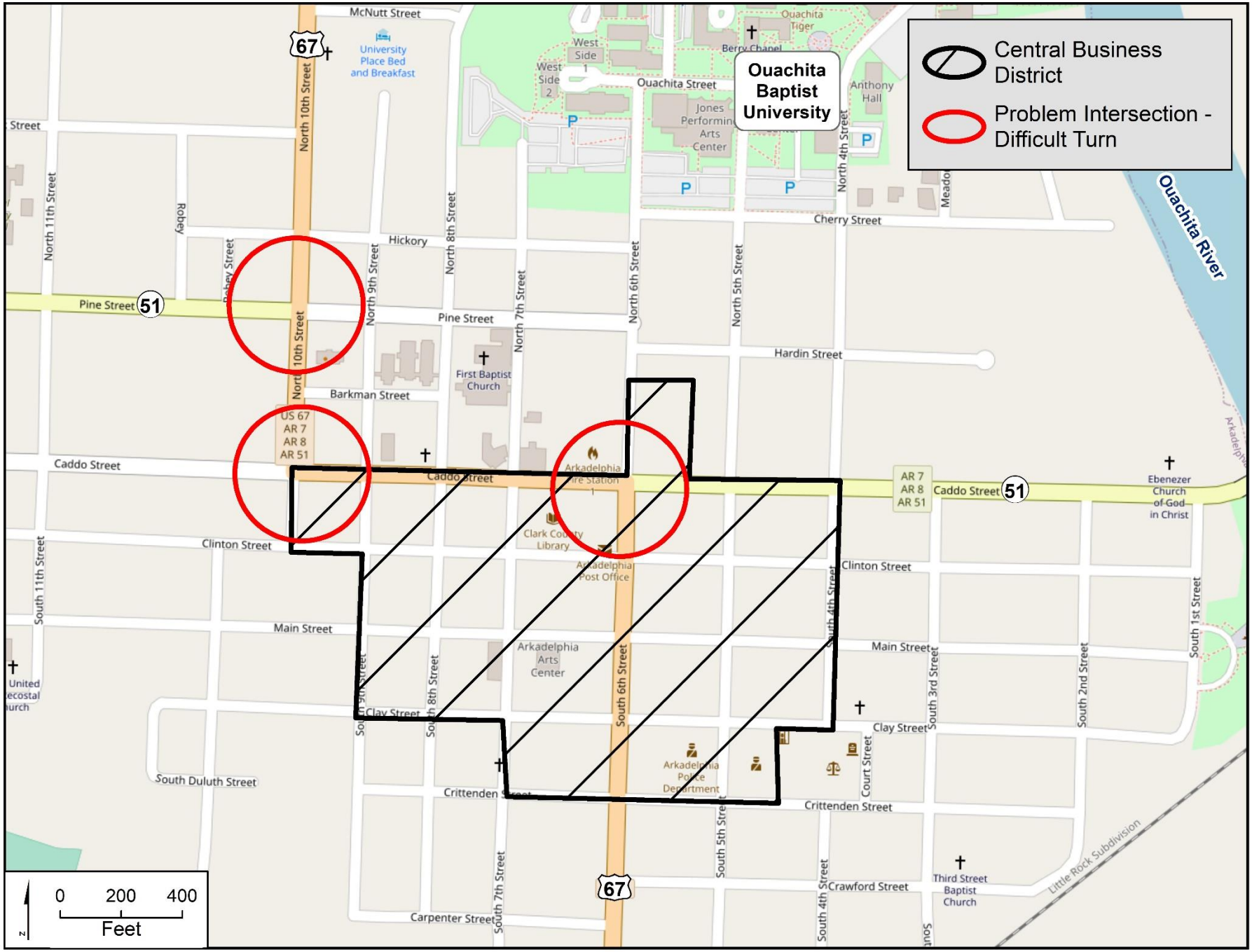


Figure 3: Problem Intersections



Hwy. 67 is a primary north-south traffic corridor, and Hwy. 7 runs concurrent with it from Arkadelphia to I-30. Hwy. 67 is also designated as 10th St. north of the CBD, as Caddo St. between 10th St. and 6th St., and as 6th St. between Hwy. 51 and Walnut Street. Within the project area, Hwy. 67 consists of two travel lanes ranging from 12 to 15 feet in width, lacks shoulders, and has curb and gutter. Hwy. 67 contains the same three problem intersections as Hwy. 51, as these two highways run concurrent with each other in these locations. Hwy. 67 is approximately 1.8 miles in length between Hwy. 51 and the Arkadelphia Municipal Airport and there is a 30 mph posted speed limit along this segment of highway.

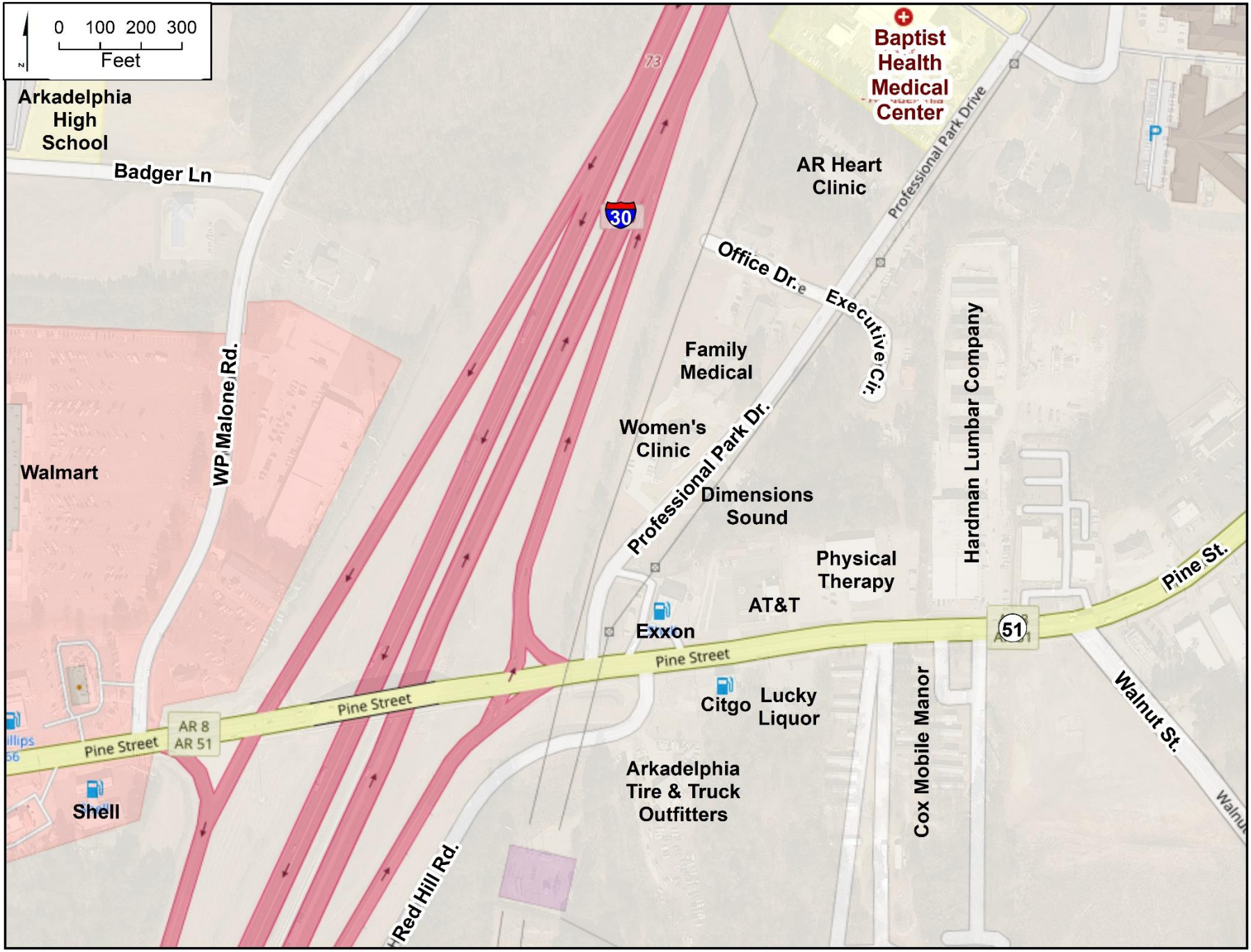
Walnut St. runs parallel to a segment of Hwy. 51 and connects Hwys. 51 and 67. This roadway has two 11 to 12-foot wide travel lanes, lacks shoulders, and is not a good traffic conductor due to slow speeds, the presence of an elementary school, and pedestrian activity. Walnut St. is approximately 2.0 miles in length between Hwy. 51 and Hwy. 67 and there is a 30 mph posted speed limit along this segment of roadway.

I-30, which roughly parallels Hwy. 67 through the project area, has two 12-foot wide travel lanes in each direction, a divided grass median, and approximately 10-foot wide paved outside shoulders. There is a 70 mph posted speed limit for I-30 and logging trucks are prohibited. The **I-30/Hwy. 51 interchange** has a diamond interchange configuration. The area immediately east of the interchange is identified as having problem intersections due to the inadequate intersection spacing between Professional Park Drive (Dr.) and Red Hill Road (Rd.) relative to the eastern I-30 interchange ramps. **Figure 4** provides a detailed view of this interchange area.

Professional Park Dr. ties into Hwy. 51 from the north and is located between the I-30 on ramp and the driveway for an Exxon gasoline station. Near its stop-sign controlled intersection with Hwy. 51, Professional Park Dr. consists of two travel lanes ranging from 12 to 14 feet in width, a 12-foot wide right-turn lane onto Hwy. 51, lacks shoulders, and has curb and gutter. Farther north of the Hwy. 51/Professional Park Dr. intersection, Professional Park Dr. consists of two 18-foot wide travel lanes, lacks shoulders, has curb and gutter, and includes a 5-foot wide sidewalk along the west side of the road. No speed limit is posted for this roadway within the project area.

Red Hill Rd. ties into Hwy. 51 from the south and is located between the I-30 on ramp and the driveway for a Citgo gasoline station. Near its stop-sign controlled intersection with Hwy. 51, Red Hill Rd. consists of two 12-foot wide travel lanes, 18-foot wide right-turn and left-turn lanes onto Hwy. 51, lacks shoulders, and has curb and gutter. Farther south of the Hwy. 51/ Red Hill Rd. intersection, Red Hill Rd. consists of two 10-foot wide travel lanes and lacks shoulders. No speed limit is posted for this roadway within the project area.

Figure 4: I-30/Hwy. 51 Interchange Area



1.3 Why is the Arkadelphia Bypass needed?

Several ARDOT planning studies have identified the CBD and the east side of the I-30/Hwy. 51 interchange as areas in Arkadelphia where safety and mobility are inadequate. These studies include the 2006 Arkadelphia Truck Route Study, 2013 Arkadelphia Bypass Study, and the 2020 Arkadelphia Bypass Traffic Study. The safety, mobility, and connectivity deficiencies detailed in **Appendix A** are summarized below.

Safety is of primary importance to agencies responsible for constructing and maintaining our nation's roadways

Safety Analysis

Crash Rates

The relative safety of a route can be determined by comparing the crash rate in crashes per million vehicle miles (MVM) traveled to a statewide average for similar routes.

The Arkadelphia Bypass Traffic Study evaluated crash rates from 2015-2017 for roadways in the project study area. The study results indicated that crash rates on each of these roadway segments were above the statewide average (see **Table 1** and corresponding **Figure 5**). Crash rates are highest along Hwy. 51, which has congested intersections, difficult turns, and frequent stop-and-go traffic conditions. Difficult turns are present within and near the CBD because the Hwy. 51 roadway geometry is restrictive, and large trucks (particularly logging trucks) have difficulty making turning maneuvers. The presence of large trucks creates safety concerns because, while making a turn, the rear wheels often run over the curbs and onto the sidewalk due to the small turning radii at these intersections. Additionally, truck drivers typically have to pull into the opposing lane of traffic to complete the turn, causing the opposing traffic to back up to allow the truck the room to make the turn.

Large trucks include all trucks 10,000 lbs. and up.

The study results also revealed a relatively high number of crashes at the unsignalized intersections of Hwy. 51 between the I-30 northbound ramp and Professional Park Drive. The high number of crashes in this area is likely due to the numerous conflict points on Hwy. 51 east of the I-30/Hwy. 51 interchange. Conflict points on roadways, such as driveways and street intersections, are associated with an increase in crash risk. When conflict points are numerous and dense, drivers have more information to process and less time to react to unexpected situations. As travel volumes increase, the safety performance of roadways with numerous conflict points can be poor.

Conflict points are where a roadway user can cross, merge, or diverge with another roadway user.

Pedestrian Safety

The CBD's many businesses and restaurants attract a large number of pedestrians. Pedestrian crossings therefore occur throughout the CBD, including at Hwys. 51 and 67. Both of these highways experience commercial traffic, including large trucks. The presence of trucks presents safety concerns for pedestrians.

Table 1: Annual Average Crash Rates (2015-2017); See Figure 5 for Color-Coded Routes

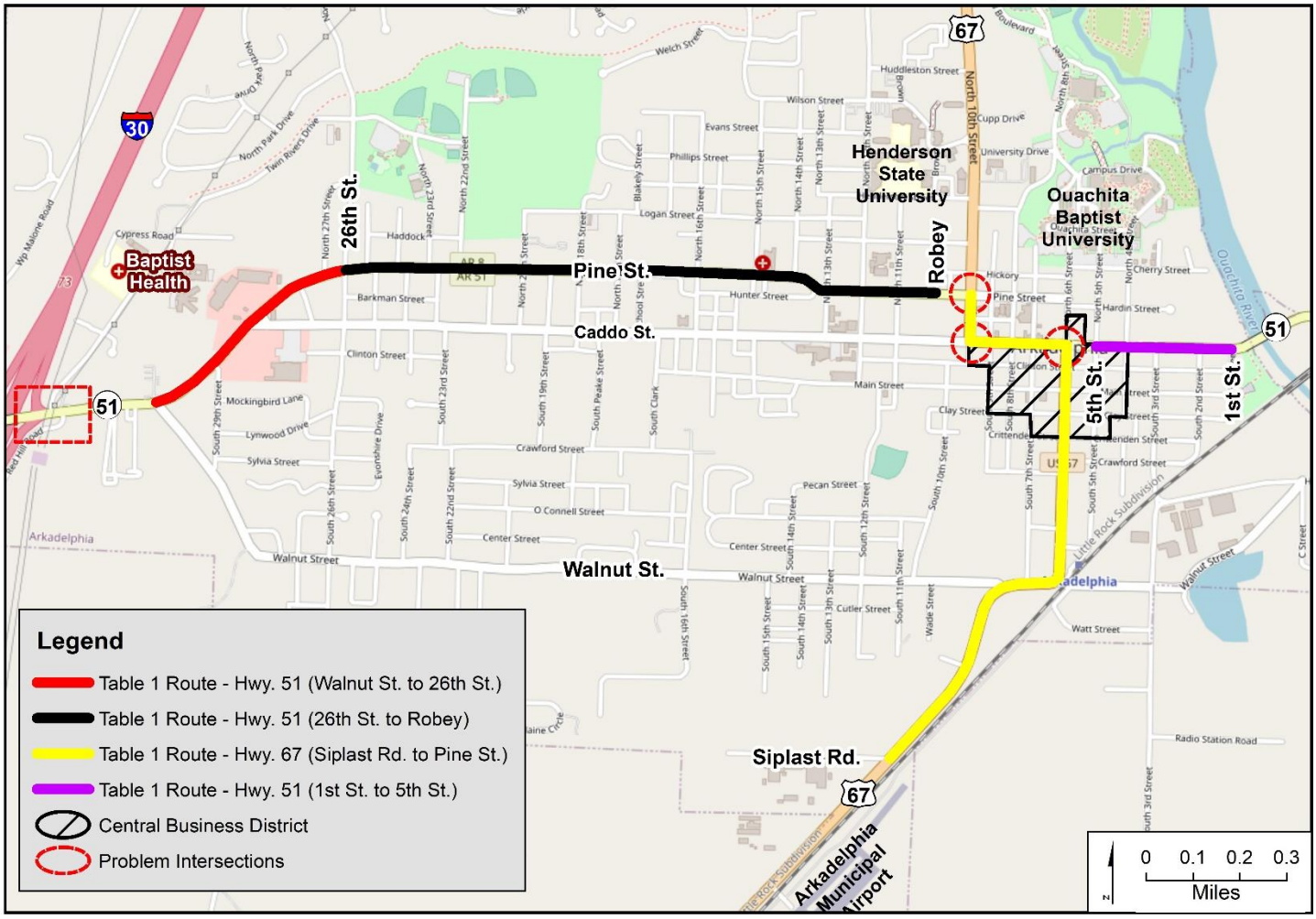
Route	Segment Length (mi.)	Weighted ADT[2]	All Crashes			KA Crashes [1]		
			No. of Crashes	Crash Rate (per 100 MVM)[3]	Statewide Average (per 100 MVM)[3]	No. of Crashes	Crash Rate (per 100 MVM)[4]	Statewide Average (per 100 MVM)[4]
Hwy. 51 (Walnut St. to 26th St.)	0.93	13,000	60	4.53	3.98[5]	2	0.15	7.88
Hwy. 51 (26th St. to Robey)	1.27	9,000	47	3.76	2.48[6]	0	0	9.55
Hwy. 67 (Siplast Rd. to Pine St.)	1.38	6,700	27	2.67	2.48[6]	0	0	9.55
Hwy. 51 (1st St. to 5th St.)	0.51	3,400	8	4.21	2.48[6]	0	0	9.55

[1] KA Crashes are defined as either fatal or serious injury crashes
[2] Average Daily Traffic (ADT)
[3] Crash rates reported in crashes per million vehicle miles (MVM)
[4] KA crash rates reported in crashes per 100 million vehicle miles (MVM)
[5] Statewide average crash rate for four-lane undivided highways, no control of access
[6] Statewide average crash rate for two-lane undivided highways, no control of access

Safety Near the I-30/Hwy. 51 Interchange

The minimum recommended distance between the I-30 ramps and the closest road or driveway connection is 300 feet per published interstate design standards (AASHTO, 2016). Professional Park Dr. is approximately 180 feet from the I-30 ramp and is, therefore, not meeting current design criteria. This insufficient distance between the I-30 ramp and Professional Park Dr. decreases vehicular safety and is further exacerbated by several surrounding conflict points created by adjacent driveways and Red Hill Road. Furthermore, the intersection of Hwy. 51 and Professional Park Dr. is controlled by a stop sign on Professional Park Drive. Left turning vehicles at this intersection must yield to oncoming traffic. Due to limited gaps in traffic, left turning vehicles often stack up in both the Hwy. 51 and Professional Park Dr. travel lanes. Rear-end collisions are more likely to occur as vehicles waiting to make left turns stack up in the travel lanes. The intersection of Hwy. 51 and Professional Park Dr. is especially problematic because Professional Park Dr. is the main access for emergency vehicles going to or leaving from the Baptist Hospital (Figure 4). When traffic backs up, emergency vehicles are impeded and/or emergency response times delays occur, creating public safety concerns.

Figure 5: Location of Routes Listed in Table 1



For the reasons described above, providing an alternate route around the CBD would increase both vehicular and public safety by reducing crash rates, creating safer pedestrian conditions, and improving the I-30/Hwy. 51 interchange.

Mobility

CBD Mobility

With Hwy. 67 running north and south and Hwy. 51 running east and west, the two highways converge in the CBD at the intersection of Caddo St. and 10th Street (Figure 3). Consequently, both local and through traffic also converge in the CBD. Trucks comprise up to 5% of the through traffic vehicle mix on Hwys. 51 and 67, which are primary routes through Arkadelphia. The timber industry is one of the largest sectors of the regional economy and a number of processing mills operate within 40 miles of Arkadelphia. Hwy. 67 is regularly used by logging trucks traveling to the processing mills in Gurdon, located approximately 15 miles south of Arkadelphia. Because they are prohibited on interstates, logging trucks passing through Clark County do not have a viable alternative to using Hwy. 67, which

runs parallel to I-30. Much of the truck traffic through the CBD is therefore comprised of logging trucks going to and returning from the processing mills. The presence of these trucks imposes travel time delays on other road users as turning trucks often have to wait for approaching vehicles to make their turns so that the necessary room is available for them to move through the intersection. Leading vehicles waiting in travel lanes for gaps in oncoming traffic result in delays for following vehicles. In addition, the high number of driveways in the project area contribute to turn complications. The frequent travel delays caused by these conditions reduce mobility in the area. As shown in Figure 2 and Figure 3, trucks must negotiate up to three difficult turns as they pass through the CBD, causing travel delays.

Mobility Near the I-30/Hwy. 51 Interchange

As previously described, the stop sign-controlled intersection of Hwy. 51 and Professional Park Dr. causes travel time delays. Vehicles turning left on both Hwy. 51 and Professional Park Dr. must yield to oncoming traffic, causing frequent stack ups and travel delays. These conditions also delay emergency vehicles going to and from Baptist Hospital.

For the reasons described above, providing an alternate route around the CBD and improving the I-30/Hwy. 51 interchange would increase mobility and connectivity.

1.4 How is the project related to other transportation plans and goals?

The ARDOT's Statewide Transportation Improvement Program (STIP) is a staged, multi-year, statewide intermodal program of transportation projects consistent with the statewide transportation plan and planning processes. The proposed project has been included in the 2019-2022 STIP and considered in the context of core STIP goals.

Arkadelphia's Comprehensive Development Plan identifies several transportation issues, two major ones being traffic at the existing I-30/Hwy. 51 interchange and traffic problems caused by large trucks traveling through the heart of downtown. As detailed in Section 1.3, the proposed project addresses these issues and meets the transportation goals and strategies outlined in the STIP and Arkadelphia's Comprehensive Development Plan.

The **Arkadelphia Comprehensive Development Plan** was prepared by the city's Planning Commission and serves an official policy statement for directing growth and development.

As previously described, planning studies have been completed. The 2013 Arkadelphia Bypass Study was prepared at the request of Arkadelphia city officials to evaluate options for improving traffic flow through Arkadelphia, particularly through the CBD. The study evaluated nine different alternatives, some of which were modified and incorporated into the alternatives as detailed in this Environmental Assessment (EA) and presented in Chapter 2.

1.5 What is the purpose of this project?

Given the needs, goals, and objectives described above, the purposes of this project are to improve safety, mobility, and connectivity in Arkadelphia by providing:

- An alternate route to reduce the number of logging and other large trucks traveling through the CBD;
- A safer east-west travel route for both local and through traffic; and
- I-30/Hwy. 51 interchange modifications to reduce traffic congestion and increase emergency vehicle access to and from the Baptist Hospital.

1.6 What is the purpose of this Environmental Assessment?

This EA was prepared in compliance with the *National Environmental Policy Act* (NEPA) to:

- Explain the purpose and need of the proposed action.
- Describe the alternatives considered for implementing the proposed action.
- Evaluate the social, economic, and environmental effects of the alternatives.
- Inform the public and decision makers about potential impacts of the proposed action so their feedback can be solicited.
- Determine whether effects are significant and require an Environmental Impact Statement (EIS) or if the project effects can be sufficiently documented through an EA and Finding of No Significant Impact (FONSI).

Although NEPA regulations do not provide specific thresholds to determine if project impacts are considered **significant**, they do outline the process that should be used to evaluate impacts.

Consideration is given both to context of the setting, and intensity, which is the severity of the impacts.

1.7 Who is leading this project?

This project is being led by a partnership between the Federal Highway Administration (FHWA) and the ARDOT. The FHWA is involved because it would fund a portion of the project and has the primary responsibility for the content and accuracy of this NEPA document. The project is also being funded through state funds allocated to the ARDOT. The ARDOT is responsible for administering and maintaining the state highway system.

A **Finding of No Significant Impact (FONSI)** presents the reasons why an action will not have significant environmental effects and therefore does not require preparing an Environmental Impact Statement (EIS). Based on analyses and project feedback received to date, the ARDOT anticipates preparing a FONSI for this project.

Chapter 2 – Alternatives

Chapter 2 identifies the project limits, explains how project alternatives were developed, describes the public involvement process, and describes the alternatives evaluated in this EA.

2.1 What are the project limits and why were they chosen?

The east-west project limits extend from Hwy. 51 east of the Ouachita River to Hwy. 51 west of I-30. The north-south project limits extend from just north of Hwy. 51 to the Arkadelphia Municipal Airport to the south. These limits allow for the consideration of alternatives that include the following: using the existing Ouachita River bridge; constructing a new Ouachita River bridge; multiple bypass location options south of town; and improving the I-30/Hwy. 51 interchange.

NEPA requires including a "**No Action**" alternative in environmental analysis. Although it is unlikely to meet the project's purpose and need, the "no action" alternative provides a baseline against which the other alternatives can be compared.

2.2 How were alternatives developed?

As outlined in Chapter 1, bypass alternatives were identified in previous planning studies. Seven Bypass Alternatives (Alternatives A-G; see **Figure 6**), four Interchange Alternatives (Alternatives 1-4; see **Figure 7**), and the No Action Alternative were subsequently evaluated for this project and presented to local officials and the public during a public involvement meeting held in February 2019. These alternatives are described below.

The alternatives have been categorized into routes west of Hwy. 67 (West Bypass Alternatives), routes east of Hwy. 67 (East Bypass Alternatives), and I-30/Hwy. 51 interchange improvement alternatives (Interchange Alternatives). Six of the seven alternatives provide for a Hwy. 51 bypass south of Arkadelphia (Alternatives A, B, C, E, F, and G) while one alternative (Alternative D) provides a direct north-south bypass for Hwy. 67 from Caddo St. south along 10th Street. With consideration to local official and public comments following the public meeting, an additional West Bypass Alternative (Alternative H) and an additional Interchange Alternative (Alternative 1A), were added for evaluation.

Alternatives Removed from Further Consideration

Following the public meeting, two bypass alternatives were removed from further consideration. Alternative C was removed because it is very similar to Alternative A but lies closer to residential homes, crosses 26th St. at a less desirable location, and was least preferred by the public. Alternative E was removed because it is similar to Alternative F but has more residential and business impacts and Alternative F was more preferred by the public.

Traffic operations of all Interchange Alternatives were very similar. However, Alternative 4 resulted in substantially more wetland impacts and impacts to a mobile home park (Cox Mobile Manor). This mobile home park is considered an environmental justice area due to the presence of minority and low-income populations. Therefore, Alternative 4 was removed from further consideration.

Figure 6: Initial Bypass Alternatives Considered

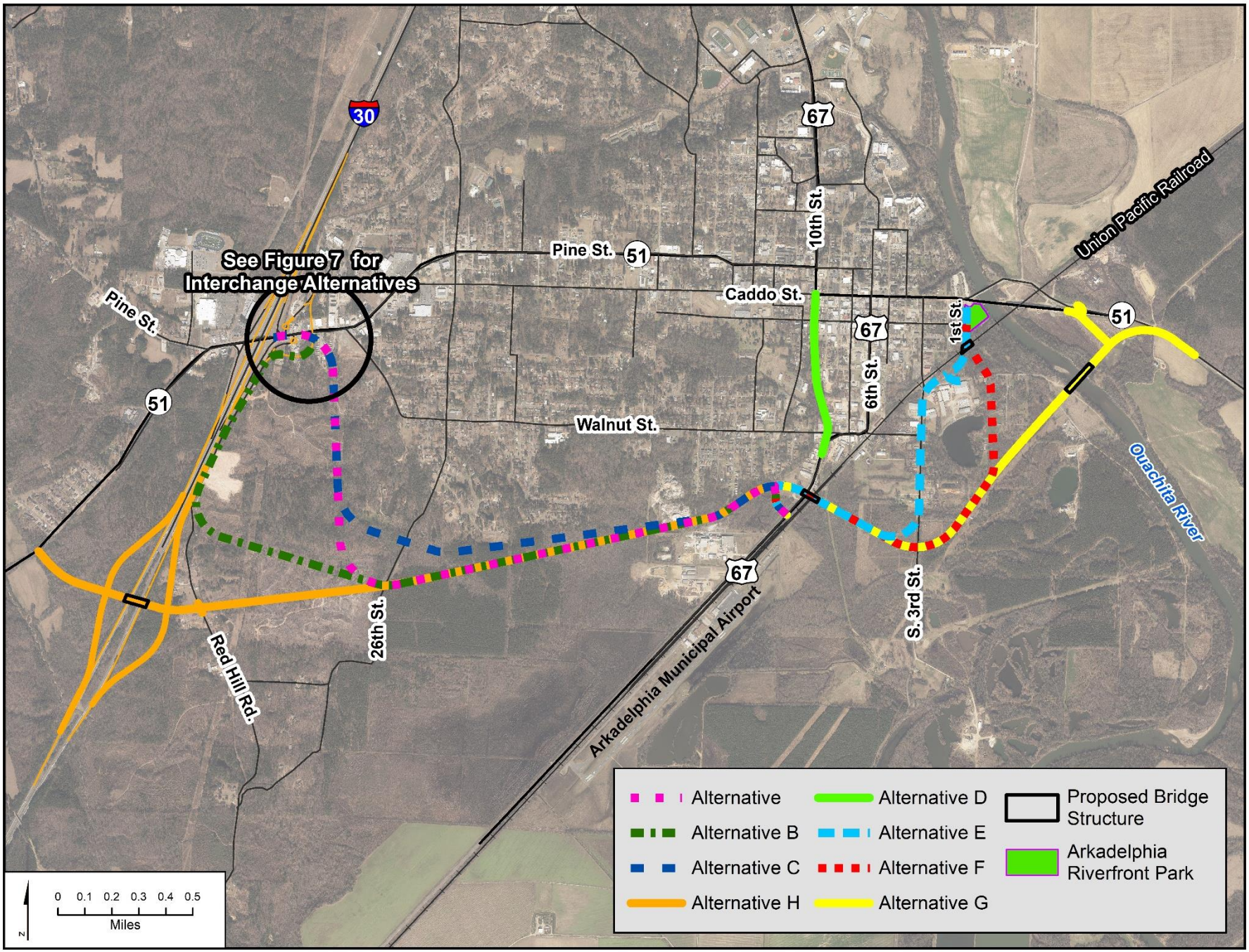
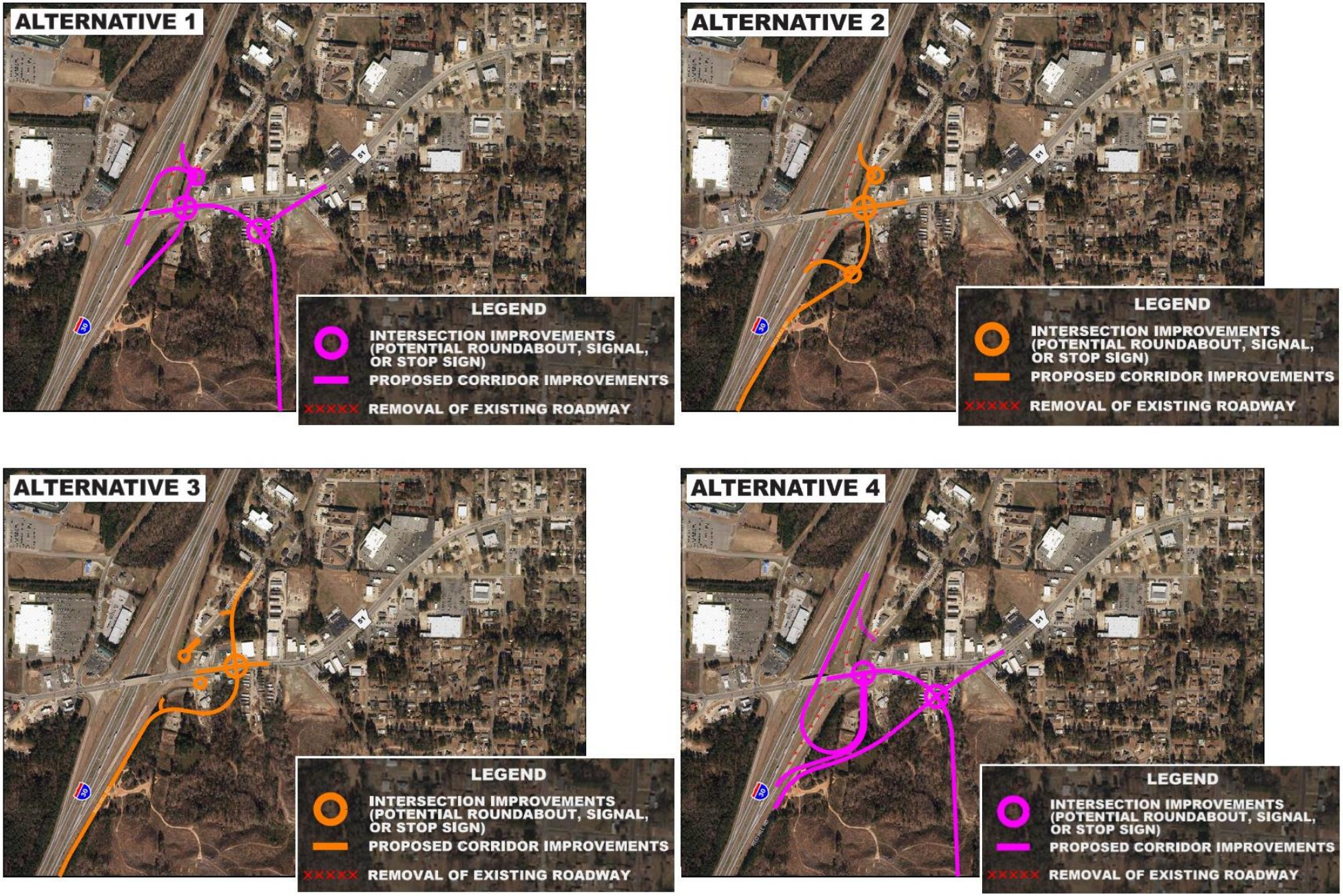


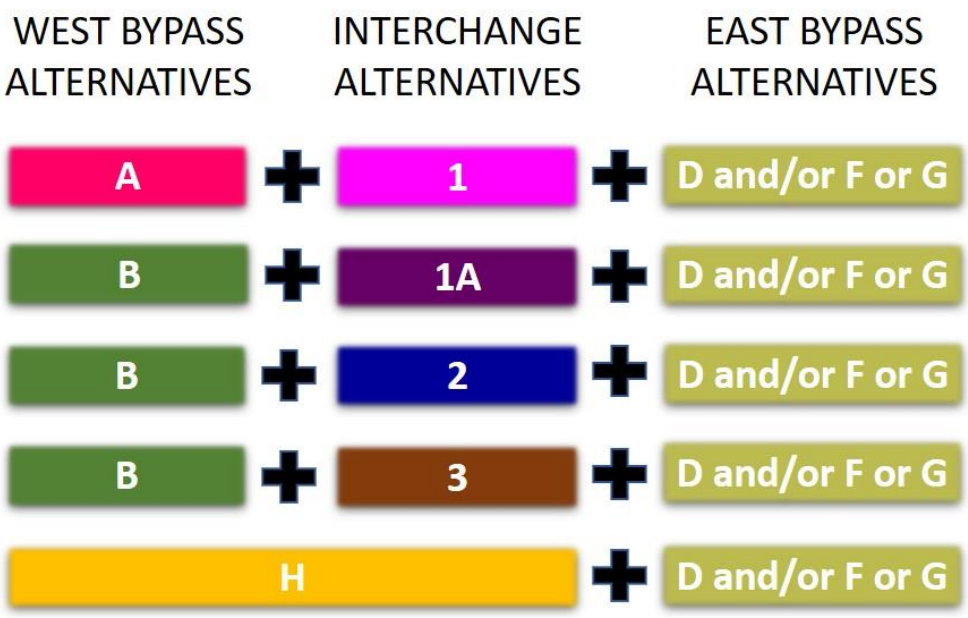
Figure 7: Initial Interchange Alternatives Considered



2.3 What alternatives are evaluated in this EA?

The No Action Alternative does not meet the purpose and need of the project because it would not reduce truck traffic through the CBD or improve safety. However, the No Action Alternative is considered in this EA as a baseline to compare impacts against the build alternatives.

West Bypass Alternatives A, B, and H; East Bypass Alternatives D, F, and G; and Interchange Alternatives 1, 1A, 2, and 3 are described below and will be discussed in the remainder of this EA. All bypass alternatives would be two-lane roadways. The city may choose to post Pine St. off limits to through trucks once the new bypass route is established. The Preferred Alternative likely will be a combination of a West Bypass Alternative and one or two East Bypass Alternatives (Alternative D could be selected in addition to Alternatives F or G) and may also include an Interchange Alternative if Alternative A or B is selected. Unlike the other bypass alternatives, Alternative H includes its own specific interchange improvements. The graphic below shows all possible alternative combinations. Not all West Bypass Alternatives can be paired with all Interchange Alternatives; however, any East Bypass Alternative can be paired with any West Bypass or Interchange Alternative.



West Bypass Alternatives

Alternative A is the shortest of the West Bypass Alternatives at approximately 2.5 miles. Alternative A, which is entirely on new location, connects to Hwy. 67 just north of the airport and ties into Hwy. 51 just east of I-30 (**Figure 8**). Alternative A proceeds north from Hwy. 67 for a short distance, turns west and continues west-southwest, crosses 26th St., then swings north to tie into Hwy. 51 via Interchange Alternative 1. The typical section of Alternative A would be a two-lane rural road with open shoulders

(**Figure 9**) and the average right of way (ROW) width would be 200 feet. Alternative A would be signed as Hwy. 51.

Alternative B is the second shortest of the West Bypass Alternatives at approximately 2.9 miles. Alternative B is identical to Alternative A east of 26th Street; however, after crossing 26th St., Alternative B continues west-northwest and incorporates and improves existing Red Hill Rd. for 0.6 mile before tying into Hwy. 51 via Interchange Alternative 1A, 2, or 3 (Figure 8). The typical section of Alternative B would be a two-lane rural road with open shoulders (Figure 9) and the average ROW width would be 200 feet. Alternative B would be signed as Hwy. 51.

Alternative H is the longest of the West Bypass Alternatives at approximately 3.0 miles and is entirely on new location. Alternative H is identical to Alternatives A and B east of 26th St.; however, after crossing 26th St., Alternative H continues west-southwest, crosses Red Hill Rd., would construct a new overpass and diamond interchange at I-30, and then ties into Hwy. 51 on the west side of I-30 (Figure 8). Unlike the other bypass alternatives, which would incorporate one of the four Interchange Alternatives, Alternative H includes its own specific improvements to the I-30/Hwy. 51 interchange and to the surrounding area to the east. These improvements consist of the construction of collector-distributor (C-D) lanes (one single-lane road on each side of I-30) between the proposed I-30/Hwy. 51 interchange and the existing I-30/Hwy. 51 interchange as well as street improvements immediately east of the existing I-30/Hwy. 51 interchange. Due to the close spacing between the proposed and existing I-30/Hwy. 51 interchanges, weaving on the main lanes of I-30 may occur and these C-D lanes are incorporated to eliminate this potential weaving. These C-D lanes would be utilized in order to access both the existing and proposed I-30/Hwy. 51 interchanges. The proposed street improvements immediately east of the existing I-30/Hwy. 51 interchange would provide adequate separation between the I-30 on/off ramps and the local street intersections. This separation would be achieved by removing the existing Hwy. 51/Professional Park Dr. intersection and the existing Hwy. 51/Red Hill Rd. intersection and moving them 500 feet and 375 feet, respectively, to the east. The typical section of the bypass portion of Alternative H, which would be signed as Hwy. 51 and would be a two-lane rural road with open shoulders, is shown in Figure 9. The average ROW width of Alternative H ranges from 200 feet to 300 feet with the larger width needed for possible requirements of the interchange and ramps. The typical section of the ramps and C-D lanes associated with Alternative H is shown in **Figure 10**. A detailed view of the Alternative H proposed improvements near the I-30/Hwy. 51 interchange is provided in **Figure 11**.

C-D lanes are lanes specifically designed to handle entering and exiting traffic along an interstate or highway. These lanes are barrier separated from the main interstate and enhance safety by allowing more distance for vehicles to merge and move over to access on ramps. C-D lanes also enhance safety by providing a place for exiting traffic to wait to access cross streets, rather than backing up onto high-speed main lanes.

Figure 8: West Bypass Alternatives A, B, and H

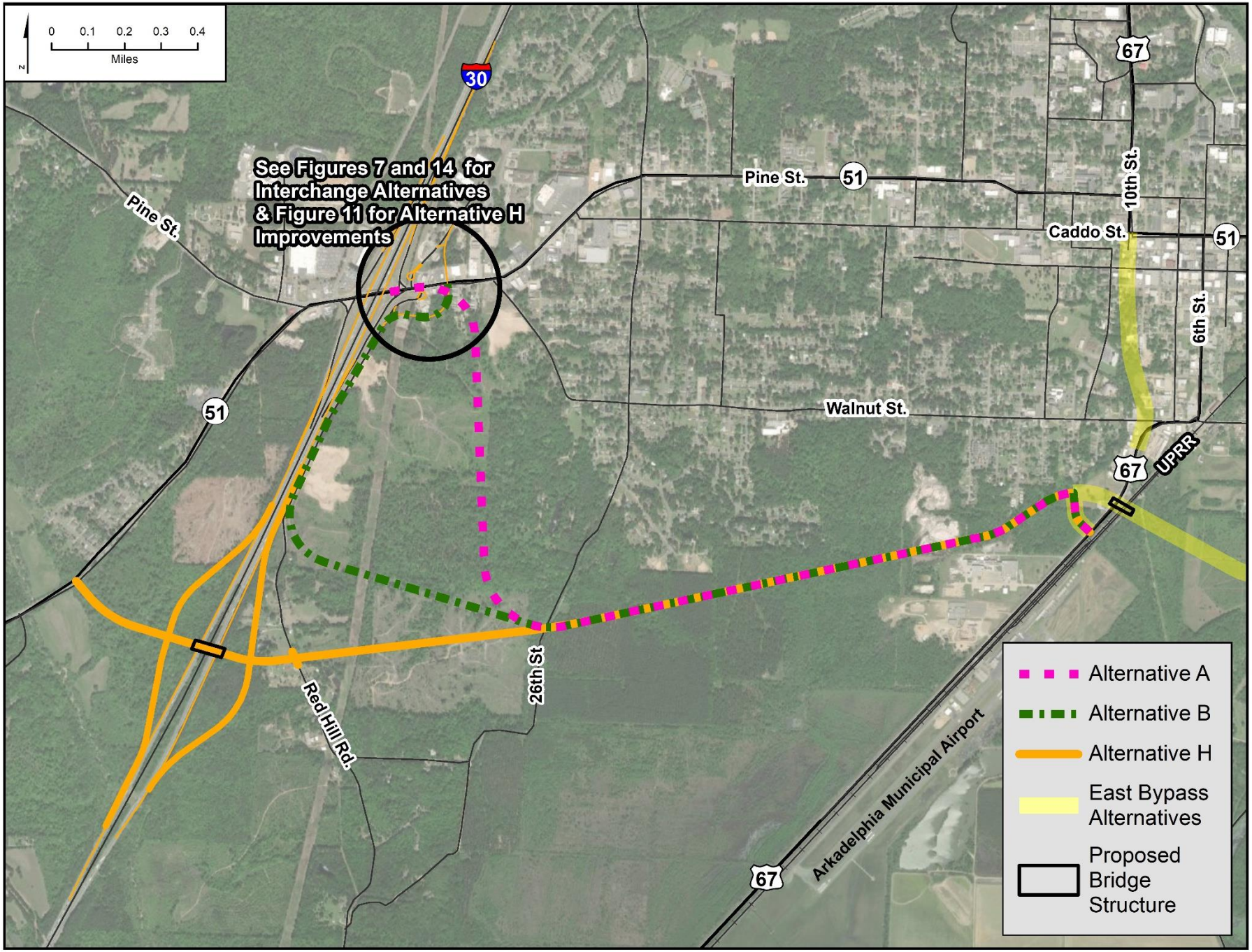


Figure 9: Typical Section of Alternatives A, B, G, and H

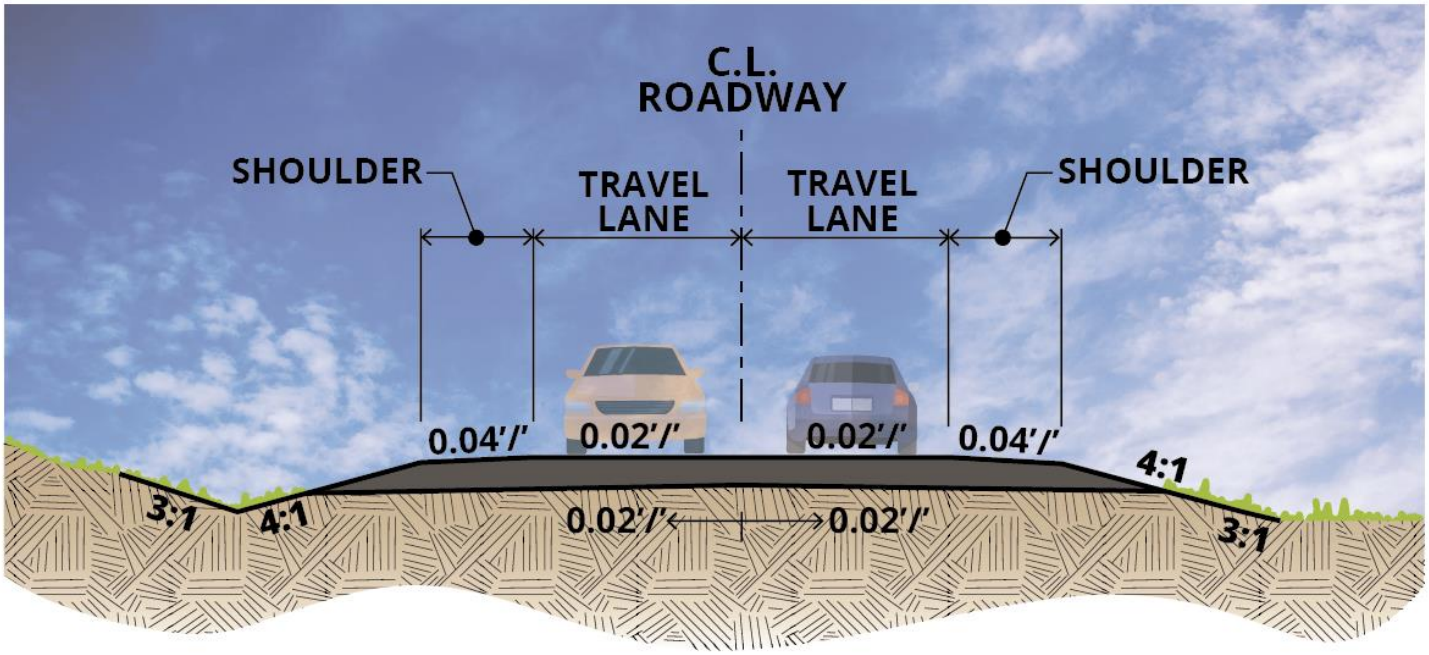


Figure 10: Typical Section of Alternative H Ramps and Interchange Alternatives 1, 1A, 2, and 3

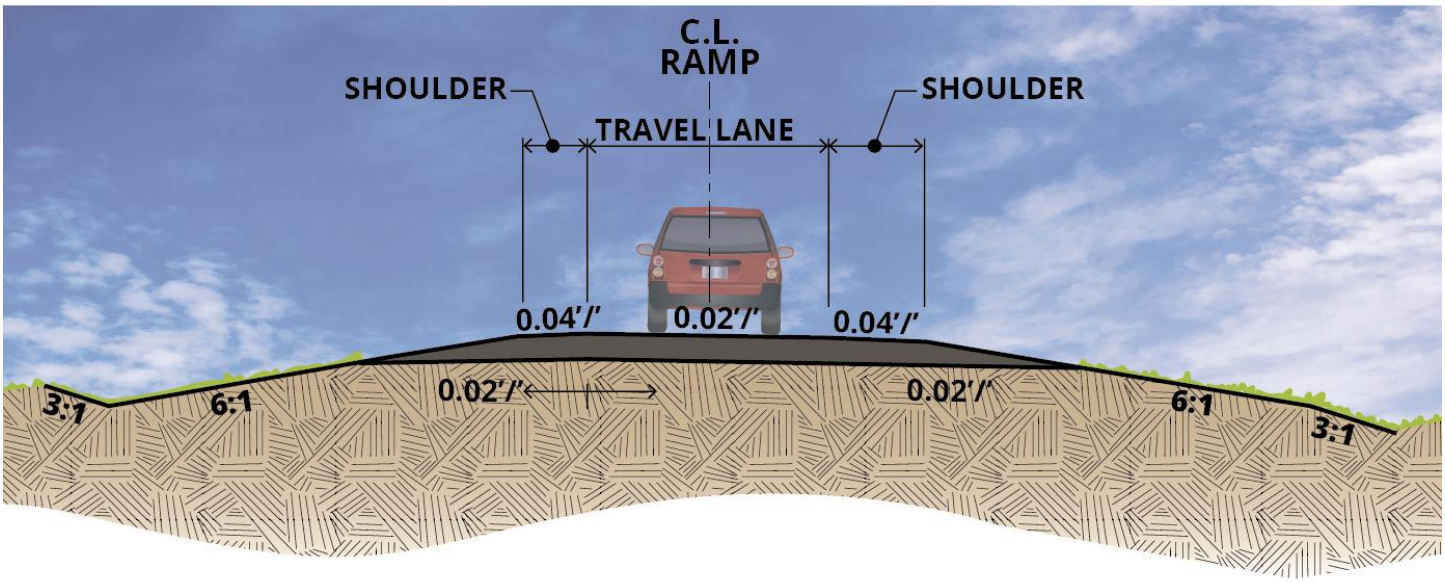
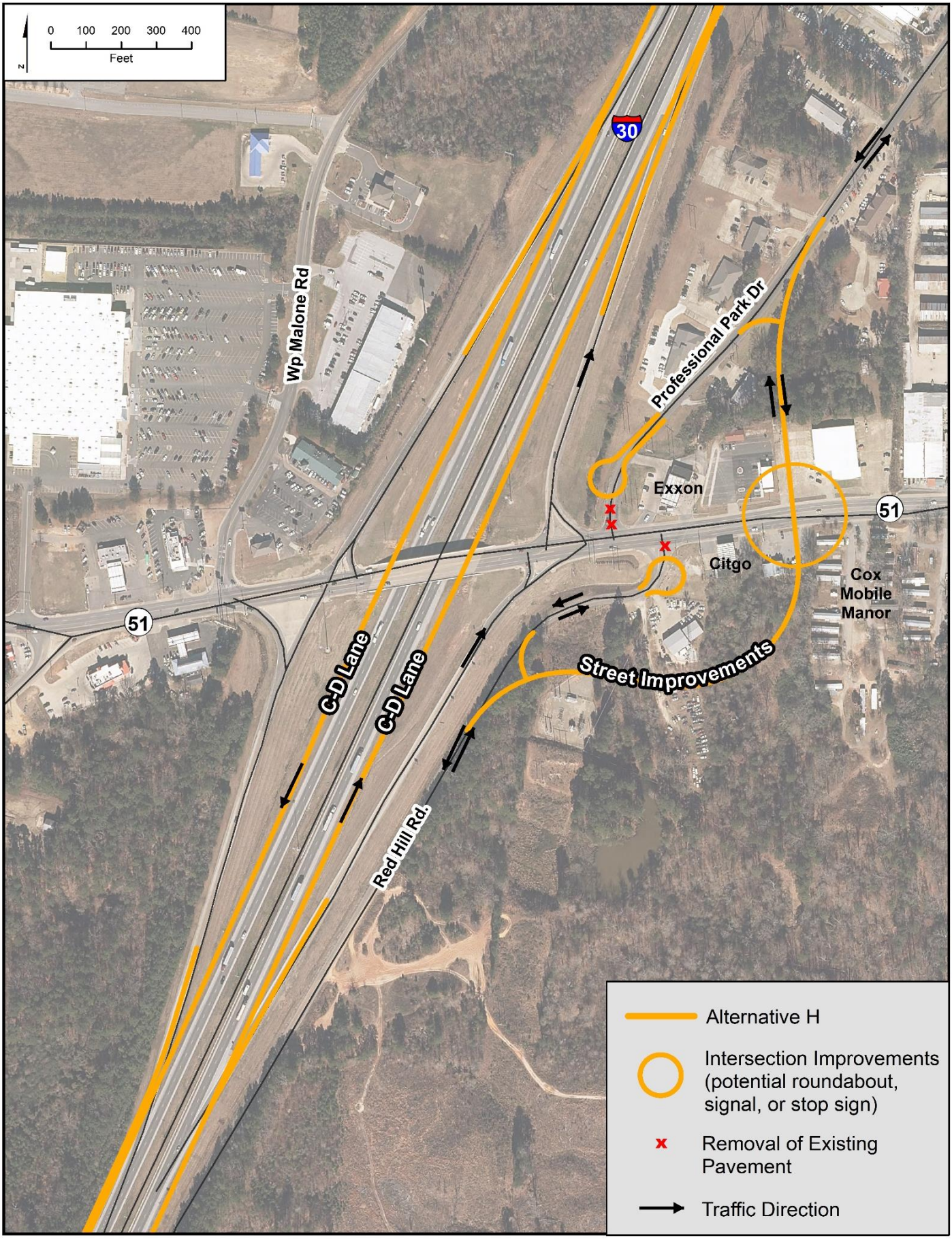


Figure 11: Alternative H Improvements Near the I-30/Hwy. 51 Interchange



East Bypass Alternatives

Alternative D, which is shown in **Figure 12**, is the shortest East Bypass Alternative at approximately 0.6 mile. Alternative D would improve the existing roadway geometry at the intersection of Caddo St. and 10th St., improve 10th St. from Caddo St. to Clinton St., and then extend 10th St. (which currently dead ends at Clinton St.) south on new location until it ties into Hwy. 67 just south of Walnut Street. Because Alternative D is the only alternative that removes the north-south traffic from the CBD on Hwy. 67, but does not help alleviate east-west traffic on Hwy. 51, Alternative D could be combined with Alternatives F or G to meet project goals. With the exception of the short segment along 10th St., Alternative D is entirely on new location. The typical section of Alternative D would consist of two travel lanes with curb and gutter (**Figure 13**) and the average ROW width would be 100 feet. Alternative D would be signed as Hwy. 67.

Alternative F is the second longest of the East Bypass Alternatives at approximately 1.8 miles. Alternative F proceeds north from Hwy. 67 for a short distance, then turns east and crosses both Hwy. 67 and the UPRR with a new overpass (Figure 12). Alternative F then continues east-southeast, crosses 3rd St., and then swings northward and crosses Hemphill Road. North of Hemphill Rd., Alternative F would involve constructing a second new UPRR overpass near 1st St., where it would then merge with 1st St. until tying into Hwy. 51 at a stop sign or signal controlled intersection just west of the existing Ouachita River bridge abutment. With the exception of the short segment along 1st St., Alternative F is entirely on new location. Retaining walls are proposed to avoid direct impacts to the apartment complex located on the west side of 1st St. and to minimize impacts to the Riverfront Park located on the east side of 1st Street. The typical section of Alternative F would consist of two travel lanes with curb and gutter (Figure 13) and the average ROW width would be 100 feet north of the northern-most UPRR crossing and 200 feet south of this crossing. Alternative F would be signed as Hwy. 67.

Alternative G is the longest East Bypass Alternative at approximately 2.4 miles and would require constructing a new bridge over the Ouachita River. Alternative G is identical to Alternative F west of 3rd St.; however, where Alternative F swings to the north near Nowlin Pond, Alternative G continues to the northeast (Figure 12). Alternative G then crosses Hemphill Rd. before crossing over the Ouachita River on a new bridge. After crossing the river, Alternative G ties into Hwy. 51 East as the direct movement and uses a left turn to access Hwy. 51 West. Alternative G is entirely on new location. The typical section of Alternative G would consist of two travel lanes with open shoulders (Figure 9) and the average ROW width would be 200 feet. Alternative G would be signed as Hwy. 67.

Figure 12: East Bypass Alternatives D, F, and G

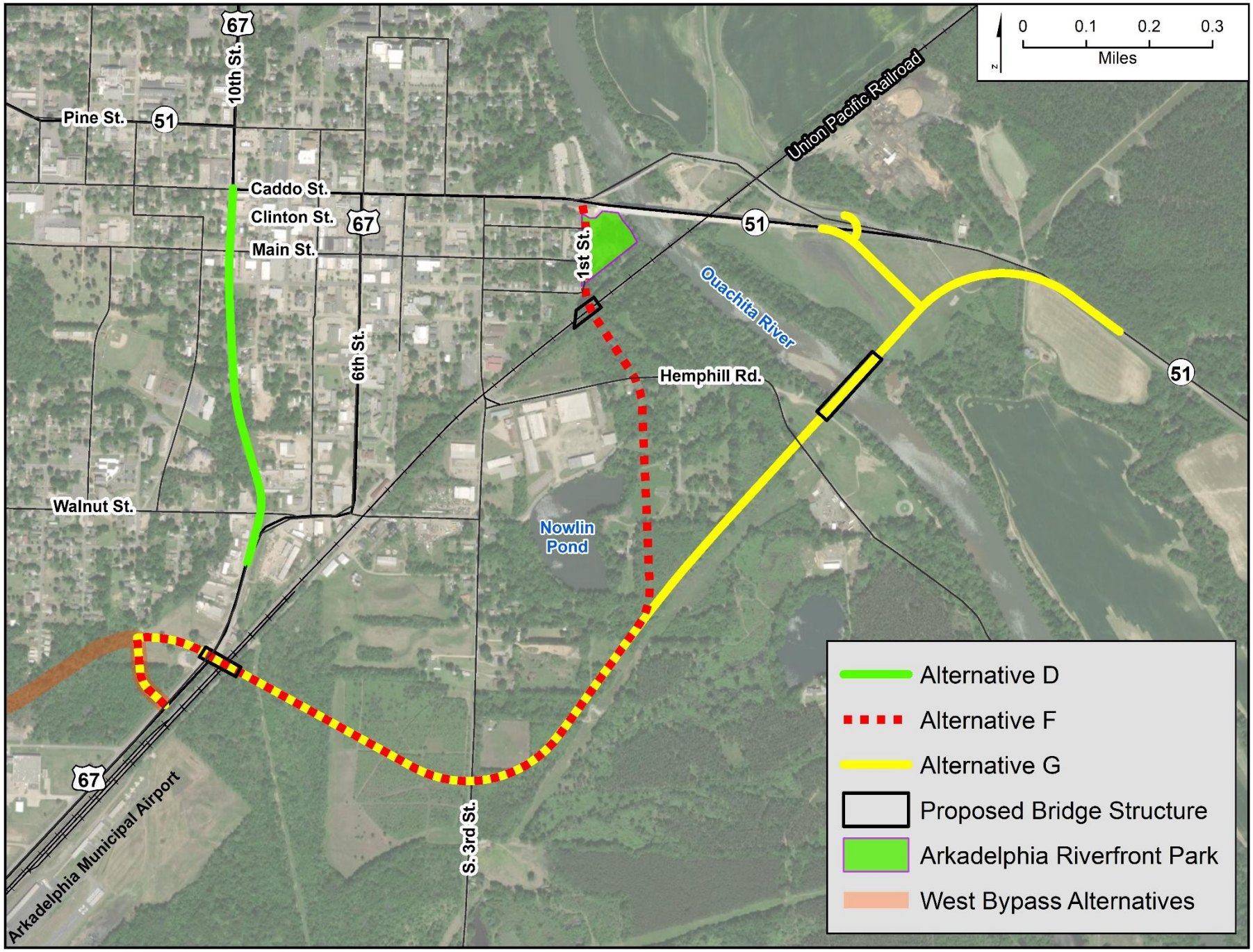
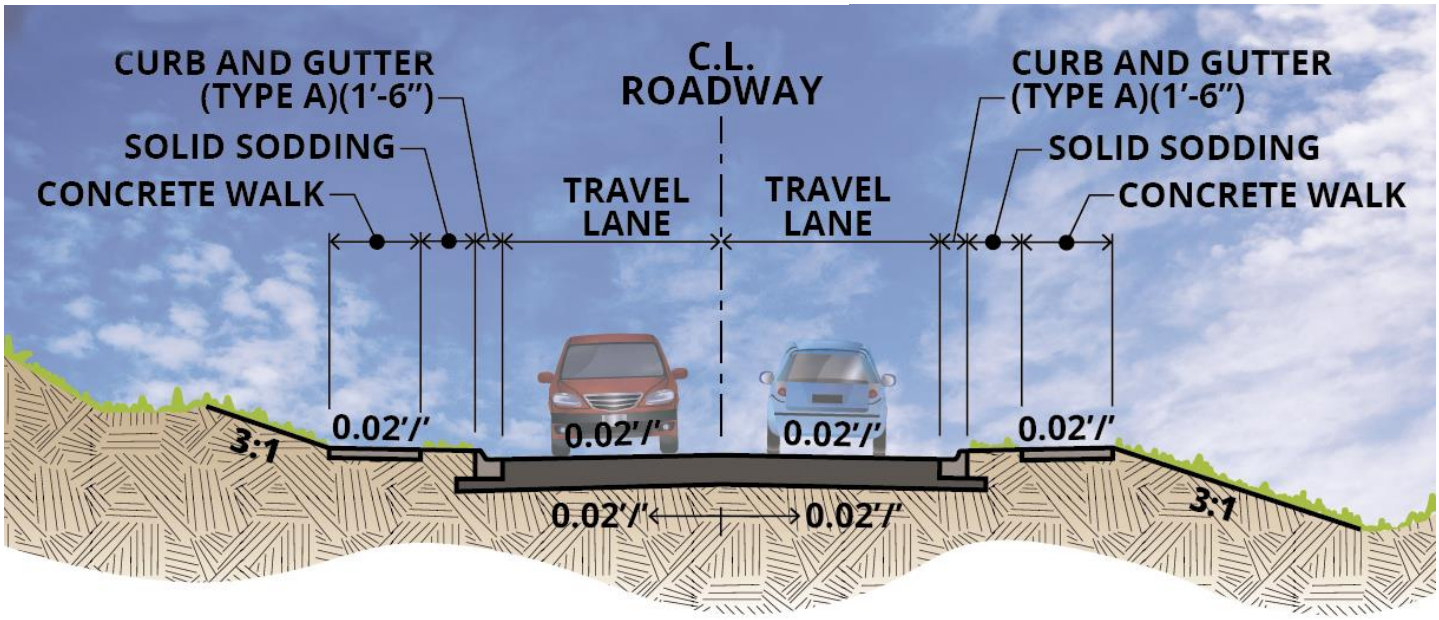


Figure 13: Typical Section of Alternatives D and F



Interchange Alternatives

For each of the Interchange Alternatives, proposed intersection improvements (as indicated by circles on Figure 7) could be a roundabout, signal, or stop sign. The average ROW width of roadway improvements for each Interchange Alternative is 50 feet and the typical section of each is shown in Figure 10.

Alternative 1 would require modifications to the existing diamond interchange to allow for better intersection spacing. Two new buttonhook ramps would be constructed that tie into Professional Park Dr. The new exit ramp would allow for a left or right turn onto Professional Park Dr. The right turn movement would also serve as access to Hwy. 51 westbound. The existing eastbound I-30 exit would be retained and modified to eliminate left turning movements and only allow access to eastbound Hwy. 51. The new eastbound I-30 on ramp connection would tie into Professional Park Dr. and connect to the existing I-30 eastbound on ramp, requiring removal of approximately 700 feet of the existing ramp. To the east of the Red Hill Rd. realignment, the new primary through movement would be the new bypass alignment instead of Hwy. 51. The existing Hwy. 51 alignment to the east of the interchange would be modified to tie into the new bypass alignment with a signalized intersection or roundabout.

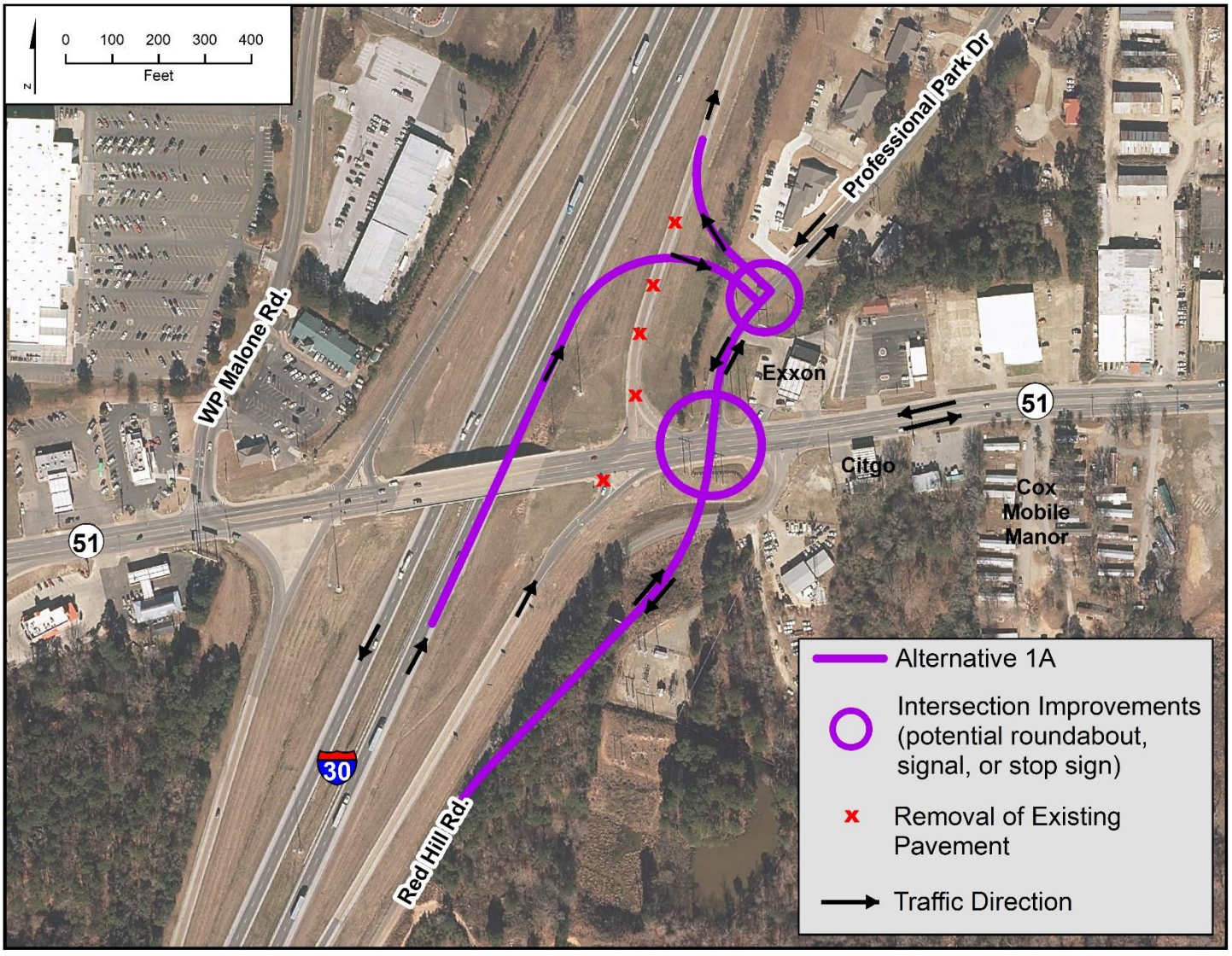
Alternative 1A (**Figure 14**) would require the same modifications as Alternative 1 with the exception that it would not include the eastern-most intersection improvement that ties into Hwy. 51.

Alternative 2 would require modifications to the existing diamond interchange. A new buttonhook ramp would be constructed that ties into Professional Park Dr. north of Hwy. 51, and a new buttonhook ramp would also be constructed that ties into the new bypass alignment to the south, which also serves as access to Red Hill Road. The new exit ramp, which ties into the existing exit ramp, would allow for a left or right turn onto the new bypass alignment. Approximately 700 feet of the existing ramp would be

removed to the north of the new ramp connection. The left turn movement from the ramp serves as access to Hwy. 51. The new eastbound I-30 on ramp connection would tie into Professional Park Dr. and connect to the existing I-30 eastbound on ramp. The existing Hwy. 51 alignment would largely remain the same as existing conditions.

Alternative 3 would not require modifications to the existing diamond interchange. With this alternative, the ramps would remain in their existing location, and the intersection of Professional Park Dr. and Red Hill Rd. would be relocated to the east. The existing Hwy. 51 alignment would largely remain the same as existing conditions.

Figure 14: Interchange Alternative 1A



2.4 How well would each alternative improve mobility and how much would each cost?

Detailed traffic information is provided in Appendix A and the estimated total construction and ROW costs for each alternative are provided in **Table 2**. Total costs of bypass alternatives range from $5.8 million to $49.6 million, and total costs of Interchange Alternatives range from $6.6 million to $10.9 million.

Table 2: Cost Estimate in 2019 Dollars

Alternative and Location		Alternative Length	Construction Cost	ROW Cost	Total Cost
N/A	No Action	0 miles	$0	$0	$0
West Bypass	Alternative A	2.5 miles	$10,600,000	$93,050	$10,693,050
	Alternative B	2.9 miles	$12,500,000	$117,120	$12,617,120
	Alternative H	3.0 miles	$46,400,000	$3,178,200	$49,578,200
East Bypass	Alternative D	0.6 miles	$3,800,000	$1,965,120	$5,765,120
	Alternative F	1.8 miles	$10,400,000	$377,750	$10,777,750
	Alternative G	2.4 miles	$18,000,000	$191,700	$18,191,700
Interchange Alternatives	Interchange 1	-	$8,200,000	$2,678,700	$10,878,700
	Interchange 1A	-	$5,900,000	$668,000	$6,568,000
	Interchange 2	-	$9,600,000	$746,250	$10,346,250
	Interchange 3	-	$4,800,000	$2,656,000	$7,456,000

No Action Alternative

The No Action Alternative would not provide a bypass, create new infrastructure, change traffic patterns, or make improvements to traffic flow and safety. Thus, under the No Action Alternative, crash rates, traffic volumes, congestion, and travel delays would continue. The primary concern of logging and other large trucks passing through the CBD would not be addressed.

West Bypass Alternatives

Alternatives A and B would route traffic through the existing I-30/Hwy. 51 interchange, while Alternative H would remove through traffic from the interchange by providing a new interchange to the south. All West Bypass Alternatives would relocate Hwy. 51 to a parallel route south of the city and provide an additional connection between I-30 and the CBD. I-30 traffic traveling to and from Hwy. 67 south of Arkadelphia would also utilize this route.

All West Bypass Alternatives would provide another route besides existing Hwy. 51 and Walnut St. for local traffic traveling between I-30 and the CBD. This would be especially beneficial for mobility and safety on Hwy. 51.

East Bypass Alternatives

Alternative D would prevent most north and southbound traffic on Hwy. 67 from entering the CBD by extending 10th St. south and avoiding any difficult turns in the CBD. Alternative D would not significantly reduce traffic in the CBD traveling east or west on Hwy. 51. However, Alternative D would improve the geometry for the turning radius at the intersection of Caddo St. and 10th St. (i.e., the northern terminus of Alternative D). While this improved intersection would still require 90 degree turns for traffic heading east or west, the intersection design would have an adequate turning radius and allow safer and less problematic turns for traffic (especially large trucks). Alternative D is the most effective at reducing truck traffic traveling north and south on Hwy. 67 through the CBD.

Alternative F has the potential to prevent through westbound traffic on Hwy. 51 coming from east of Arkadelphia from entering the CBD. North and southbound traffic on Hwy. 67 and eastbound traffic on Hwy. 51 would pass through the north end of the CBD on Hwy. 51 to reach the bypass and then proceed south around the CBD. A stop sign or signal controlled intersection at Hwy. 51 and 1st St. (i.e., at the north terminus of Alternative F) would be required, and Clinton St. and Main St. would dead-end at the bypass. These elements may decrease mobility for local traffic.

Alternative G would function to improve mobility in the same manner as Alternative F with the exception that Alternative G would provide an easier connection to Hwy. 51 on the east side of the Ouachita River and avoid the stop-sign controlled intersection required by Alternative F at the existing Ouachita River bridge abutment.

Interchange Alternatives

The short spacing between the I-30 ramps and the intersections of Professional Dr. and Red Hill Rd. at Hwy. 51 causes safety and mobility concerns at the existing interchange. Alternative H and all four Interchange Alternatives would improve safety and mobility on Hwy. 51 just east of I-30; however, this would be accomplished using different options. Interchange Alternatives 1, 1A, and 2 would modify the configuration of the existing off and on ramps to prevent a direct tie into Hwy. 51. Alternative 3 and Alternative H would incorporate the existing interchange and relocate the existing Professional Park Dr. and Red Hill Rd. intersections to a single intersection. This intersection improvement reduces the number of conflict points along the corridor where crashes could occur and would provide near equal signal spacing which is ideal in optimizing traffic flow. Signalizing this intersection would also reduce side street delay.

2.5 How has the public been involved?

A public officials meeting and an open forum public involvement meeting were held on February 5, 2019, at Henderson State University. Including ARDOT and other staff, 19 people attended the public

officials meeting, and 145 people attended the public involvement meeting. Alternatives A-G and Interchange Alternatives 1-4 were presented. Fifty-two comment forms and five letters were received. A majority of those who commented expressed a need for a bypass (46 yes; 5 no) and did not prefer improvements to Hwys. 51 and 67 instead. The complete public involvement meeting synopsis is included in **Appendix B**. As referenced in Section 2.2, local official and public input subsequently resulted in the development of an additional West Bypass Alternatives (Alternative H) to connect the bypass directly to I-30 and an Interchange Alternative (Alternative 1A) was added.

A location public hearing will be held upon completion of the EA process and FHWA will determine if this project warrants an EIS due to significant impacts or if a FONSI will be issued.

2.6 How have government agencies been involved?

As described above, input from public officials was solicited regarding the proposed project. Additionally, federal and state resource agencies were asked to review the proposed project and identify potential impact concerns. Responses from these agencies are provided in **Appendix C**.

2.7 How have tribal governments been involved?

Section 106 of the *National Historic Preservation Act* requires federal agencies to consult with tribes where projects could affect tribal areas with historical or cultural significance. The FHWA initiated coordination with tribes having an active cultural interest in the area. The tribes contacted included the Caddo Nation, Chickasaw Nation, Choctaw Nation of Oklahoma, Jena Band of the Choctaw Indians, Osage Nation, Quapaw Tribe of Oklahoma, Shawnee Tribe of Oklahoma, and the Tunica-Biloxi Tribe of Louisiana, Inc. The Tribal Historic Preservation Officers were given the opportunity to comment on the proposed project. No objections to the proposed project were received. The final Cultural Resources report will be sent to any tribe requesting a copy of the report. Copies of the tribal correspondence are located in Appendix C.

1

Chapter 3 – Environmental Impacts and Mitigation

This chapter summarizes potential project impacts on people and the environment.

3.1 How were potential impacts evaluated?

Environmental scientists conducted analyses to determine how the project would potentially impact the area's natural and built environments. Potential impacts are described in the text and, as applicable, additional information is incorporated by reference or included in the appendices.

Potential impacts are changes or effects that could occur as a result of a proposed action. The impacts may be social or cultural, economic, or ecological. The terms "impact" and "effect" can be used interchangeably.

The analyses considered both the intensity of the effects and their duration (e.g., short-term during construction or remaining permanently after construction). The effects discussed in this chapter are presumed to be long-term unless otherwise noted. Effects are generally described in terms such as beneficial or positive, and adverse or negative. Mitigation measures are sometimes available to minimize or neutralize negative effects and can enhance positive effects.

All the analyses in this section are based on preliminary design. As design progresses from preliminary to final design, every effort will continue to be made to avoid or minimize negative impacts. Off-site areas that might be required during construction (e.g., borrow pits, material and equipment storage areas, etc.) will be evaluated when they are identified during the construction phase of the project.

3.2 Would the project require any relocations or right of way acquisitions?

Table 3 outlines the quantities of ROW acquisitions and the number of relocations necessary for each alternative, and the types and numbers of properties that would be displaced are described below. Relocation assistance will be provided in accordance with the *Uniform Relocation Assistance Act* and will mitigate any adverse effects. A conceptual stage relocation study is provided in **Appendix D**.

Relocations occur when a residence, business, or nonprofit organization is impacted severely enough that they cannot continue to live or do business at their current location. This usually occurs when proposed ROW acquisition requires removing a structure, taking most of a business's parking, or severing access to a property.

The United States Geological Survey 2016 National Landcover Dataset (NLCD) was used to identify land use/land cover types along the alternative alignments. As quantified in **Table 4** and shown in **Figure 15**, the construction of the proposed project would result in the direct conversion of land from its present use to a transportation use.

The preliminary ROW totals presented in Table 3 differ from those presented in Table 4. The Table 3 totals are based only on those areas where complete parcel data is known, and parcel data is not currently available for all areas. The exact quantities of required ROW and ROW conversions will be determined once the Preferred Alternative is identified.

Table 3: Preliminary ROW and Relocations Required for Each Alternative

Alternative and Location		Acres of Required ROW Acquisition			Number of Relocations		
		Residential	Other*	TOTAL**	Residential	Other*	TOTAL
N/A	No Action	0	0	**0**	0	0	**0**
West Bypass	Alternative A	3.5	52.5	**56.0**	0	0	**0**
	Alternative B	3.5	60.2	**63.7**	0	0	**0**
	Alternative H	12.0	129.5	**141.5**	6†	6	**12†**
East Bypass	Alternative D	1.1	4.2	**5.3**	4	10	**14**
	Alternative F	3.6	25.5	**29.1**	3	2	**5**
	Alternative G	1.1	36.8	**38.0**	1	2	**3**
Interchange Alternatives	Interchange 1	3.5	2.6	**6.1**	18†	4	**22†**
	Interchange 1A	0	1.3	**1.3**	0	1	**1**
	Interchange 2	0	3.4	**3.4**	0	1	**1**
	Interchange 3	0	5.3	**5.3**	3†	5	**8†**

*"Other" includes churches, government facilities, and business properties.

**Due to rounding, the sum of the residential and other acreage quantities may not equal the actual total.

† Includes mobile homes located at Cox Mobile Manor.

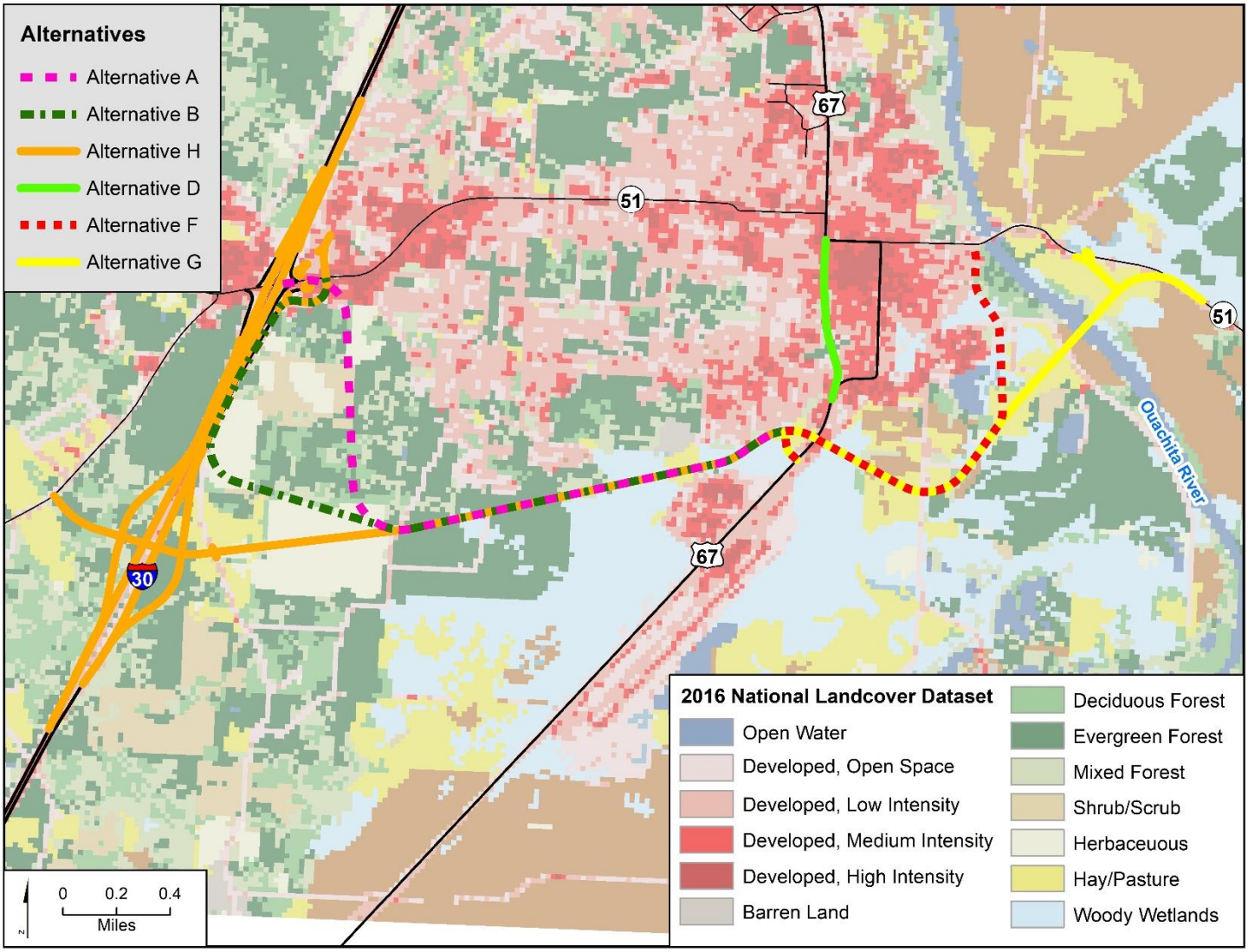
Table 4: Land Cover Types to be Converted to Highway ROW

Alternative and Location		Approx. Acres of Dominant Land Cover Types to be Converted to Hwy. ROW					
		Crops	Hay or Pasture	Herbaceous	Woodland or Scrub-Shrub	Developed	TOTAL*
N/A	No Action	0	0	0	0	0	**0**
West Bypass	Alternative A	0	3.8	4.7	49.7	1.9	**60.0**
	Alternative B	0	3.8	14.5	40.6	2.7	**61.6**
	Alternative H	0	12.8	19.9	93.1	38.8	**165.4**
East Bypass	Alternative D	0	0	0	1.3	4.0	**5.3**
	Alternative F	2.1	10.2	1.8	16.9	5.6	**36.6**
	Alternative G	3.7	24.6	1.0	9.9	4.4	**43.8**

Alternative and Location		Approx. Acres of Dominant Land Cover Types to be Converted to Hwy. ROW					
		Crops	Hay or Pasture	Herbaceous	Woodland or Scrub-Shrub	Developed	TOTAL*
Interchange Alternatives	Interchange 1	0	0	0	0.9	13.7	**14.6**
	Interchange 1A	0	0	0	0.3	8.0	**8.4**
	Interchange 2	0	0	0.1	1.0	2.9	**4.0**
	Interchange 3	0	0	0	<0.1	6.4	**6.4**

*As only the dominant land cover types were listed and values were rounded, the sum of the land cover types may not equal the actual total of ROW that would be acquired.

Figure 15: Land Cover Types Converted by Each Alternative



No Action Alternative

Since new ROW would not be needed, existing residences, businesses, or other properties would not be relocated, and no new ROW would be acquired or converted to other uses.

West Bypass Alternatives

For Alternatives A, B and H, a total of approximately 56, 64, and 142 acres, respectively, of new ROW would need to be acquired. No residential or business relocations would be required by Alternatives A or B. For Alternative H at Red Hill Rd., three homes and the Grace Fellowship Church would require relocation. At the existing I-30/Hwy. 51 interchange, local street improvements under Alternative H would require three residential relocations within Cox Mobile Manor and additionally five business relocations.

Alternatives A and H are entirely on new location and would primarily convert woodlands to highway ROW. Alternative H would also convert previously developed land, herbaceous areas, and some hay/pastureland to ROW. The new location portion of Alternative B would primarily convert woodlands and herbaceous areas to highway ROW. However, Alternative B incorporates an existing roadway section, reducing the total amount of new ROW required.

East Bypass Alternatives

Alternative D would require approximately 5.3 acres of new ROW. This includes four residential relocations, eight business relocations, Grace Bible Church, and one county government office.

For Alternative F, a total of approximately 29.1 acres of new ROW would need to be acquired. This includes three residential relocations and two business relocations. Retaining walls are proposed near the Forest Hills Apartment complex on the west side of 1st St. to avoid relocation impacts for this structure.

For Alternative G, a total of approximately 38.0 acres of new ROW would need to be acquired. This includes one residential relocation and two business relocations.

For Alternative D, most of the land being converted to highway ROW has been previously developed. Alternatives F and G would primarily convert woodlands and hay/pastureland to highway ROW, with Alternative F converting more woodlands and Alternative G converting more hay/pastureland.

Interchange Alternatives

For Interchange Alternative 1, a total of approximately 6.1 acres of new ROW would need to be acquired. This includes four business relocations and 18 residential relocations within Cox Mobile Manor.

Alternative 1A would require a total of approximately 1.3 acres of new ROW to be acquired. This includes the relocation of one business property with no residential relocations.

Alternative 2 would require a total of approximately 3.4 acres of new ROW to be acquired. This includes the relocation of one business property with no residential relocations.

Alternative 3 would require a total of approximately 5.3 acres of new ROW. This includes the same five business relocations and same three residential relocations (within Cox Mobile Manor) as required by Alternative H.

Interchange Alternatives 1 and 2 would primarily convert already-developed land to highway ROW, but these alternatives also convert approximately 1 acre of woodland to highway ROW. Alternative 1A and Alternative 3 primarily only convert already-developed land to highway ROW.

3.3 How would the project affect the community?

An Environmental Justice (EJ) analysis was performed in accordance with Executive Order 12898. The EJ analysis was intended to identify and address any disproportionately high and adverse effects to low-income or minority populations within the project study area. A low-income household was defined as one whose income is at or below the 2019 Department of Health and Human Services poverty guidelines for a family of four ($25,750). High minority areas are areas with a minority population greater than 50% of the total population.

Environmental Justice at the FHWA means identifying and addressing disproportionately high and adverse effects of the agency's programs, policies, and activities on minority populations and low-income populations to achieve an equitable distribution of benefits and burdens.

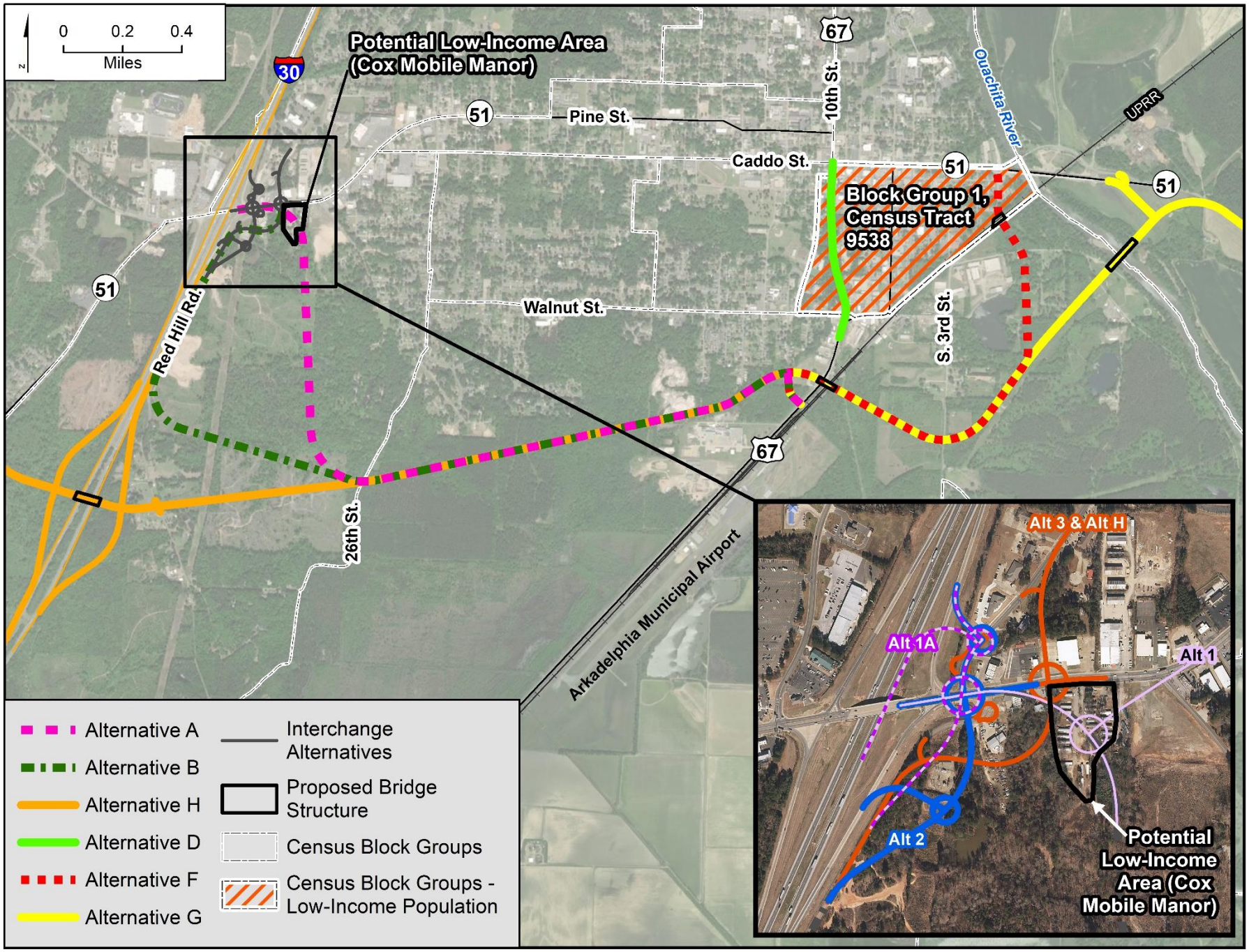
Clark County and Arkadelphia respectively have estimated populations of 22,385 and 10,611 persons (U.S. Census Bureau, 2018). Most residents live south of Hwy. 51 and west of Hwy. 67.

A **minority population** is a readily identifiable group of minority (Black, Hispanic or Latino, Asian American, American Indian or Alaska Native, or Native Hawaiian or Other Pacific Islander) persons living close to a FHWA project who would be similarly affected by the project.

U.S. Census Block and Block Group data were obtained to determine the presence of minority and low-income populations within the study area (U.S. Census Bureau, 2010 and 2017). Data from 115 Blocks and six Block Groups within two Census Tracts were used to better characterize populations that may be affected by the proposed project. **Figure 16** shows the location of two areas in the project limits for consideration under EJ guidelines.

While all the build alternatives involve construction on new locations to some degree, no subdivisions or neighborhoods would be split as a result of the proposed project. Additionally, no adverse effects on community cohesion nor disruption of community services would occur from the project. Furthermore, implementation of a bypass would cause a reduction in traffic through the CBD and along Hwy. 51, which would encourage pedestrian traffic in the CBD and foster community cohesion.

Figure 16: Potential Low-Income Areas



Eighteen of the 23 relocations associated with Interchange Alternative 1 occur in a single, low-income mobile home park. This alternative would cause disproportionate impacts to this low-income community. If Interchange Alternative 1 is carried forward, additional community outreach would be needed to address this concern and work with those residents to address this issue. The proposed improvements would also have beneficial impacts by improving safety and mobility, and by decreasing travel time. Relocation assistance will be provided in accordance with the *Uniform Relocation Assistance Act* to mitigate adverse effects. Specific impacts resulting from the alternatives are discussed below.

No Action Alternative

The No Action Alternative would not require the relocation of any homes or businesses. However, by doing nothing to address traffic problems within the City, the No Action Alternative would not have a beneficial impact on the community and businesses.

West Bypass Alternatives

In general, the construction of a bypass would enhance traffic flow within the community and benefit all residents, including minorities and low-income populations. No impacts to EJ populations are expected from Alternatives A or B. Alternative H would require three relocations within Cox Mobile Manor, which may house low-income populations.

East Bypass Alternatives

In general, the construction of a bypass would enhance traffic flow within the community and benefit all residents, including minorities and low-income populations. This is especially true in the CBD, which includes the Block Group identified as a low-income population, as the proposed improvements would provide an alternate route for traffic to avoid the CBD and improve safety within this district for motorists and pedestrians.

Alternatives D and F require relocations within Block Group 1, which is identified as a low-income population area. Within Block Group 1, Alternative D requires 12 (four residential and eight business) relocations and Alternative F requires two residential relocations. No impacts to EJ populations are expected from Alternative G.

Interchange Alternatives

In general, the construction of any of the Interchange Alternatives would enhance traffic flow within the community and benefit all residents, including minorities and low-income populations.

Alternative 1 would require 18 relocations within Cox Mobile Manor, which may house low-income populations. Alternative 3 would require three relocations within Cox Mobile Manor.

No impacts to EJ populations are expected from Alternatives 1A or 2.

3.4 Would noise levels change?

Traffic noise analysis is required for proposed Federal-aid highway projects that would construct a highway on new location, substantially alter an existing highway, or increase the number of through-traffic lanes. Screening level noise analysis (screening analysis) typically represents a worst-case scenario with higher sound levels than would be predicted by detailed noise analysis and may be used to determine the need for additional analysis. For screening analysis purposes, the ARDOT noise policy requires determining noise levels within 4 dBA of the Noise Abatement Criteria (NAC) values. The screening analysis completed for the proposed project identified NAC Activity Category B and C noise sensitive receptors (receptors) within the project footprint, representing land uses such as residential areas, parks, and churches. The screening analysis threshold would therefore be 63 dBA for NAC Categories B and C. The screening analysis also determined if any noise impacts would occur due to a substantial increase, which occurs when a design year noise level is predicted to increase 10 dBA or more above the existing noise levels. The screening analysis is provided in **Appendix E**.

Sound is anything we hear, while **noise** is unwanted or undesirable sound. **Traffic noise** is a combination of the noises produced by vehicle engines, exhaust, and tires.

A-weighted decibels, abbreviated **dBA**, are an expression of the relative loudness of sounds in air as perceived by the human ear.

No Action Alternative

The No Action Alternative was evaluated using existing conditions for a segment of Hwy. 51. Fifty-three receptors are impacted (66 dBA or more) by the existing noise levels. It should be noted there are no 66 dBA impacted receptors along any of the build alternatives in future conditions except the I-30 portion of Alternative H. One hundred fifty-five (primarily residences but also includes several hotel receptors, one school, and one park) receptors would be affected by future conditions as they are located within the 63 dBA screening analysis threshold. No substantial increases (≥ 10 dBA) are predicted. Noise level increases would be attributable to projected design year traffic volumes.

Access points such as driveways and intersections are present along Hwy. 51. For engineering reasons, it would therefore not be possible to construct an effective noise barrier accommodating these access points. Therefore, a detailed noise analysis is not recommended for the No Action Alternative.

West Bypass Alternatives

Based on the screening analysis results, no receptors outside of the proposed ROW are predicted to experience noise impacts for Alternatives A or B. For Alternative H, no receptors outside of the proposed ROW are predicted to experience noise impacts for the route on new location. However, for the portion of Alternative H north and south of Hwy. 51 (i.e., the collector and merge lanes along I-30), five residences are predicted to be affected by noise within a distance of 550 feet from the centerline under future build conditions. Seven residences were predicted to experience noise impacts (≥66 dBA) within

a distance of 450 feet and nine residences are impacted under existing conditions.

East Bypass Alternatives

Screening analysis results indicate no receptors outside of the proposed ROW are predicted to experience noise impacts for Alternatives F or G. For Alternative D, substantial increases (≥ 10 dBA) are predicted for eight residences with noise levels ranging from 10.6 to 12.6 dBA above ambient measurements. One residence would be within the 63 dBA screening analysis threshold at a distance of 50 feet from the centerline under the future build conditions. As a result of potential substantial increases for eight receptors, a detailed noise analysis would be warranted if Alternative D is chosen as a Preferred Alternative.

Interchange Alternatives

Screening analysis results indicate the proposed ROW encompasses the future build 63 dBA screening analysis threshold at a distance of 20 feet from the centerline. Therefore, no residences would be within the 63 dBA screening analysis threshold under the future build conditions and no substantial increases (≥ 10 dBA) are predicted.

3.5 How would the project affect parks and recreation areas?

As shown in **Figure 17**, the Riverfront Park (Park) is located within the project study area. The Park is considered a Section 4(f) resource and is subject to protections. The Park also received Land *and Water Conservation Fund* (LWCF) *Act* funds in 1989, affording it additional protections under Section 6(f). Potential recreational impacts and Section 4(f) and Section 6(f) requirements are discussed below.

The Park is owned and maintained by the City of Arkadelphia and recreational features include an outdoor performance stage/amphitheater, a trail along the Ouachita River, and picnic tables.

Section 4(f) resources are those protected by Section 4(f) of the US Department of Transportation (USDOT) Act. Section 4(f) resources include publicly owned parks, national wildlife and refuge areas, and significant historic sites.

The **LWCF** is a federal program that provides funds for the acquisition of land and water for the benefit of all recreating Americans. It is prohibited to convert property acquired or developed with LWCF grant money to non-recreational purposes without approval from the National Park Service, which administers the LWCF.

No Action Alternative

The No Action Alternative would have no effect on the Park.

West Bypass Alternatives

Alternatives A, B, and H would have no effect on the Park.

Figure 17: Arkadelphia Riverfront Park

East Bypass Alternatives

Alternative F would require approximately 1.0 acres of the west side of the Park to be converted to ROW. While impacts would be minimized to the extent possible during detailed design, there would still be impacts to this resource. This area within the Riverfront Park primarily functions as a portion of the Park's parking lot. The parking lot spaces within the proposed ROW would be permanently relocated outside of proposed ROW. Additionally, traffic along 1st St., especially by large trucks, would increase at the park. Increased truck traffic along 1st St. could hinder public access to the Park, which is currently only accessible by vehicle from 1st Street.

If Alternative F is identified as a Preferred Alternative, a Section 4(f) evaluation will be conducted to assess whether the project would harm the protected features, assets, or activities that make the Park important for recreation. Additionally, mitigation and National Park Service approval will be necessary to meet Section 6(f) requirements.

Interchange Alternatives

Interchange Alternatives 1, 1A, 2, and 3 would have no effect on the Park.

3.6 How would the project area's visual quality be affected?

Visual quality impacts are determined by predicting viewer responses to changes in the project area's visual resources.

Overall, the project study area east of 26th St. is relatively flat while the area west of 26th St. has hilltops and valleys that vary significantly in elevation. Elevations range from approximately 180 to 350 feet above mean sea level along the West Bypass Alternatives and Interchange Alternatives and from 150 to 240 feet along the East Bypass Alternatives. Except for the urban areas surrounding Alternative D and the urban areas at the Interchange Alternatives, alternative corridors are mostly wooded. Long distance views are uncommon due to a combination of elevation uniformity (primarily to the east), the screening effect of structures (in urban areas), and the screening effect of wooded areas (in new location routes). There are no officially designated scenic areas or visually sensitive resources in the project area.

A visual impact assessment technical memorandum (including a scoping questionnaire and visual impact definitions) is provided in **Appendix F**.

Visual resources include features such as roadway elements like cross sections and construction materials, buildings and other manmade structures, and vegetation.

No Action Alternative

The No Action Alternative would not result in changes to visual resources.

West Bypass Alternatives

Project corridors of the West Bypass Alternatives primarily consist of undeveloped wooded areas. Most commercial areas within the project area lack landscaping and are not architecturally uniform in appearance. Additionally, several sections within the residential and commercial areas lack sidewalks, curbs, and gutters.

All the West Bypass Alternatives would result in temporary and minor impacts to visual resources during construction as well as permanent changes to travelers' and neighbors' visual resources by creating new infrastructure and clearing vegetation. However, this is not anticipated to be out of character with the existing views, as highways are already incorporated into the visual character of their locations and are compatible with surrounding land development principles. Nevertheless, impacts may be adverse for residential neighbors for whom views of the roadway would become prominent.

Project viewers include **travelers** (drivers, bicyclists, and pedestrians) with views from the road and **project neighbors** (residents and businesses) with views to the road.

Additionally, Alternative H would remove existing buildings within its immediate footprint and would also introduce a structure (I-30 overpass) that would be relatively higher than others in the surrounding area. These changes would alter the corridor's appearance to both travelers and project neighbors.

Adverse impacts to overall visual quality are not expected as a result of the West Bypass Alternatives. As applicable, local planning and development guidelines would be taken into consideration during final design to ensure visual compatibility of the Preferred Alternative.

East Bypass Alternatives

Alternative D's project corridor consists primarily of residential and commercial areas. The project corridors of Alternatives F and G primarily consist of undeveloped wooded areas, some agricultural fields, and the UPRR. Alternative G also crosses the Ouachita River. Most commercial and residential areas within the corridors are similar to those described for the West Bypass Alternatives.

Overall temporary and permanent visual impacts resulting from the East Bypass Alternatives would be identical to those discussed for the West Bypass Alternatives regarding the introduction of new infrastructure and the removal of existing structures and vegetation. Additionally, Alternatives F and G would introduce structures that are relatively higher than others in the surrounding area, which would increase neighbors' views of them and expand travelers' views of the surrounding area. For Alternative F and D, several residences and businesses would be in close proximity to the proposed roadway. However, the proximities of residential and commercial structures would not exceed zoning codes. Depending on viewer exposure and sensitivity, these changes could be experienced as either beneficial, neutral, or adverse.

Adverse impacts to overall visual quality are not expected as a result of any of the East Bypass Alternatives. As applicable, local planning and development guidelines would be taken into consideration during final design to ensure visual compatibility of the Preferred Alternative.

Interchange Alternatives

The project corridor of the Interchange Alternatives primarily consists of commercial areas. Temporary and permanent visual impacts resulting from the Interchange Alternatives are identical to the bypass alternatives with the exception that the Interchange Alternatives would not introduce any structures that are higher than others in the surrounding area. Features similar to the proposed improvements are already incorporated into the visual character of the corridor and are compatible with surrounding land

development principles. Nevertheless, impacts may be adverse for residential neighbors for whom views of the roadway would become prominent.

Adverse impacts to overall visual quality are not expected as a result of any of the Interchange Alternatives. As applicable, local planning and development guidelines would be taken into consideration during final design to ensure visual compatibility of the Preferred Alternative.

3.7 Will any historic properties be affected by the project?

Section 106 of the *National Historic Preservation Act of 1966* requires agencies to consider the effects of federal actions to historic properties. In compliance with Section 106 requirements, the FHWA is conducting ongoing consultation with the appropriate Native American tribes. Consultation with the State Historic Preservation Officer (SHPO) was also conducted under Section 106 and is provided in Appendix C.

Records were checked to determine if historic properties have been documented in the project area. Checked records include the archeological site files kept by the Arkansas Archeological Survey (ARAS) and the historic structure database kept by the Arkansas Historic Preservation Program (AHPP). The Architectural Resources Survey (ARS) prepared for this project determined there are no properties/standing structures listed or considered eligible for listing in the National Register of Historic Places (NRHP) within, or immediately adjacent to, the project footprint. The final archeological assessment for this project has not been finalized; however, the preliminary archeological assessment indicates two properties of interest are in the project area. One of the properties has been recommended not NRHP-eligible, while the eligibility of the other has not yet been determined.

Cultural resources include elements of the built environment (buildings, structures, or objects) or evidence of past human activity (archeological sites). Cultural resources listed on or eligible for inclusion in the National Register of Historic Places (NRHP) are defined as **historic properties**.

A Phase I cultural resources survey that includes shovel tests will be conducted for the Preferred Alternative once it is identified. The survey report documenting the results of the survey, quantifying impacts to historic properties, and stating recommendations will be submitted to the SHPO for review. If no historic properties are identified, a recommendation of no further work will be submitted to the SHPO. Should any of the properties be found eligible or potentially eligible for nomination to the NRHP, and avoidance is not possible, site-specific data recovery plans would be prepared, and data recovery would be carried out at the earliest practicable time. The ARS and additional information on historic properties is provided in **Appendix G**.

No Action Alternative

The No Action Alternative would have no impacts on historic properties.

West Bypass Alternatives

The two properties of interest described above are within the Alternative A footprint.

East Bypass Alternatives

The two properties of interest described above are within the Alternative G footprint.

Interchange Alternatives

Based on the ARS and preliminary checks with ARAS and AHPP, none of the Interchange Alternatives (1, 1A, 2, or 3) would have impacts on historic properties.

3.8 How would water resources, wetlands, streams, and floodplains be impacted?

The Arkansas Department of Health (ADH) public water supply database was reviewed to identify surface water intakes, wellheads, or associated protection areas in the project area. A wellhead protection area is associated with the Arkadelphia Waterworks in the project vicinity; however, the ADH indicated that the project does not present concerns. Impacts to this water resource are therefore not anticipated. If any permanent impacts to private drinking water sources resulted from this project, action would be taken to mitigate these impacts.

Wetlands are areas that can support vegetation adapted for life in wet soil conditions. Wetlands are protected under the *Clean Water Act* because they provide flood control, aid in water quality, and provide wildlife habitat.

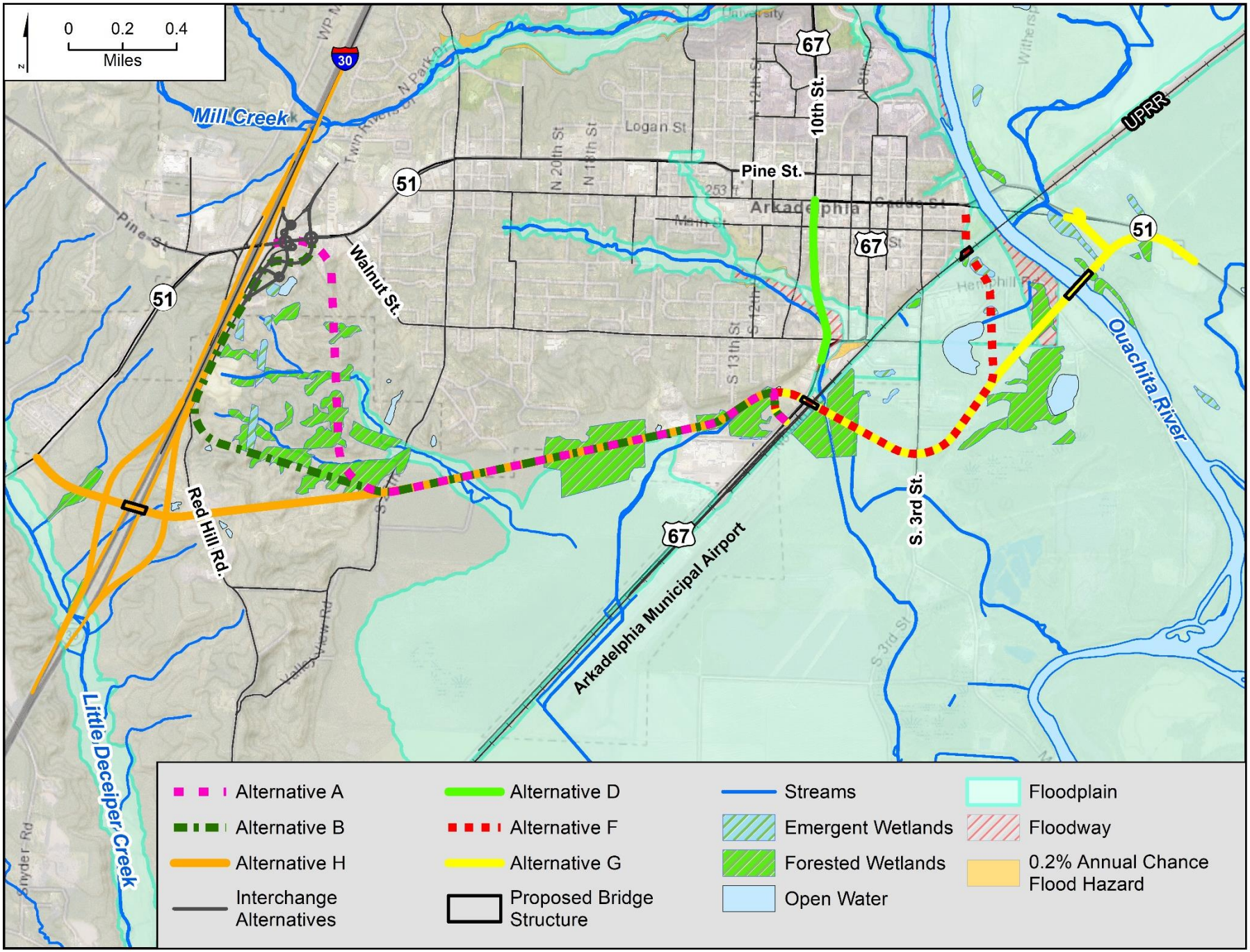
A review of waters and wetlands within the project area revealed the presence of three perennial streams (the Ouachita River, Mill Creek, and Little Deceiper Creek), several intermittent streams (unnamed tributaries to the above-listed perennial streams), and numerous emergent and forested wetlands. Floodplain impacts were assessed using Federal Emergency Management Agency (FEMA) data. **Figure 18** shows the preliminarily identified wetlands and streams, as well as the floodplains located in the project study area. A full wetland delineation will be conducted for the areas impacted by the Preferred Alternative upon identification. Additional information on the preliminary wetland assessment is provided in **Appendix H**.

Parallel streams are those that run parallel to the proposed roadway project. These streams are differentiated from perpendicular crossings because they could potentially incur significantly more impacts.

For any of the build alternatives, most stream impacts are expected to be minimal; however, construction may result in the realignment of any streams located parallel to the alternatives. Compliance with the *Clean Water Act* (CWA) - United States Army Corps of Engineers (USACE) Section 404 permit program, is required for any stream impacts. Once the Preferred Alternatives are identified and funding is available for final design and ROW acquisition, a wetland delineation will be conducted and the appropriate Section 404 permit will be determined. Unavoidable impacts to streams and/or wetlands would be mitigated by using an approved stream and/or wetland mitigation bank with a proximity factor applied as the project is not within the service area of any mitigation banks.

The ***Clean Water Act*** (CWA) is a federal regulation governing activities that could have harmful effects on the quality of the nation's water bodies. Section 404 of the CWA governs discharge of material into water bodies. Section 402 of the CWA governs the discharge of pollutants into water bodies. Section 401 of the CWA gives the states the authority to regulate the discharges that may affect water quality.

Figure 18: Wetlands, Streams, and Floodplains within Project Site



For any of the build alternatives, temporary impacts to water quality have the potential to occur during the construction phase of the project due to increased soil disturbance and associated runoff. Upon project completion and vegetation regrowth, water quality should return to pre-construction levels. All build alternatives will obtain coverage under the National Pollutant Discharge Elimination System (NPDES) general permit for Construction Activities. The provisions of this permit include implementing a Stormwater Pollution Prevention Plan (SWPPP) to minimize or prevent the discharge of pollutants during construction activities. Therefore, stormwater runoff would be controlled and monitored according to applicable federal regulations. Additionally, water quality regulations required by the Arkansas Department of Environmental Quality (ADEQ) will be implemented.

For any of the build alternatives, associated floodplain impacts would result in a no net rise of the floodplain elevation or affect water surface elevations.

Floodplains are areas that become covered by water in a flood event. A 100-year floodplain would be covered by a flood event that has a 1% chance of occurring (or being exceeded) each year, and is the category commonly used for insurance and regulatory purposes.

Table 5 summarizes the number of stream crossings and the total acreage of impacted wetlands and floodplains associated with each alternative.

Table 5: Wetland, Stream, and Floodplain Impacts

Alternative and Location		Wetland Impacts	No. of Stream Crossings	Floodplain / Floodway Impacts
N/A	No Action	0 acres	0	0 acres
West Bypass	Alternative A	25.3 acres	5	6.2 acres
	Alternative B	23.2 acres	3	6.2 acres
	Alternative H	20.0 acres	12	10.5 acres
East Bypass	Alternative D	0 acres	1	2.4 acres
	Alternative F	7.2 acres	3	33.3 acres
	Alternative G	9.4 acres	3	49.6 acres
Interchange Alternative	Interchange 1	0 acres	0	0 acres
	Interchange 1A	0 acres	0	0 acres
	Interchange 2	0.2 acres	0	0 acres
	Interchange 3	0 acres	0	0 acres

No Action Alternative

The No Action Alternative would not have wetland, stream, or floodplain impacts.

West Bypass Alternatives

Under Alternative A, one of five stream crossings involves a parallel stream. Under Alternative B, one of three stream crossings involves a parallel stream. For Alternative H, three of its 12 stream crossings involve a parallel stream. Of the West Bypass Alternatives, Alternative H would cause the largest number of stream crossings and floodplain/floodway impacts and the least number of wetland impacts.

East Bypass Alternatives

Alternative D requires crossing one parallel stream and incurs the fewest impacts to water resources compared to the other build alternatives. Alternative G involves crossing the Ouachita River and would require construction of a new span bridge. Approximately 1.3 miles upstream of the proposed bridge, the Ouachita River is considered an Ecologically Sensitive Waterbody by the ADEQ. Of the East Bypass Alternatives, Alternative D requires the fewest impacts, followed by Alternative F. Alternative G requires the greatest amount of impacts to water resources, with substantially more floodplain impacts than any other alternative.

Interchange Alternatives

Interchange Alternatives 1, 1A, and 3 would require no wetland, stream, or floodplain impacts. Alternative 2 would impact 0.2 acre of wetlands but has no stream or floodplain impacts.

3.9 How would wildlife and protected species be affected by the project?

Undeveloped project areas primarily consist of deciduous and coniferous woodlands, scrub-shrub vegetation, cleared pastures or agricultural fields, and the Ouachita River. Numerous types of wildlife and their respective habitats occur throughout the project area and include aquatic, avian, forested, and open-land terrestrial species.

For federally-listed species, the U.S. Fish and Wildlife Service (USFWS) indicated that 11 threatened, endangered, or proposed threatened species have the potential to be present in or migrate through the project area. No critical habitats are present. Each species identified by USFWS as potentially occurring within the project area can be found in **Table 6** along with an overview of anticipated habitat impacts. The Arkansas Natural Heritage Commission (ANHC) provided information concerning the potential for species of concern to occur within the proposed project corridor. The habitat assessment and preliminary impacts analysis included in **Appendix I** provides detailed information regarding federally-listed species and ANHC species of concern. The USFWS Official Species List and correspondence with ANHC are also included in Appendix I.

An **endangered species** is one that is in danger of extinction throughout all or a significant portion of its range. Endangered species receive the highest level of protection.

A **threatened species** is one that is likely to become endangered in the near future.

Table 6: Preliminary Impact Table for Federally-Listed Species

Species	Preferred Habitat	Habitat Impacts Anticipated?									
		West Bypass			East Bypass			Interchange Alts.			
		Alt. A	Alt. B	Alt. H	Alt. D	Alt. F	Alt. G	Alt. 1	Alt. 1A	Alt. 2	Alt. 3
Northern Long-eared Bat (*Myotis septentrionalis*)	Wooded areas	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Eastern Black Rail (*Laterallus jamaicensis ssp. jamaicensis*)	Wetlands	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	No
Piping Plover (*Charadrius melodus*)	Sandbars	No	No	No	No	No	Yes	No	No	No	No
Red Knot (*Calidris canutus rufa*)	Mudflats	No	No	No	No	No	No	No	No	No	No
Red-cockaded Woodpecker (*Picoides borealis,* Endangered)	Pine Woodlands	Yes	Yes	Yes	No	No	No	No	No	No	No
Ouachita Rock Pocketbook (*Arkansia wheeleri*)	Rivers	No	No	No	No	No	Yes	No	No	No	No
Pink Mucket (*Lampsilis abrupta*)	Rivers	No	No	No	No	No	Yes	No	No	No	No
Rabbitsfoot (*Quadrula cylindrica cylindrica*)	Streams / Rivers	No	No	No	No	No	Yes	No	No	No	No
Spectaclecase (*Cumberlandia monodonta*)	Rivers	No	No	No	No	No	Yes	No	No	No	No
Winged Mapleleaf (*Quadrula fragosa*)	Rivers	No	No	No	No	No	Yes	No	No	No	No
American Burying Beetle (*Nicrophorus americanus*)	Native Vegetation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

For all build alternatives, suitable nesting habitat for migratory birds is present. Construction activities with the potential to affect migratory birds should occur between August 15 and March 31 to avoid the nesting season. Suitable habitat for non-migratory ground nesting birds is also present and construction should occur during the same time frame. Provided construction can be conducted within the non-nesting season, no adverse effects are anticipated to migratory birds.

Due to the proximity to the Ouachita River and the habitats within this area, it is likely that the Bald Eagle (*Haliaeetus leucocephalus*) inhabits the area. Bald Eagles are protected under the *Migratory Bird Treaty Act* and the *Bald and Golden Eagle Protection Act*. Prior to construction of any build alternative, the project area will be surveyed to ensure no nesting eagles are present or will be negatively impacted by the project.

Once the Preferred Alternatives are identified and funding is available for final design and ROW acquisition, consultation with the USFWS will occur to obtain clearance.

No Action Alternative

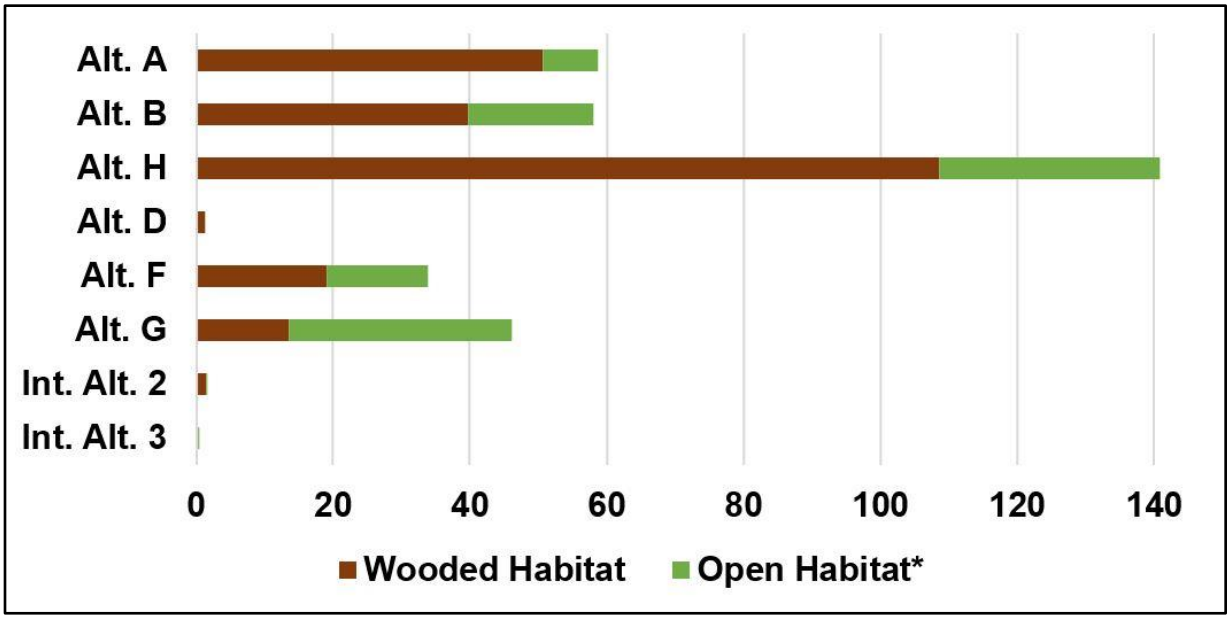
The No Action Alternative would have no effect on wildlife (including federally-listed species) or wildlife habitat.

West Bypass Alternatives

All West Bypass Alternatives occur along new location to some extent and would, therefore, remove natural wildlife habitat. Because most terrestrial species would have some difficulty crossing the bypass, habitat fragmentation also would occur. As it requires the largest amount of disturbance to undeveloped land, Alternative H would remove and fragment the largest amounts of contiguous wildlife habitat, followed by Alternatives A and B. **Figure 19** compares the amount of wooded and open habitat that would be removed by each alignment based on 2016 National Land Cover Database (NLCD).

For federally-protected species, Alternatives A, B, and H, would each impact potentially suitable habitat of the following four species: Northern Long-eared Bat (NLEB), Eastern Black Rail, Red-cockaded Woodpecker, and the American Burying Beetle (Table 6). Foraging and roosting habitat for the NLEB is present within the project limits and the project appears to be within the NLEB consultation area. However, no known maternity roost trees or hibernaculum occur in Clark County based on the NLEB Consultation Area and Final 4(D) Rule Guidance document for Arkansas (USFWS, 2016). For all federally-listed species, USFWS concurrence/clearance will be obtained for the Preferred Alternative prior to construction.

Figure 19: Acres of NLCD Habitat Types* Impacted within each Build Alternative



*In addition to herbaceous areas, open habitat includes crops, hayfields, and pasturelands.

East Bypass Alternatives

All East Bypass Alternatives occur along new location to some extent and would, therefore, remove natural wildlife habitat and fragment habitat. Alternative D would impact the least amount of wildlife habitat as it is entirely within city limits and existing habitat is minimal, already fragmented, and in poor condition. As it requires the largest amount of disturbance to undeveloped land, Alternative G would remove and fragment the largest amounts of contiguous wildlife habitat followed by Alternative F (Figure 19). Additionally, Alternative G requires temporary construction impacts to aquatic habitat due to the proposed bridge over the Ouachita River.

For federally-protected species, all East Bypass Alternatives would impact potentially suitable NLEB habitat (foraging and roosting, but no known maternity roost trees or hibernaculum) and the American Burying Beetle (Table 6). Additionally, Alternative F would impact potentially suitable habitat of the Eastern Black Rail (Table 6). Alternative G would impact the greatest number of species (nine total) due to the proposed bridge over the Ouachita River, which is within the known range of five federally-listed threatened and endangered freshwater mussels. In August 2011, ARDOT personnel conducted a freshwater mussel survey within the Ouachita River to determine the presence or absence of listed mussel species prior to the 2018 construction of the Hwy. 51 bridge. The survey occurred approximately 0.45 mile upstream of the Alternative G proposed bridge. No threatened or endangered species were collected during the 2011 survey and it was determined that the Hwy. 51 bridge construction would not adversely affect threatened or endangered mussel species due to the overall poor quality of the habitat within the survey area. For all federally-listed species, USFWS concurrence/clearance will be obtained for the Preferred Alternative prior to construction.

Interchange Alternatives

The Interchange Alternatives are not anticipated to substantially alter habitat through removal or fragmentation as they are entirely within city limits and existing habitat is minimal, already fragmented, and in poor condition. For federally-protected species, Interchange Alternatives 1, 1A, and 3 are anticipated to impact potentially suitable habitat of two species, while Interchange Alternative 2 is anticipated to impact potentially suitable habitat of three species (Table 6).

3.10 Would any Prime Farmland be impacted by the project?

Prime Farmland and farmland of statewide importance is present within the project area, some of which is currently used for silviculture (west of Hwy. 67) or being farmed (east of the Ouachita River). Appendix C provides a copy of the Farmland Conversion Rating Form that was submitted to and received from the Natural Resources Conservation Service. **Figure 20** shows the amount of prime farmland or farmland of statewide importance to be converted by each alternative.

Prime farmland is defined by the U.S. Department of Agriculture as land that has the best combination of characteristics for producing crops. In some areas, land that does not meet the criteria for prime or unique farmland is considered to be **farmland of statewide importance** and may include lands that are nearly prime farmland and produce high crop yields when treated and managed using acceptable farming methods.

No Action Alternative

Since new ROW would not be needed, Prime Farmland would not be acquired or converted under the No Action Alternative.

West Bypass Alternatives

Alternative H would convert the largest amount of prime farmland and farmland of statewide importance to transportation uses, while Alternative B would convert the least among the West Bypass Alternatives.

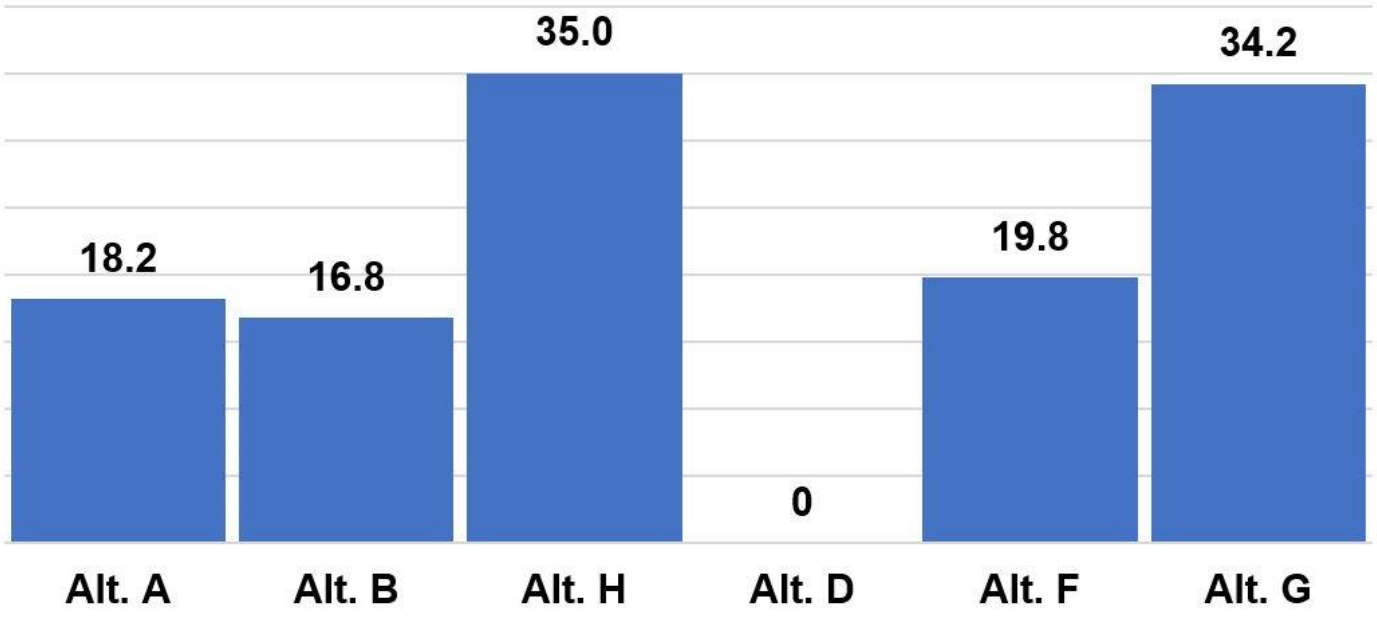
East Bypass Alternatives

Alternative G would convert the largest amount of prime farmland and farmland of statewide importance to transportation uses for the East Bypass Alternatives, followed by Alternative F (Figure 20). Alternative D does not contain prime farmland as it is entirely within city limits.

Interchange Alternatives

Interchange Alternatives 1, 1A, 2, and 3 are entirely within city limits and, therefore, do not contain prime farmland.

Figure 20: Acres of Prime Farmland or Farmland of Statewide Importance to be Converted



3.11 Are there any hazardous materials, wastes, or contaminated sites in the project area?

A **hazardous material** is any item or chemical that can cause harm to people, plants, or animals when released into the environment

A site assessment and database search of ADEQ and Environmental Protection Agency (EPA) records were performed to determine if any hazardous materials were located in the project area. As shown on **Figure 21**, one historical underground storage tank (UST), one UST with a previous leaking underground storage tank (LUST) case that currently has active aboveground storage tanks (ASTs), and two USTs with previous LUST cases that currently have active USTs are located in the immediate project study area. Additionally, one electrical substation is present in the project vicinity. Two of the USTs are located near the Interchange Alternatives just east of the I-30/Hwy. 51 interchange and are associated with current gasoline stations (Exxon and Citgo). Summarized below are potential impacts under each alternative.

No Action Alternative

The No Action Alternative would not have any effects on hazardous material or waste sites.

West Bypass Alternatives

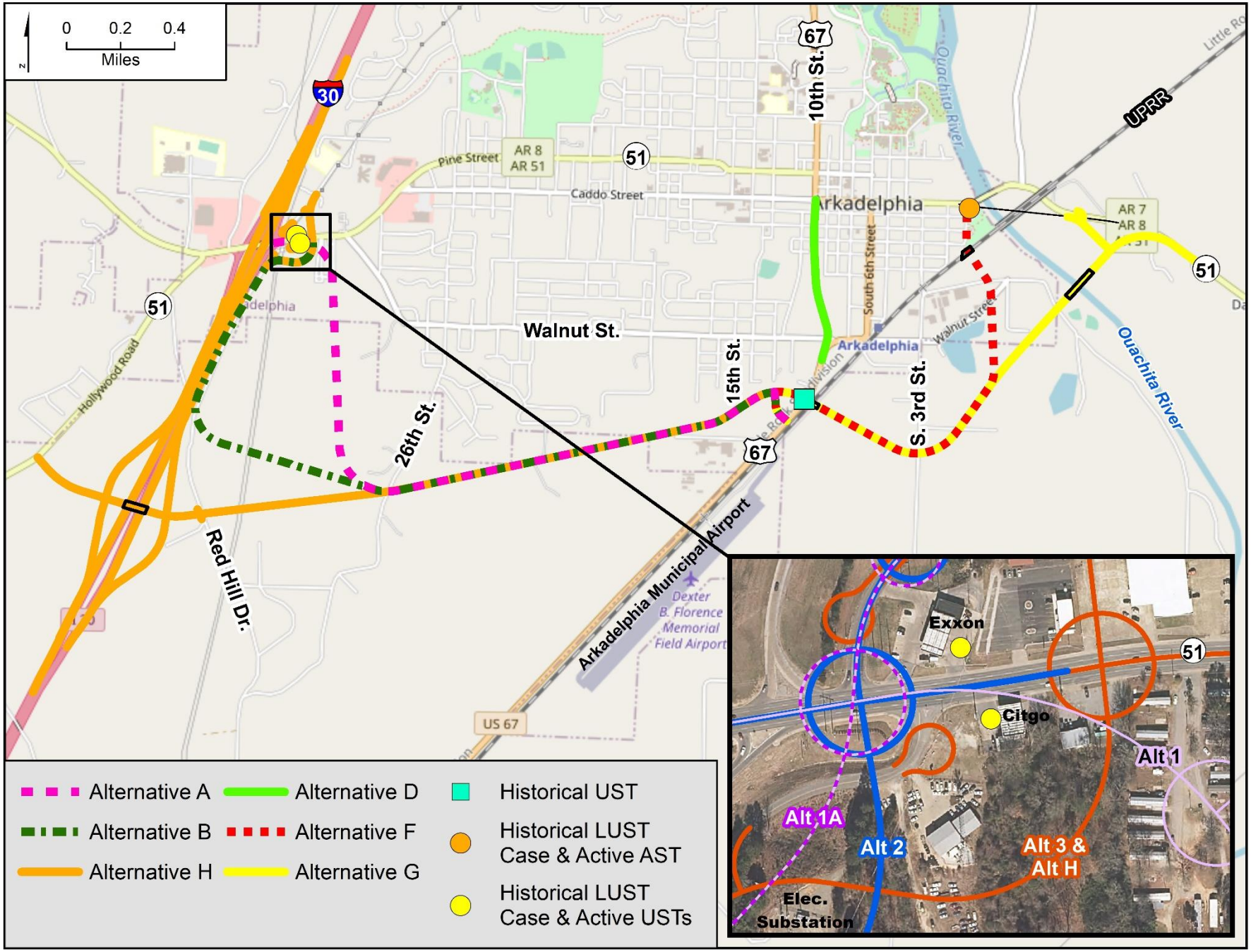
None of the West Bypass Alternatives come into contact with any known hazardous materials, wastes, or contaminated sites. However, all West Bypass Alternatives cross an unknown fill area located southwest of the terminal end of S. 15th St. and on property owned by Siplast Incorporated.

East Bypass Alternatives

Alternative F would result in impacts to two hazardous materials/waste sites: an historical UST site and a site with a historical LUST case. The historical UST site, shown in the photograph below, is adjacent to Hwy. 67 and has no associated ADEQ permitting information but appears to have once functioned as a service station. This building is one of the relocations associated with Alternative F. The historical LUST site, which is located southeast of the intersection of Hwy. 51 and 1st St., had a confirmed leak in 1998 and a no further action letter issued by ADEQ the following year. This site historically had several USTs and currently has five aboveground storage tanks (ASTs). No building structures on this site would be relocated, but the proposed ROW for Alternative F does encroach onto the property so some property acquisition would be required.

Alternative G would only impact the historical UST site, which is one of the relocations associated with its alignment.

Figure 21: Hazardous Material and Hazardous Waste Sites



Interchange Alternatives

Alternatives 1, 1A, and 2 would result in impacts to an Exxon gasoline station with active USTs that also has a previous LUST case recorded. This site is also a relocation impact associated with each of these alternatives. Based on ADEQ available records, it is unknown if the Exxon's LUST case resulted in environmental contamination, but a no further action letter was issued by ADEQ. The Exxon site currently has three active USTs with capacities ranging from 4,000-12,000 gallons; closure and/or removal of these tanks would be required.

Alternative 1 would additionally impact a Citgo (formerly Shell) gasoline station with active USTs that also has a previous LUST case recorded. This site is also a relocation impact associated with this alternative. Based on ADEQ available records, the extent of environmental contamination resulting from the leak is unknown, but a no further action letter was issued by ADEQ. The Citgo site currently has two active USTs with capacities ranging from 6,000-8,000 gallons and one 6,000-gallon UST that is temporarily out of service. Closure and/or removal of all three of these tanks would be required.

Alternative 3 would require no gas station relocations or tank closures.

No impacts to the electrical substation, which has the potential for PCB (polychlorinated biphenyls) contamination to be present, are anticipated by any Interchange Alternative.

For the build alternatives involving LUST sites, it is possible that future excavations could encounter pockets of subsurface contamination in or near LUST sites. Similar risk of contamination is present with any facility historically or currently associated with gasoline or service stations. All USTs would be removed by an ADEQ licensed contractor qualified for UST removal operations. If hazardous materials are identified, observed, or accidentally uncovered by any ARDOT personnel, contracting company(s), or state regulating agency, work would be halted, and the appropriate entities would be notified. Prior to resuming construction, the type of contaminant and extent of contamination would be identified. If necessary, a remediation and disposal plan would be developed. All remediation work would be conducted in conformance with the ADEQ, EPA, and Occupational Safety and Health Administration (OSHA) regulations.

Additionally, an asbestos survey by a certified asbestos inspector would be conducted on each building identified for demolition. If the survey detects the presence of any asbestos-containing materials, plans would be developed for the safe removal of these materials prior to demolition. All asbestos abatement work would be conducted in accordance with ADEQ, EPA, and OSHA asbestos abatement regulations.

3.12 Does the project have any indirect effects?

All build alternatives would have the potential for stormwater runoff due to ground disturbance during construction and, therefore, may temporarily cause indirect impacts to surface water quality. Those alternatives that are additionally impacting streams and/or wetlands (all but Interchange Alternatives 1, 1A, and 3), would have a greater potential for these indirect

Indirect effects are reasonably foreseeable effects that may be caused by the project but would occur in the future or outside of the project area.

impacts. These temporary impacts would likely include increased rates of sedimentation in some areas or even sources of surface water pollutants such as petroleum or related pollutants from construction vehicles. However, best management practice (BMP) measures would be implemented as part of the design and construction of the bypass to avoid and/or reduce indirect impacts to surrounding resources resulting from stormwater runoff.

Additionally, indirect impacts to land use and other growth effects related to induced changes in the pattern of land use or population density may occur with all the build alternatives. An analysis of induced growth effects was conducted and city planners/officials for the City of Arkadelphia (City) and Clark County were interviewed. The County stated they thought the project would induce development in general, but they did not identify any reasonably foreseeable projects or have further comment. The City's comments are incorporated in the below sections and provided in **Appendix J**.

Induced growth impacts are changes in the location, magnitude, or pace of future development that result from changes in accessibility caused by the project. An example of an induced growth effect is commercial development occurring around a new interchange and the environmental impacts associated with this development.

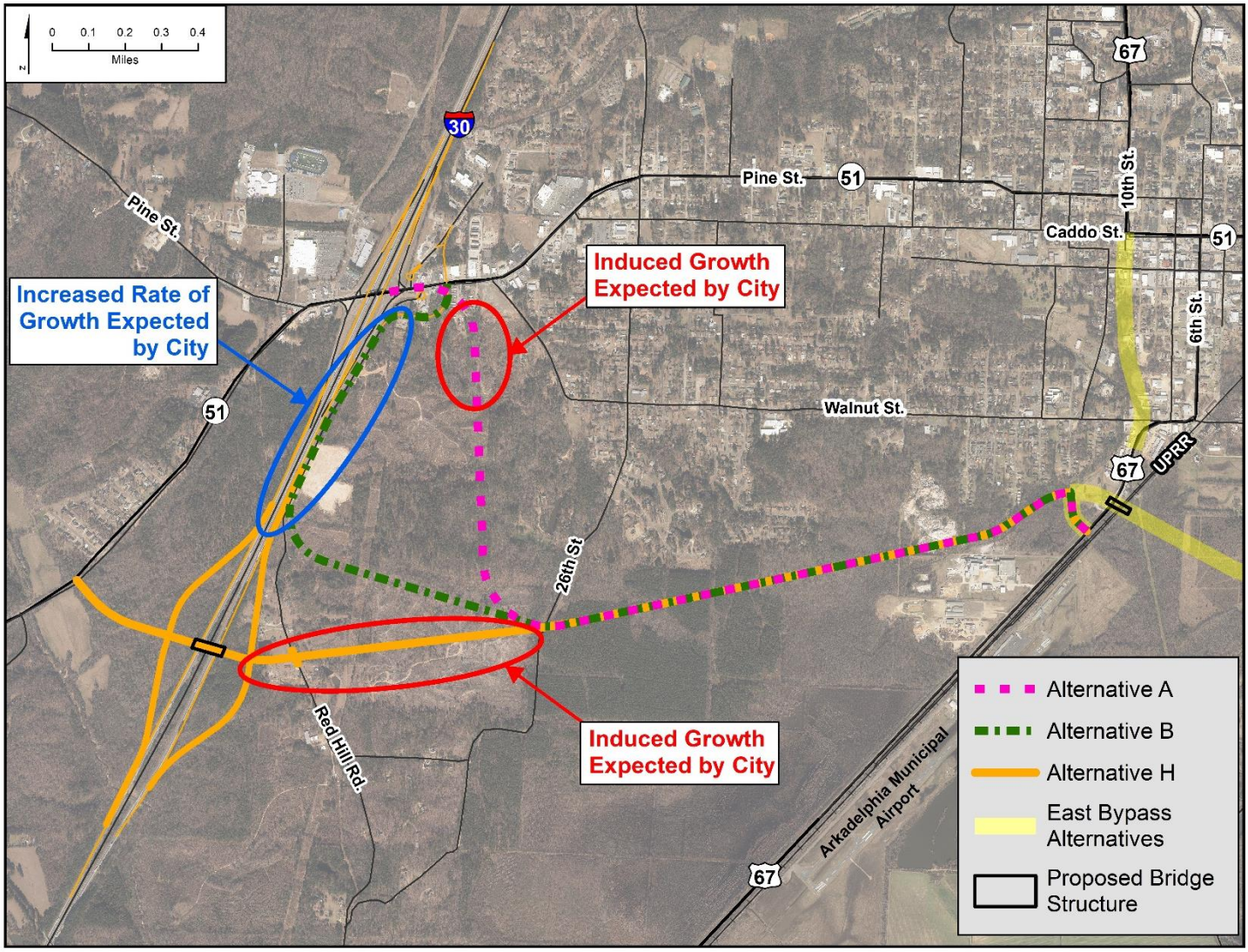
No Action Alternatives

The No Action Alternative would not result in any indirect effects.

West Bypass Alternatives

Although all bypass alternatives have the potential to increase accessibility at each of their terminal ends, not all of these areas can accommodate induced growth as numerous areas are already significantly developed and there is not a strong market demand for development given the city's relatively flat population growth. However, the City does expect the proposed project to result in induced growth at three locations (Error! Reference source not found.), one of which would be increasing the g rowth rate of an already growing area. Induced growth associated with Alternative H is expected near the proposed alignment's connection with Red Hill Road. Sensitive resources in this area that would be impacted include aquatic features (approximately 1 acre of ponds) and wildlife habitat (36 acres of woodlands and 4 acres of open habitat). Induced growth associated with Alternative A is expected near the north terminal end of the alignment and sensitive resources in this area that would be impacted include 14 acres of wooded habitat. Development along Alternative B near I-30 and Red Hill Rd. is expected independently of the proposed project (per City), but it is believed the proposed project would increase the rate of development in that area. Urban development (resulting from induced growth) is associated with temporary decreases in water quality, commonly due to increased rates of sedimentation from stormwater runoff from disturbed soils during construction. However, significant impacts to aquatic features are not anticipated as BMPs related to minimization of erosion and sedimentation would be required for future developments. Additionally, induced growth impacts are not expected to substantially impact wildlife habitat (including federally-protected species) as undeveloped land is abundant in the region and future projects would occur within areas immediately adjacent to already-urbanized areas and further habitat fragmentation would be minor.

Figure 22: Areas Expected by City to Experience Induced Growth as a Result of the Project



East Bypass Alternatives

Indirect impacts to land use and other growth effects related to induced changes in the pattern of land use or population density were not identified for East Bypass Alternatives.

Interchange Alternatives

Interchange Alternatives 1, 1A, and 3 would not result in any indirect effects to water quality. Indirect impacts to land use and other growth effects related to induced changes in the pattern of land use or population density may occur for any of the Interchange Alternatives, but these indirect impacts are primarily associated with the above-described West Bypass Alternatives rather than Interchange Alternatives.

3.13 Does the project have any cumulative impacts?

Cumulative impacts are defined as the impact on the environment which results from the incremental direct and indirect impacts of the proposed action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other action (CFR 40 §1508.7).

The No Action Alternative would not result in any cumulative effects.

For the build alternatives, cumulative impacts to aquatic features (wetlands and streams) and wildlife habitat (including federally-listed species) are analyzed. Direct impacts to other resources were not considered substantial enough to warrant a cumulative impacts analysis. For example, although floodplains are identified to have direct impacts, the effects are not considered substantial since no net rise in the floodplain would occur and no building structures are proposed. Additionally, although indirect and direct land use impacts are anticipated, undeveloped areas represent a large portion of the study area, land resources are not considered a declining resource, and the proposed project is not incompatible with current zoning. In addition to the direct and indirect impacts considered, Appendix J lists other actions and provides an assessment of impacts resulting from those other actions.

Aquatic Features

The resource study area (RSA) for the cumulative analysis for water resources was delineated using the 12-digit hydrologic unit code (HUC12) watershed unit. Based on USFWS National Wetlands Inventory (NWI) data, an estimated 680 acres or streams and 670 acres of wetlands and ponds are found in the RSA. These numbers are likely lower than the actual wetlands acres. Many of the wetlands and streams within undeveloped areas of the RSA are in good condition while those adjacent to or within Arkadelphia are typically more degraded due to human-effects such as channelization. As summarized in Section 3.8, direct impacts to aquatic features could total to approximately 35 acres of wetland impacts and up to 16 stream crossings depending on the combination of alternatives selected (for an estimated total of 36 acres). Indirect impacts described in Section 3.12 include up to 1 acre of impact to ponds. The direct and indirect impacts to aquatic features equate to an estimated 37 acres of impacts to water resources. These impacts combined with an additional 2-acre impact of aquatic features from other actions is anticipated within the RSA. This results in an estimated cumulative impact to 39 acres of aquatic features, which is approximately 0.1% of the total acreage for water resources found within the RSA.

Wildlife Habitat

The cumulative analysis for wildlife habitat utilized the same RSA identified for aquatic features as this RSA includes several diverse biotic communities and is sufficiently large-enough to encompass the home range of the majority of wildlife species utilizing the area. Based on the NLCD for 2016 (most recent year available), an estimated 52% of the RSA is wooded and 34% is open habitat (with the remaining 14% developed). These numbers are likely higher than the actual habitat present given the data is four years old and intended to be approximations. Much of the wildlife habitat in rural areas is in good condition while those adjacent to Arkadelphia and major roadways are more fragmented and of poorer quality (as contiguous habitats are generally of higher quality than fragmented sites). Direct

impacts to wildlife resources summarized in Section 3.9, could total to approximately 195 acres of habitat impacts depending on the combination of alternatives selected. Indirect impacts described in Section 3.12 include up to 54 acres of habitat impacts. In addition to these direct and indirect impacts, Appendix J lists other actions and provides an assessment of impacts resulting from those other actions. The project's direct and indirect impacts to wildlife habitat equate to an estimated 249 acres. Additionally, an estimated 36 acres of habitat within the RSA due to other actions is anticipated to be impacted. This results in an estimated cumulative impact to 285 acres of wildlife habitat, which is approximately 1.2% of the total acreage of undeveloped land within the RSA.

Cumulative Impact Conclusion

For both of the above-described resources, minimization and mitigation for impacts are expected. The Arkadelphia Bypass and presumably any other action using federal funding would comply with the ESA and with the CWA as it relates to stormwater (Section 402) and point-source (Section 404) discharges. While substantial impacts to wetlands can result in wildlife habitat loss and habitat fragmentation and may limit the ability to reconstruct and repair wetlands (Dahl, 2011), the above-discussed impacts to water resources and wildlife habitat are considered minor compared to the amount of each resource that remains. Additionally, as the proposed project and the reasonably foreseeable projects occur within areas immediately adjacent to already-urbanized areas or adjacent to a roadway, further habitat fragmentation would be minor. Thus, for the above-described reasons, coupled with the use of construction BMPs, substantial cumulative impacts to water resources and wildlife habitat are not expected to influence other areas of the watershed.

3.14 What resources are either not present or not affected?

Air Quality

The proposed project is located within an area designated by the EPA as being in attainment for all the National Ambient Air Quality Standards (NAAQS). There may be temporary, localized impacts to surrounding residential or commercial communities during construction of the project due to emissions from construction equipment. These air quality impacts are considered negligible. There are no air quality impacts associated with the No Action or the build alternatives.

Landforms and Geology

The landforms and geological resources of the area would not be impacted by the proposed project.

Wild and Scenic Rivers

No Wild and Scenic Rivers or other federal or state regulated waterbodies would be impacted by the proposed project.

Chapter 4 – Results and Recommendations

This chapter summarizes environmental analysis results and recommendations.

4.1 What are the results of this EA?

Table 7 and **Table 8** summarize natural and social environmental impacts of the alternatives for comparison purposes. These tables also include public comments and city preferences. Each of the build alternatives would provide beneficial improvements to mobility and safety within the study area, and all would similarly affect land use. None of the build alternatives would have permanent adverse impacts to the overall visual quality of the project area. Impacts to historic properties are unknown at this time but are addressed in Section 3.7.

Overall, the environmental analysis of the proposed project did not identify any significant impacts to the natural and social environment resulting from the No Action Alternative or any of the build alternatives. All build alternatives address the purpose and need of the project. The alternative identified as the Preferred Alternative will be a combination of an East Bypass, a West Bypass, and an Interchange Alternative. The Preferred Alternative will demonstrate a balance between best addressing the purpose and need and requiring the least impacts.

4.2 What commitments have been made?

The ARDOT's standard commitments regarding relocation procedures, hazardous waste abatement, cultural resources discovery, water quality impact controls, and revegetation have been made for this project. They are as follows:

- All land acquisitions and relocation assistance will comply with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act* of 1970. A residential relocation plan for the Preferred Alternative will be required prior to any acquisition of property. A review of sufficient replacement housing within the City of Arkadelphia should be included in a relocation plan prior to acquisition.
- If hazardous materials, unknown illegal dumps, or USTs are identified or accidentally uncovered by ARDOT personnel or its contractors, the type and extent of the contamination will be determined according to the ARDOT's response protocol. In cooperation with the ADEQ, appropriate remediation and disposal methods will be determined.
- An asbestos survey will be conducted by a certified asbestos inspector on each building slated for acquisition and demolition. All detected asbestos-containing materials will be removed prior to demolition in accordance with ADEQ, EPA, and Occupational Health and Safety regulations.

Table 7: Summary of Impacts for Bypass Alternatives

Resource Category Impacted	No Action	West Bypass Alternatives			East Bypass Alternatives		
		Alt. A	Alt. B	Alt. H	Alt. D	Alt. F	Alt. G
ROW Cost[1]	$0	$93,050	$117,120	$3,178,200	$1,965,120	$377,750	$191,700
Construction Cost[2]	$0	$10.6	$12.5	$46.4	$3.8	$10.4	$18
Total Cost[2]	$0	$10.7	$12.6	$49.6	$5.8	$10.8	$18.2
Alternative Length (miles)	0	2.5	2.9	3.0	0.6	1.8	2.4
Total ROW Required (acres)	0	56.0	63.7	141.5	5.3	29.1	38.0
Residential Relocations	0	0	0	6†	4	3	1
Business Relocations	0	0	0	6	10	2	2
Total Relocations Required	0	0	0	12†	14	5	3
Low-Income Areas Present	0	0	0	1	1	1	0
Noise (# affected of receivers)	155	0	0	22	8	0	0
Park Impacts	0	0	0	0	0	1	0
Wetland Impacts (acres)	0	25.3	23.2	20.0	0	7.2	9.4
Stream Crossings (number)	0	5	3	12	1	3	3
Floodplains/Floodway (acres)	0	6.2	6.2	10.5	2.4	33.3	49.6
T&E Species Affected[3]	0	4	4	4	2	3	10
Farmland Present (acres)	0	18.2	16.8	35.0	0	19.8	34.2
Known HazMat Sites	0	0	0	0	0	2	1
Bypass Operations (2040 vpd)	N/A	1,600	1,600	2,200	3,000	1,200	1,100
Interchange LOS[4]	N/A	N/A	N/A	A / A	N/A	N/A	N/A
Public Comment (#pro/#con)	N/A	27 / 10	24 / 9	N/A	29 / 12	13 / 16	20 / 13
City Preference	N/A		1st		1st		

FOOTNOTES

[1] Estimated cost in 2019 dollars.

[2] Estimated cost in millions of 2019 dollars.

[3] T&E Species Affected" refers to the number of federally-protected species that have potentially suitable habitat impacted by the project.

[4] Level of Service (LOS) in 2040 at Hwy. 51/Professional Park Dr. intersection for a signal / roundabout. LOS range from A (best operating conditions from traveler's perspective) to F (worst conditions).

† Includes homes located at Cox Mobile Manor.

Table 8: Summary of Impacts for Interchange Alternatives

Resource Category Impacted	No Action	Hwy. 51 Interchange Alternatives			
		Alt. 1	Alt. 1A	Alt. 2	Alt. 3
ROW Cost[1]	$0	$2,678,700	$668,000	$746,250	$2,656,000
Construction Cost[2]	$0	$8.2	$5.9	$9.6	$4.8
Total Cost[2]	$0	$10.9	$6.6	$10.3	$7.5
Alternative Length (miles)	0	N/A	N/A	N/A	N/A
Total ROW Required (acres)	0	6.1	1.3	3.4	5.3
Residential Relocations	0	18†	0	0	3†
Business Relocations	0	4	1	1	5
Total Relocations Required	0	22†	1	1	8†
Low-Income Areas Present	0	1	0	0	1
Noise (# affected of receivers)	0	0	0	0	0
Park Impacts	0	0	0	0	0
Wetland Impacts (acres)	0	0	0	0.2	0
Stream Crossings (number)	0	0	0	0	0
Floodplains/Floodway (acres)	0	0	0	0	0
T&E Species Affected[3]	0	2	2	3	2
Farmland Present (acres)	0	0	0	0	0
Known HazMat Sites	0	2	1	1	0
Traffic Operations (2040 vpd)[4]	N/A	26,000	26,000	26,000	23,500
LOS at Key Intersection[5]	N/A	B / A	B / A	B / A	B / A
Public Comment (#pro/#con)	N/A	12 / 17	N/A	15 / 11	11 / 17
City Preference	N/A				1st

FOOTNOTES:

[1]Estimated cost in 2019 dollars.

[2]Estimated cost in millions of 2019 dollars.

[3]"T&E Species Affected" refers to the number of federally-protected species that have potentially suitable habitat impacted by the project.

[4]Estimated vehicles per day (vpd) in 2040 at Hwy. 51/Professional Park Dr. intersection.

[5]Level of Service (LOS) in 2040 at Hwy. 51/Professional Park Dr. intersection for a signals/roundabout. LOS range from A (best operating conditions from traveler's perspective) to F (worst conditions).

† Includes homes located at Cox Mobile Manor.

- A structure survey to determine eligibility for inclusion in the NRHP and a Phase I cultural resources survey that includes shovel tests will be conducted for the Preferred Alternative. A report documenting the survey results and recommendations will be prepared and submitted for SHPO review. Should any of the sites be determined as eligible or potentially eligible for nomination to the NRHP and avoidance is not possible, site-specific data recovery plans would be prepared, and data recovery would be carried out at the earliest practicable time. All borrow pits, waste areas, and work roads will be surveyed for historic properties when locations become available.
- A formal wetland delineation on the Preferred Alternative will be conducted and submitted to the USACE and the appropriate Section 404 permit will be determined at that time.
- Project construction will be in compliance with all applicable CWA, as amended, requirements. This includes obtaining Section 401 Water Quality Certification; Section 402 National Pollutant Discharge Elimination Permit; and Section 404 Permit for Dredged or Fill Material.
- Stream and wetland mitigation will be offered at an approved mitigation bank site with a proximity factor applied as the project is not currently within the service area of any mitigation banks with available credits. The mitigation ratio will be approved during the Section 404 permitting process.
- A Water Pollution Control Special Provision would be incorporated into the contract to minimize potential water quality impacts.
- Appropriate action will be taken to mitigate any permanent impacts to private drinking water sources should they occur due to this project.
- A wildflower seed mix will be included in the permanent seeding for the project.
- Clearance/concurrence from USFWS regarding federally-protected species will be obtained for the Preferred Alternative prior to construction.

4.3 Is the NEPA process finished?

If this EA is approved by the FHWA for public dissemination, a Location Public Hearing would be held. After a review of comments received from citizens, public officials, and public agencies, the Preferred Alternatives will be identified. Detailed design to 60% level and additional environmental studies such as Cultural Resource Surveys and noise barrier analysis will be completed, as needed. Once these additional efforts are completed, a Design Public Hearing will be held. After a review of comments received from citizens, public officials, and public agencies a FONSI document would be prepared and submitted to the FHWA or the project would be recommended for an EIS study if significant, unmitigable impacts are identified. If the FHWA issues a FONSI, it would identify the Selected Alternative and conclude the NEPA process.

Chapter 5 – References

Arkansas Department of Transportation (ARDOT). 2006. Arkadelphia Truck Route Study. 21 pages.

Arkansas Department of Transportation (ARDOT). 2013. Arkadelphia Bypass Study. 65 pages.

Arkansas Department of Transportation (ARDOT). 2019. Statewide Transportation Improvement Program (STIP) 2019-2022. Available online at: https://www.arkansashighways.com/stip/stip.aspx

Arkansas Department of Transportation (ARDOT). 2020. Arkadelphia Bypass Traffic Study. 82 pages.

American Association of State Highway Transportation Officials (AASHTO). 2016. *A Policy on Design Standards – Interstate System*. 8 pages.

Dahl, T.E. 2011. Status and Trends of Wetlands in the Conterminous United States 2004 to 2009. U.S. Department of the Interior; Fish and Wildlife Service, Washington, D.C. 108 pages.

U.S. Census Bureau. 2010. 2010 Census Block Data. Table QT-P3, Race and Hispanic or Latino Origin. Available online at: https://data.census.gov/cedsci/

U.S. Census Bureau. 2017. American Community Survey (ASC) 5-Year Estimates. Table DP05, Demographic and Housing Estimates. Available online at: https://data.census.gov/cedsci/

U.S. Census Bureau. 2018. American Community Survey (ASC) 5-Year Estimates. Table S0101, Population Age and Sex. Available online at: https://data.census.gov/cedsci/

U.S. Fish and Wildlife Service (USFWS), Arkansas ES Field Office. 2016. NLEB Consultation Area and Final 4(D) Rule Guidance document for Arkansas. 12 pages. Available online at: https://www.fws.gov/arkansas-es/docs/NLEB%20Final%204d%20Rule%20Guidance%20for%20Arkansas.pdf

Appendix A – Arkadelphia Bypass Traffic Study

Arkadelphia Bypass Traffic Study

HWY. 67 TO HWY. 51 (ARKADELPHIA BYPASS) P.E.

ARDOT Job 070442; F.A.P. Number STPC-9013(10)

TABLE OF CONTENTS

Chapter **Page**

Introduction **1**

Existing / No Action Analysis **3**

2018 Existing Volumes 3

Traffic Forecast 6

2040 No Action Volumes 11

Operational Analysis Methodology 14

Intersection Analysis Methodology 14

Roadway Segment Analysis Methodology 15

2018 Existing Conditions 17

2018 Intersection Analysis, Existing Conditions 17

2018 Roadway Segment Analysis, Existing Conditions 22

2040 Future No Action Conditions 24

2040 Intersection Analysis, No Action Conditions 24

2040 Roadway Segment Analysis, No Action Conditions 29

Safety Analysis 30

Alternatives **35**

2040 Alternatives Volumes 35

2040 Alternatives Analsyis 44

2040 Intersection Analysis, Western Alternative Conditions 44

2040 Intersection Analysis, Eastern Alternative Conditions 62

2040 Intersection Analysis, Highway 67 Improvement Alternative Condition 69

2040 Roadway Segment Analysis, Alternative Conditions 74

List of Figures **Page**

Figure 1: Arkadelphia Bypass Study Area 2
Figure 2: 2018 Existing Volumes 4
Figure 3: 2018 Existing Volumes 5
Figure 4: 2040 No Action Design Volumes 12
Figure 5: 2040 No Action Design Volumes 13
Figure 6: Level of Service (LOS) Categories 14
Figure 7: Highway 51 and Highway 67 Safety Review (All Crashes) 33
Figure 8: Highway 51 and Highway 67 Safety Review (KA Crashes) 34
Figure 9: 2040 Western Portion - Alternative 1 Volumes 37
Figure 10: 2040 Western Portion - Alternative 2 Volumes 38
Figure 11: 2040 Western Portion - Alternative 3 Volumes 39
Figure 12: 2040 Western Portion - Alternative 4 Volumes 40
Figure 13: 2040 Western Portion – New Interchange 41
Figure 14: 2040 Eastern Portion - Alternative E and F Volumes 42
Figure 15: 2040 Eastern Portion - Alternative G Volumes 43
Figure 16: 2040 Highway 67 Improvement – Alternative D Volumes 70

List of Tables **Page**

Table 1: Historic ADT Data 7
Table 2: AGR based on the Trend Function 8
Table 3: Projected ADT Based on the Calculated Growth Rate 9
Table 4: Projected ADT Based on County Growth Rate 9
Table 5: Projected ADT Based on Previous Study 10
Table 6: Summary of Growth Rates 10
Table 7: LOS Thresholds for Intersections (Control Delay) 15
Table 8: LOS Thresholds for Two-lane Highways Intersections 16
Table 9: Intersection Analysis – 2018 Existing Conditions – *HCM* 18
Table 10: Intersection Analysis – 2018 Existing Conditions – *SimTraffic* 20
Table 11: Roadway Segment Analysis – 2018 Existing Conditions – *HCM* 23
Table 12: Intersection Analysis – 2040 No Action Conditions – *HCM* 25

Table 13: Intersection Analysis – 2040 No Action Conditions – *SimTraffic* 27
Table 14: Roadway Segment Analysis – 2040 No Action Conditions – *HCM* 29
Table 15: Annual Average Crash Rates (2015 – 2017)..... 31
Table 16: Intersection Analysis – 2040 Alternative 1 (Signals) – *HCM* 45
Table 17: Intersection Analysis – 2040 Alternative 1 (Signals) – *SimTraffic*..... 46
Table 18: Intersection Analysis – 2040 Alternative 1 (Roundabouts) – *HCM*..... 47
Table 19: Intersection Analysis – 2040 Alternative 1 (Roundabouts) – *SIDRA* 48
Table 20: Intersection Analysis – 2040 Alternative 2 (Signals) – *HCM* 49
Table 21: Intersection Analysis – 2040 Alternative 2 (Signals) – *SimTraffic*..... 50
Table 22: Intersection Analysis – 2040 Alternative 2 (Roundabouts) – *HCM*..... 51
Table 23: Intersection Analysis – 2040 Alternative 2 (Roundabouts) – *SIDRA* 52
Table 24: Intersection Analysis – 2040 Alternative 3 (Signals) – *HCM* 53
Table 25: Intersection Analysis – 2040 Alternative 3 (Signals) – *SimTraffic*..... 54
Table 26: Intersection Analysis – 2040 Alternative 3 (Roundabouts) – *HCM*..... 55
Table 27: Intersection Analysis – 2040 Alternative 3 (Roundabouts) – *SIDRA* 56
Table 28: Intersection Analysis – 2040 Alternative 4 (Signals) – *HCM* 57
Table 29: Intersection Analysis – 2040 Alternative 4 (Signals) – *SimTraffic*..... 58
Table 30: Intersection Analysis – 2040 Alternative 4 (Roundabouts) – *HCM*..... 59
Table 31: Intersection Analysis – 2040 Alternative 4 (Roundabouts) – *SIDRA* 60
Table 32: Intersection Analysis – 2040 New Interchange – *HCM* 61
Table 33: Intersection Analysis – 2040 New Interchange – *SimTraffic* 62
Table 34: Intersection Analysis – 2040 Alternative E and F – *HCM*..... 63
Table 35: Intersection Analysis – 2040 Alternative E and F – *SimTraffic* 65
Table 36: Intersection Analysis – 2040 Alternative G – *HCM*..... 66
Table 37: Intersection Analysis – 2040 Alternative G – *SimTraffic*..... 68
Table 38: Intersection Analysis – 2040 Alternative D – *HCM*..... 71
Table 39: Intersection Analysis – 2040 Alternative D – *SimTraffic* 73
Table 40: Roadway Segment Analysis – 2040 Alternative Action Conditions – *HCM*... 75

List of Appendices

Appendix A - Volume Data

Appendix B – Intersection Operational Analysis Results

Appendix C – Roadway Segment Operational Analysis Results

Due to the size of these appendices (1,145 pages in total), they have been removed from this report but are available upon request.

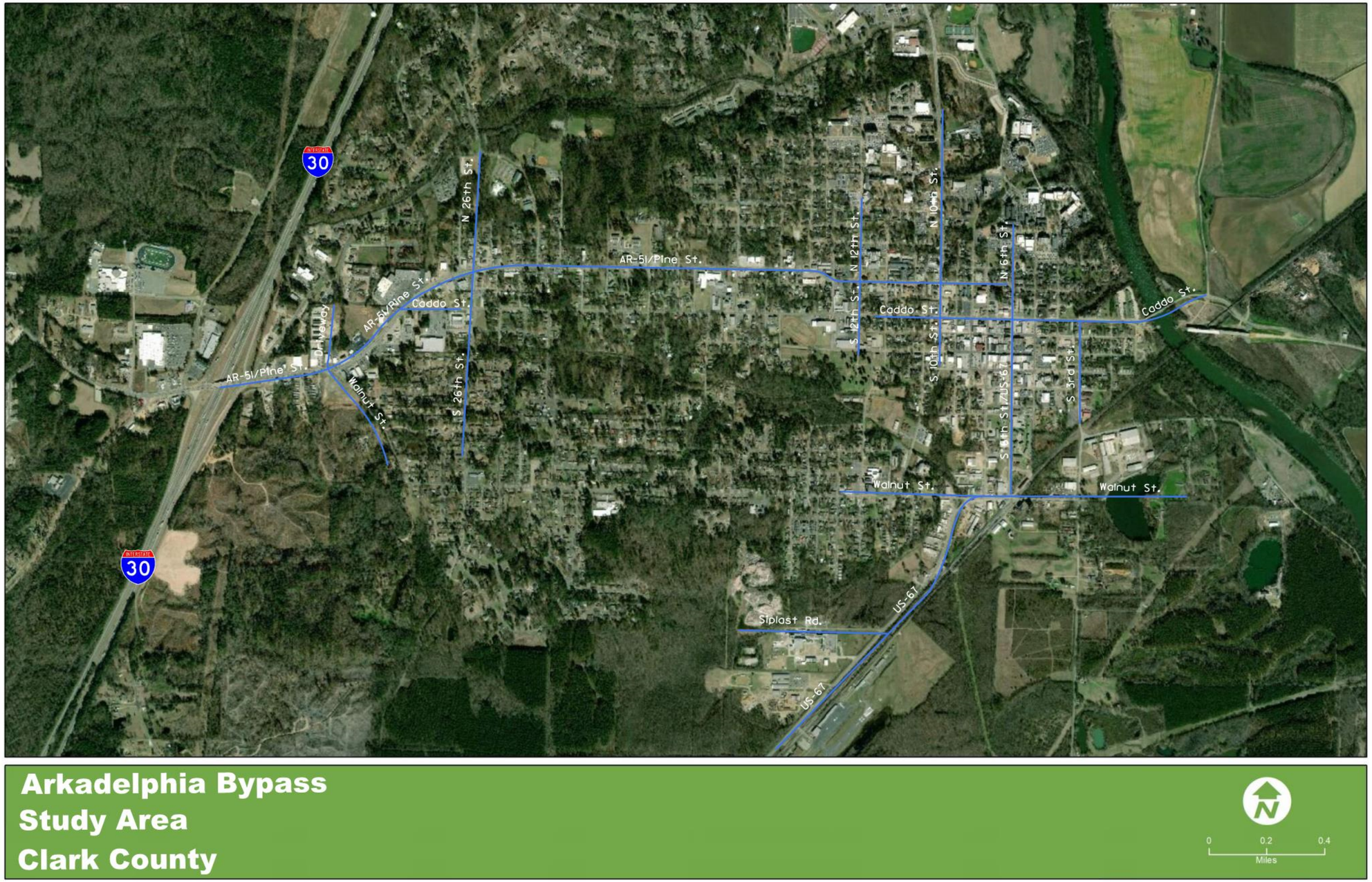
INTRODUCTION

Arkadelphia is adjacent to the only Ouachita River crossing in the region, and this route (Highway 51) continues through the heart of Arkadelphia and provides critical access to Highway 67 and Interstate 30 (I-30). A number of sawmills operate within 40 miles of Arkadelphia, and trucks going to and from the sawmills utilize this river crossing. These trucks must negotiate several difficult turns and pass through the Arkadelphia Central Business District (CBD), which imposes delays on other road users within the city.

In 2013, the Arkansas Department of Transportation (ARDOT) conducted a study to investigate alternate bridge locations and bypass options to better serve the heavy truck traffic and long distance through traffic. Since then, the existing bridge has been replaced at the same location, and no bypass has been constructed.

As part of the NEPA process, Garver reviewed the previous study and is providing an updated traffic and safety study which includes an analysis of the existing and future No Action conditions, safety analysis, and analysis of the new proposed bypass alternatives. **Figure 1** on the following page shows the study area. The following sections of this report document the findings of the traffic and safety analyses.

Figure 1: Arkadelphia Bypass Study Area



EXISTING / NO ACTION ANALYSIS

An updated analyses of existing and future No Action conditions were conducted to identify any safety or operational issues and to provide a basis of comparison for the proposed Action alternatives. The results of the existing and future No Action analyses are described in the following subsections.

2018 EXISTING VOLUMES

In April of 2018, turning movement counts were conducted at key intersections within the study area and included 24-hours of data with percentages of buses and trucks. This data was processed to identify the peak hours, peak hour factors, and percentages of heavy vehicles during the peak hours. For this study area, a single seasonal adjustment factor of 0.98 was applied according to the methodologies outlined in the ARDOT *Traffic Monitoring System Handbook* for an urban principal arterial with data collected in April. No balancing was required between intersections due to the presence of cross streets and driveways between the study intersections.

After the initial volumes were developed, the study area was expanded further west along Pine Street. Additional turning movement counts were collected at key intersections within the added area in September and October of 2018. Seasonal adjustment factors of 0.95 and 0.99 were applied to the October and September counts, respectively, in accordance with the ARDOT *Traffic Monitoring System Handbook* for an urban principal arterial with data collected in these months. As with the original study area, no balancing was required between intersections for the expanded study area due to the presence of cross streets and driveways between the study intersections. The resulting 2018 Existing design volumes are shown in **Figure 2** and in **Figure 3** on the following pages. The raw turning movement data is provided in **Appendix A - Volume Data**.

Figure 2: 2018 Existing Volumes

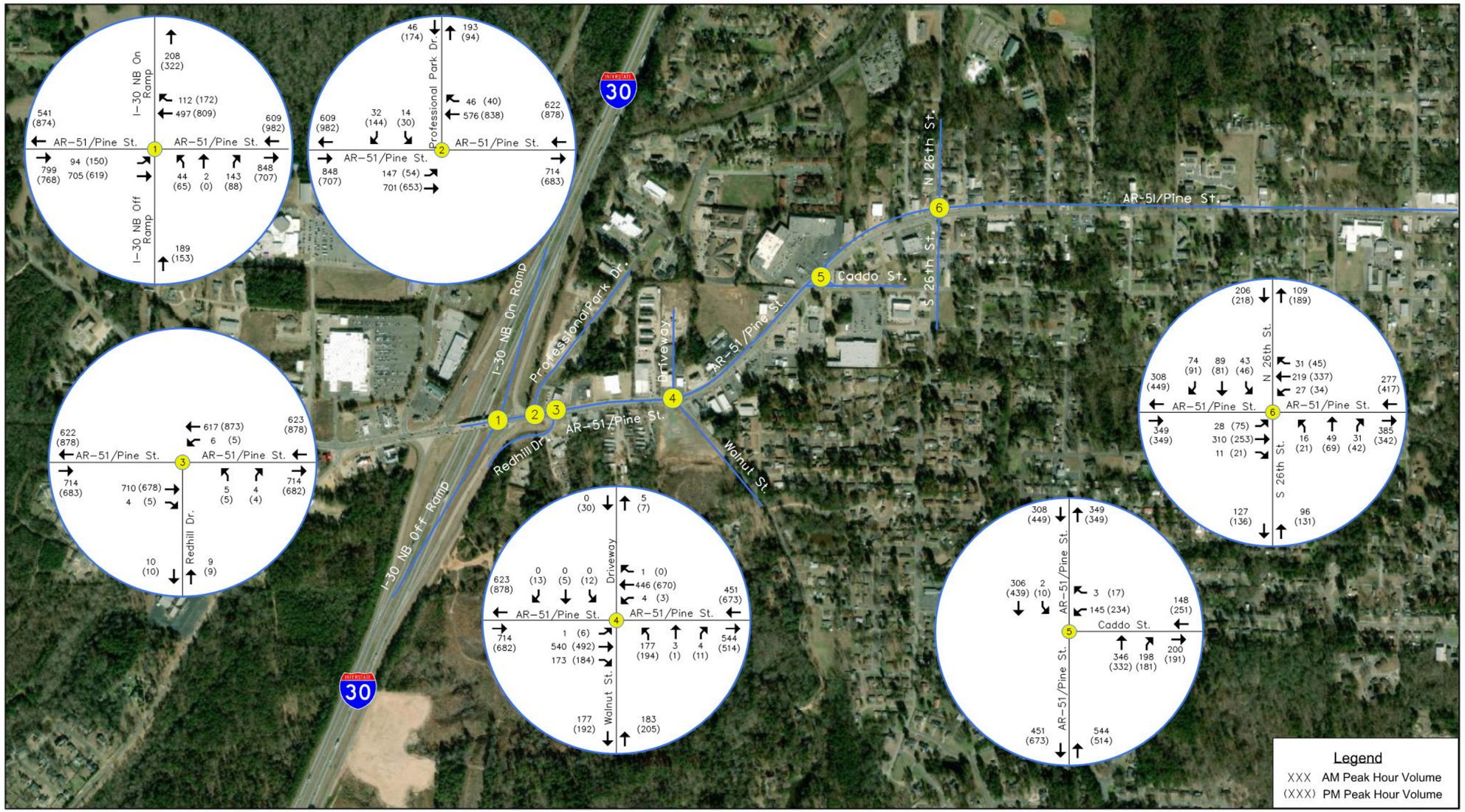
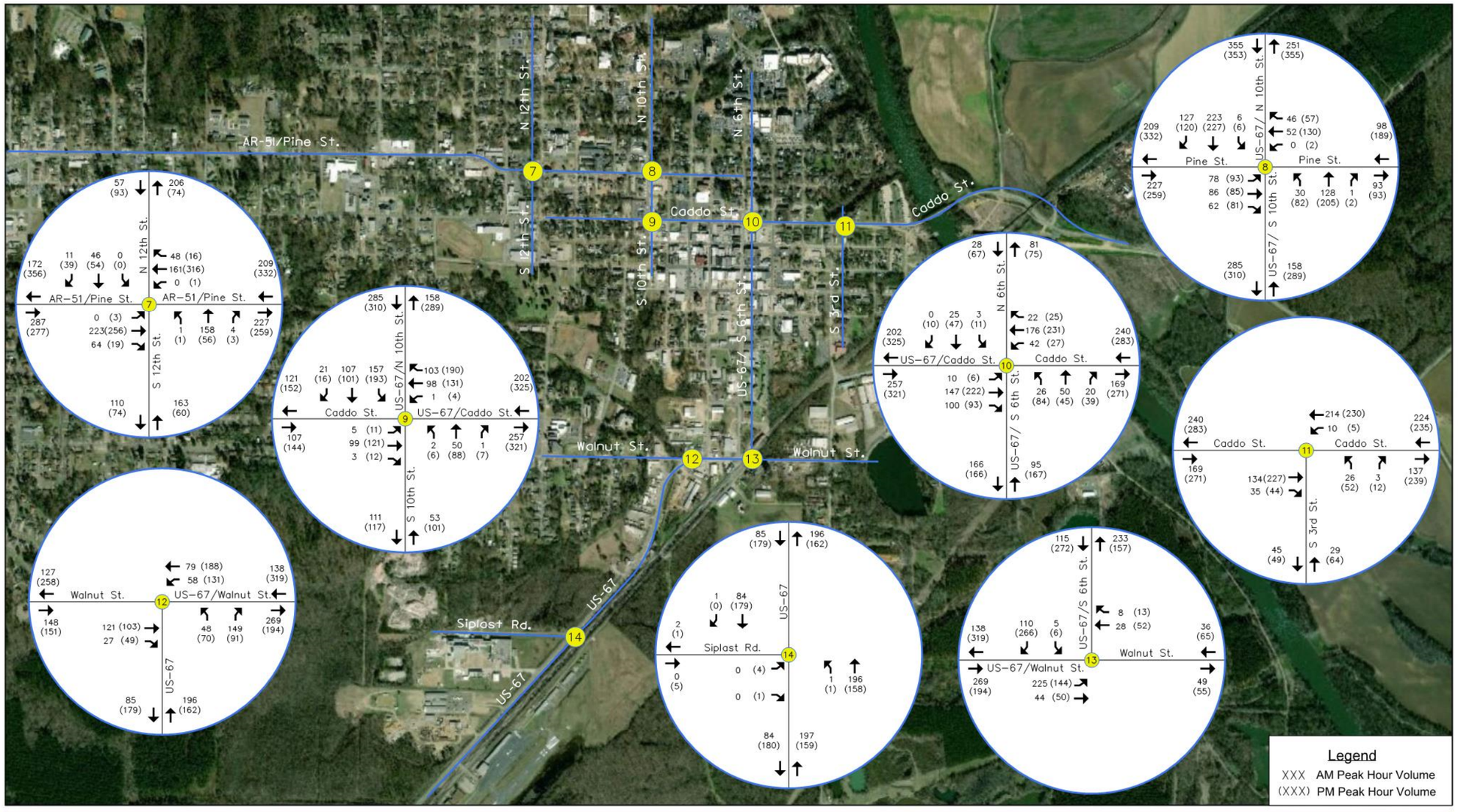


Figure 3: 2018 Existing Volumes



Arkadelphia Bypass
2018 Existing Volumes (2 of 2)
Clark County

0 0.15 0.3 Miles

TRAFFIC FORECAST

From the ARDOT database, fourteen ADT counting stations were identified near or within the study area. All of these stations had over twenty years of data. The historic data was compiled into an Excel sheet and is also shown in **Table 1** on the following page.

Several methods were investigated to determine the growth rate and project future volumes. First, the trend function was used in Excel to project 2038 traffic volumes based on the historic volumes. This function is based on the equation y=mx+b, where y represents the traffic volume and x represents the year. For these calculations, the true "b" value was selected. The projected volumes and resulting growth rates based on the trend function are shown in **Table 2**. Negative growth rates were not considered in determining the appropriate growth rate to use for this traffic study, and all growth rates not utilized are shaded a darker gray.

Table 1: Historic ADT Data

Location	Hwy. 51 East of Ouachita River	Caddo St. (Hwy. 51) - b/t 3rd St. and 4th St.	Caddo St. (Hwy. 67) - b/t 8th St. and 9th St.	10th St. (Hwy. 67) - b/t Pine St. & Caddo St.	Pine St. (Hwy. 51) - b/t Robey St. & 11th St.	Pine St. (Hwy. 51) - b/t Hunter St. & 13th St.	Pine St. (Hwy. 51) - b/t 20th St. & 19th St.	Pine St. (Hwy. 51) - b/t 27th St. & 26th St.	Pine St. (Hwy. 51) - b/t Walnut St. & 29th St.	Pine St. (Hwy. 51) - b/t Red Hill Rd. & Walnut St.	6th St. (Hwy. 67) - b/t Crittenden St. & Carpenter St.	Walnut St. - b/t 11th St. & Hwy. 67	Walnut St. b/t 13th St. & 12th St.	Hwy. 67 - South of Walnut St.
Station	100028	100208	100211	100212	100207	100206	100205	100204	100203	100202	100210	10S096	10S095	100209
1998	3,200	3,000	6,900	8,100	8,300	11,000	11,000	11,000	12,000	14,000	2,500	2,800	3,900	4,100
1999	2,800	4,200	6,300	7,000	6,300	8,400	8,200	8,500	10,000	13,500	2,500	3,050	3,300	4,200
2000	2,800	3,600	6,100	6,900	6,000	8,000	7,300	8,700	11,000	13,000	2,600	3,300	4,500	3,500
2001	3,200	4,100	6,900	7,900	7,300	9,100	9,800	10,000	13,000	15,000	2,800	3,700	4,700	4,200
2002	2,900	4,200	6,200	5,600	6,200	7,400	8,000	8,600	11,000	13,000	2,800	3,400	4,800	3,700
2003	3,000	4,600	6,600	7,400	6,600	8,100	9,000	9,900	13,000	15,000	2,800	4,000	4,800	3,900
2004	3,500	4,800	6,700	7,300	6,200	7,900	8,300	9,600	12,300	14,400	2,600	3,600	5,400	4,200
2005	3,000	4,550	6,400	7,400	7,900	9,200	10,300	10,600	13,300	16,000	2,950	3,800	5,150	3,900
2006	3,300	4,300	7,300	7,600	7,500	9,500	11,100	12,000	16,100	18,800	3,300	4,100	4,900	4,200
2007	3,100	4,000	7,300	7,900	8,100	10,400	10,800	11,400	14,100	17,200	2,900	4,000	5,000	4,200
2008	2,900	4,400	7,000	7,400	7,500	8,000	9,800	10,000	13,000	16,000	2,900	3,700	5,000	3,500
2009	2,900	4,000	7,000	7,500	7,300	8,700	10,000	13,000	14,000	18,000	2,800	3,700	5,000	3,600
2010	3,000	4,500	7,200	7,700	7,600	9,000	11,000	13,000	15,000	18,000	3,000	3,700	5,200	3,600
2011	3,000	4,700	7,700	8,300	7,700	10,000	9,000	9,800	15,000	16,000	3,200	3,600	5,200	4,100
2012	3,000	4,700	7,400	7,800	7,400	7,600	9,700	9,300	12,000	17,000	2,900	3,600	5,300	3,600
2013	2,800	5,300	10,000	11,000	7,800	11,000	9,800	12,000	16,000	17,000	2,800	3,700	5,000	3,300
2014	3,100	5,600	8,800	8,400	7,600	8,700	9,700	11,000	13,000	17,000	3,200	3,700	4,700	3,600
2015	2,300	5,200	7,700	7,800	7,300	8,500	9,400	10,000	13,000	17,000	2,800	3,300	4,800	3,600
2016	3,100	4,800	7,500	7,500	7,100	8,700	9,000	9,900	13,000	17,000	2,800	3,300	4,800	3,500
2017	2,700	4,800	7,500	9,700	6,700	8,100	8,700	10,000	13,000	18,000	2,900	3,500	4,800	3,800
2018	3,000	4,800	7,800	7,700	7,400	8,300	9,400	11,000	14,000	17,000	2,800	3,200	4,700	3,400

Table 2: AGR based on the Trend Function

Location	Hwy. 51 East of Ouachita River	Caddo St. (Hwy. 51) - b/t 3rd St. and 4th St.	Caddo St. (Hwy. 67) - b/t 8th St. and 9th St.	10th St. (Hwy. 67) - b/t Pine St. & Caddo St.	Pine St. (Hwy. 51) - b/t Robey St. & 11th St.	Pine St. (Hwy. 51) - b/t Hunter St. & 13th St.	Pine St. (Hwy. 51) - b/t 20th St. & 19th St.	Pine St. (Hwy. 51) - b/t 27th St. & 26th St.	Pine St. (Hwy. 51) - b/t Walnut St. & 29th St.	Pine St. (Hwy. 51) - b/t Red Hill Rd. & Walnut St.	6th St. (Hwy. 67) - b/t Crittenden St. & Carpenter St.	Walnut St. - b/t 11th St. & Hwy. 67	Walnut St. b/t 13th St. & 12th St.	Hwy. 67 - South of Walnut St.	Average AGR (%)
AGR (%)	-0.68	1.57	1.35	1.46	0.43	0.15	0.33	0.57	0.90	1.37	0.84	0.74	1.05	-0.73	0.90
2018	3,000	4,800	7,800	7,700	7,400	8,300	9,400	11,000	14,000	17,000	2,800	3,200	4,700	3,400	
2038	2,615	6,550	10,190	10,287	8,062	8,546	10,044	12,313	16,750	22,328	3,312	3,710	5,795	2,938	

Next, future volumes were projected using the growth rate calculated based on **Equation 1**.

Equation 1: $V_F = V_P * GF^n$

$GF = (1+AGR/100)$

Where: V_F = future volume

V_P = present volume

GF = growth factor

AGR = annual growth rate (%)

n = number of years

The annual growth rate was calculated based on the 1998 and 2018 ADT for each station as shown in **Table 3** on the following page. Negative growth rates were not considered in determining the appropriate growth rate to use for this traffic study, and all growth rates not utilized are shaded a dark gray.

Table 3: Projected ADT Based on the Calculated Growth Rate

Location	Hwy. 51 East of Ouachita River	Caddo St. (Hwy. 51) - b/t 3rd St. and 4th St.	Caddo St. (Hwy. 67) - b/t 8th St. and 9th St.	10th St. (Hwy. 67) - b/t Pine St. & Caddo St.	Pine St. (Hwy. 51) - b/t Robey St. & 11th St.	Pine St. (Hwy. 51) - b/t Hunter St. & 13th St.	Pine St. (Hwy. 51) - b/t 20th St. & 19th St.	Pine St. (Hwy. 51) - b/t 27th St. & 26th St.	Pine St. (Hwy. 51) - b/t Walnut St. & 29th St.	Pine St. (Hwy. 51) - b/t Red Hill Rd. & Walnut St.	6th St. (Hwy. 67) - b/t Crittenden St. & Carpenter St.	Walnut St. - b/t 11th St. & Hwy. 67	Walnut St. b/t 13th St. & 12th St.	Hwy. 67 - South of Walnut St.	Average AGR (%)
AGR (%)	-0.32	2.38	0.61	-0.25	-0.57	-1.40	-0.78	0.00	0.77	0.98	0.57	0.67	0.94	-0.93	
2018	3,000	4,800	7,800	7,700	7,400	8,300	9,400	11,000	14,000	17,000	2,800	3,200	4,700	3,400	0.66
2038	2,813	7,680	8,817	7,320	6,598	6,263	8,033	11,000	16,333	20,643	3,136	3,657	5,664	2,820	

Next, ARDOT calculates county growth rates across the state. Based on this information provided by ARDOT, a growth factor of 1.198 (AGR = 0.90%) for Clark County was applied to all of the stations within the study area as shown in **Table 4**.

Table 4: Projected ADT Based on County Growth Rate

Location	Hwy. 51 East of Ouachita River	Caddo St. (Hwy. 51) - b/t 3rd St. and 4th St.	Caddo St. (Hwy. 67) - b/t 8th St. and 9th St.	10th St. (Hwy. 67) - b/t Pine St. & Caddo St.	Pine St. (Hwy. 51) - b/t Robey St. & 11th St.	Pine St. (Hwy. 51) - b/t Hunter St. & 13th St.	Pine St. (Hwy. 51) - b/t 20th St. & 19th St.	Pine St. (Hwy. 51) - b/t 27th St. & 26th St.	Pine St. (Hwy. 51) - b/t Walnut St. & 29th St.	Pine St. (Hwy. 51) - b/t Red Hill Rd. & Walnut St.	6th St. (Hwy. 67) - b/t Crittenden St. & Carpenter St.	Walnut St. - b/t 11th St. & Hwy. 67	Walnut St. b/t 13th St. & 12th St.	Hwy. 67 - South of Walnut St.	Average AGR (%)
AGR (%)	0.90														0.90
2018	3,000	4,800	7,800	7,700	7,400	8,300	9,400	11,000	14,000	17,000	2,800	3,200	4,700	3,400	
2038	3,589	5,742	9,331	9,211	8,852	9,929	11,245	13,159	16,748	20,336	3,350	3,828	5,622	4,067	

Volumes and growth rates developed in the previous study used similar methodology and are shown in **Table 5**. They were reviewed for comparison but were not included in the tabulation for this study. Compared to the current study, the previous study utilized a much smaller growth rate.

Table 5: Projected ADT Based on Previous Study

Location	Hwy. 51 East of Ouachita River	Caddo St. (Hwy. 51) - b/t 3rd St. and 4th St.	Caddo St. (Hwy. 67) - b/t 8th St. and 9th St.	10th St. (Hwy. 67) - b/t Pine St. & Caddo St.	Pine St. (Hwy. 51) - b/t Robey St. & 11th St.	Pine St. (Hwy. 51) - b/t Hunter St. & 13th St.	Pine St. (Hwy. 51) - b/t 20th St. & 19th St.	Pine St. (Hwy. 51) - b/t 27th St. & 26th St.	Pine St. (Hwy. 51) - b/t Walnut St. & 29th St.	Pine St. (Hwy. 51) - b/t Red Hill Rd. & Walnut St.	6th St. (Hwy. 67) - b/t Crittenden St. & Carpenter St.	Walnut St. - b/t 11th St. & Hwy. 67	Walnut St. b/t 13th St. & 12th St.	Hwy. 67 - South of Walnut St.	Average AGR (%)
Previous Studies Methodology															
2013	3,000		7,800	9,500	7,800						3,200	-	-	4,100	
2033	3,300		8,600	10,500	8,600						3,600	-	-	4,600	
AGR (%)	0.48	-	0.33	0.33	0.33						0.39	-	-	0.38	0.37

Note: Data from Previous Study was used for comparison, not as a data point in determining the AGR for this study.

Table 6 shows a summary of the various calculated growth rates and the growth rate selected for this study. The negative growths shaded dark gray in the previous tables were not included when calculating the average growth rates for each of the methodologies. Based on these average growth rates for each methodology, a growth rate of 0.80% was selected to project future volumes throughout the study area for this traffic study.

Table 6: Summary of Growth Rates

	Trend Function y-mx+b	Calculated $V_F=V_P*GF$	County	Average AGR (%)	Selected AGR (%)
Avg AGR (%)	0.90	0.66	0.90	0.82	0.80

2040 NO ACTION VOLUMES

The 2040 No Action Design volumes were projected from the 2018 Existing Design volumes using the exponential growth rate of 0.80% which was determined based on the traffic forecast described in the previous subsection. No balancing was required due to the presence of cross streets and driveways between each of the study intersections. The 2040 No Action Design volumes are shown in **Figure 4** and **in Figure 5** on the following pages.

Figure 4: 2040 No Action Design Volumes

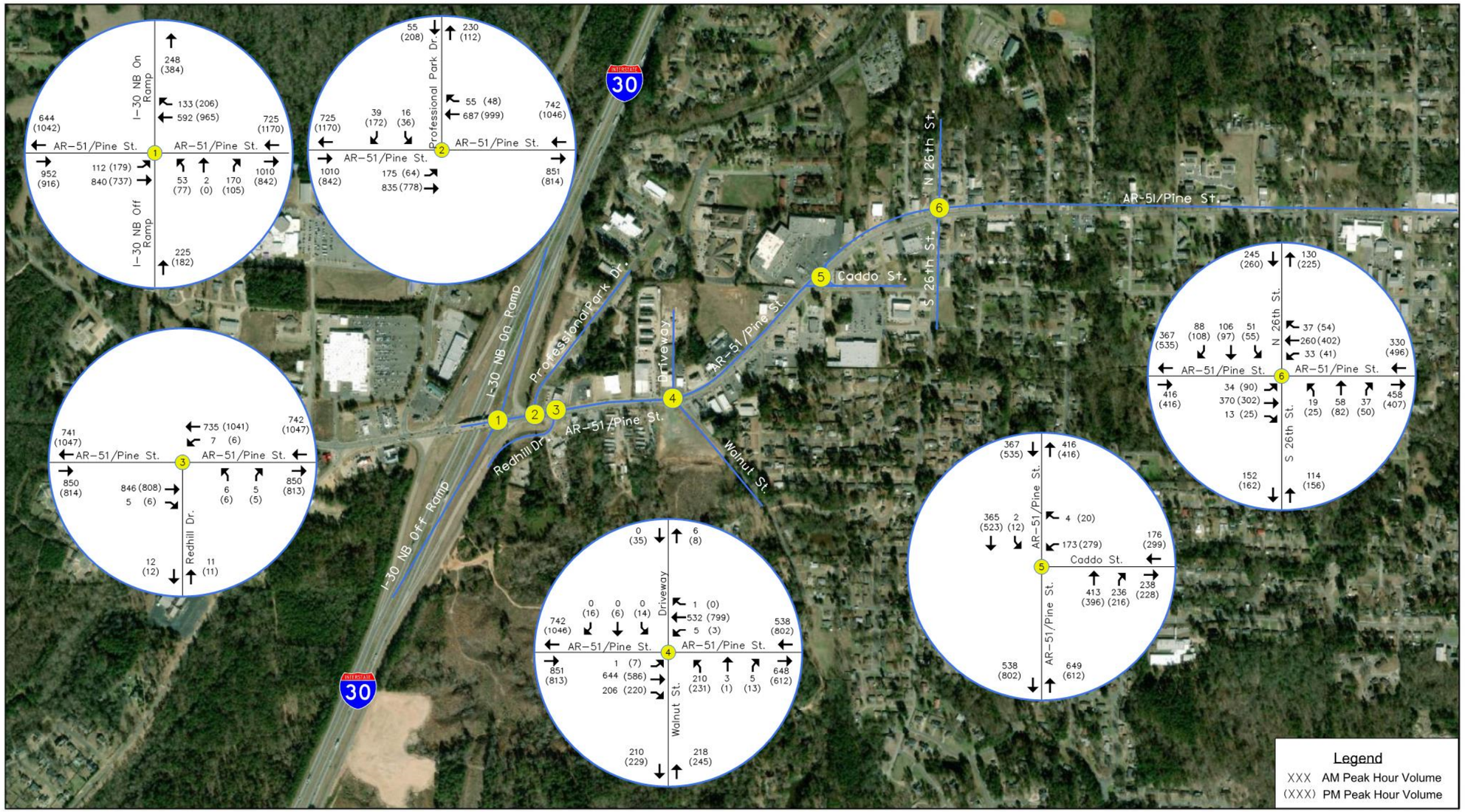
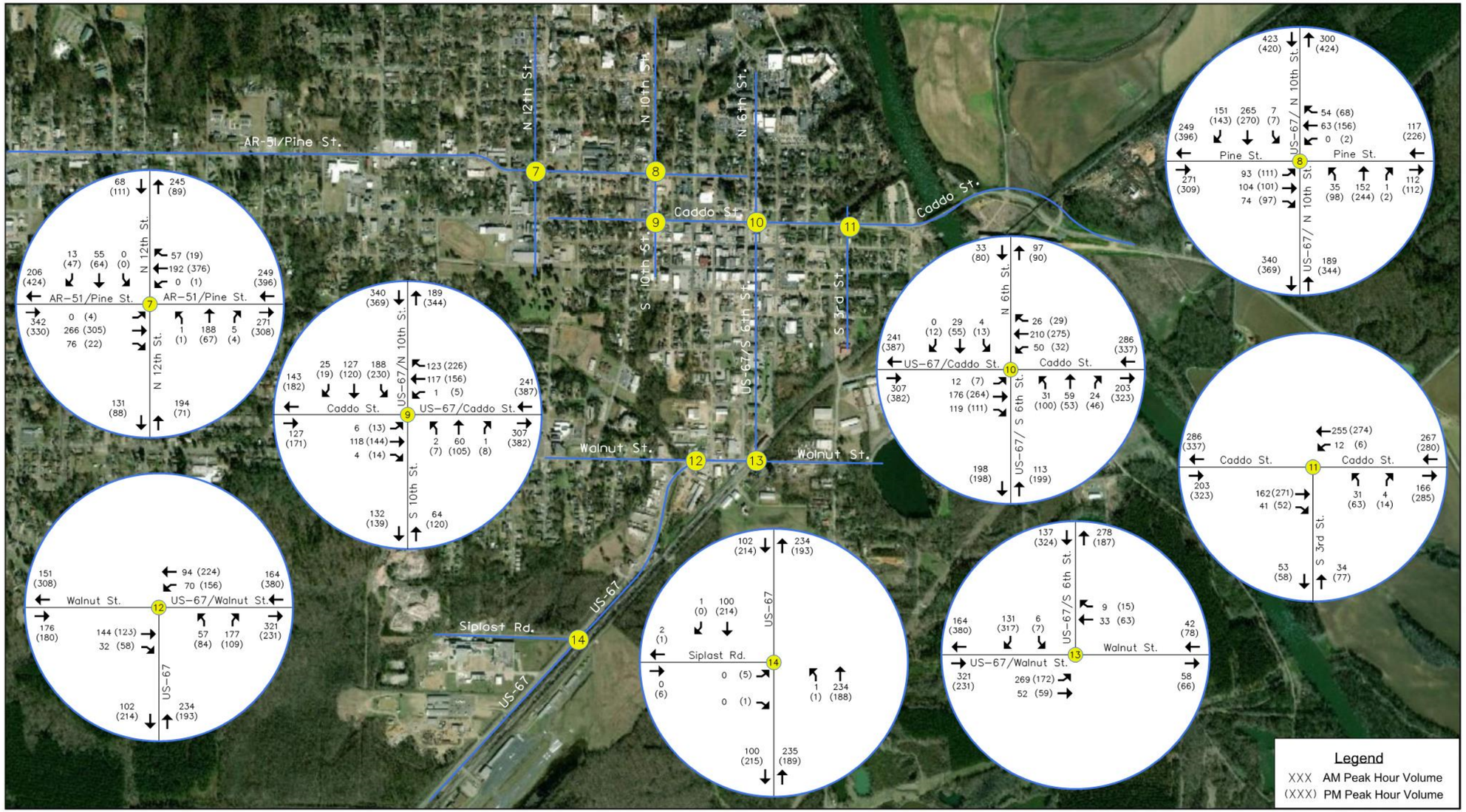


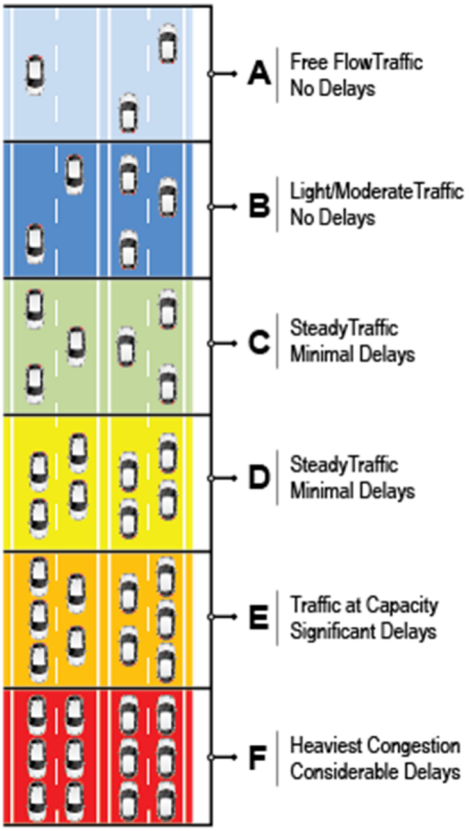
Figure 5: 2040 No Action Design Volumes



OPERATIONAL ANALYSIS METHODOLOGY

The 2018 Existing and 2040 No Action conditions were used to establish a baseline for comparison of the Action Alternatives with regards to congestion. Congestion along the project corridor was evaluated using Level of Service (LOS) as a performance measure. LOS is a qualitative measure used to depict operational conditions within a traffic stream or at an intersection. LOS is typically designated into six categories. These range from LOS A indicating free-flow, low density, or nearly negligible delay conditions to LOS F where demand exceeds capacity and large queues are experienced. A graphical representation of LOS is presented in **Figure 6**.

Figure 6: Level of Service (LOS) Categories



Intersection Analysis Methodology

Operational analyses of the intersections were conducted using *Synchro 10* and *SimTraffic* software according to the *Highway Capacity Manual 6th Edition* (*HCM*) methodology and *SimTraffic* microsimulation methodology. Microsimulation allows the user to analyze intersection operations both individually and in context of the entire study network. Additionally, microsimulation gives the user a powerful visualization tool to trace any sources of vehicle delay and queuing as well as the opportunity to perform multiple simulation runs with varying traffic loading within the peak hour to account for the expected variability within a system. This variation also accounts for the various types of drivers (aggressiveness, gap acceptance tolerance) and vehicles (performance on grades,

general acceleration /deceleration). Finally, micro-simulation provides the best means to demonstrate the impacts of queues on nearby intersections.

For intersections, the *HCM* uses control delay, measured in average seconds of delay per vehicle, as the basis for determining LOS. Control delay at an intersection is the average stopped time per vehicle traveling through the intersection plus the movements at slower speeds due to the vehicles moving up in the queue or slowing upstream of the approach. **Table 7** shows the LOS delay thresholds as stated in *HCM*, pages 19-16, 20-6 and 21-9.

Table 7: LOS Thresholds for Intersections (Control Delay)

Level of Service	Signal Control Control Delay Range (sec/veh)	Stop Control Control Delay Range (sec/veh)
A	0 to 10	0 to 10
B	>10 to 20	>10 to 15
C	>20 to 35	>15 to 25
D	>35 to 55	>25 to 35
E	>55 to 80	>35 to 50
F	>80	>50

Roadway Segment Analysis Methodology

Operational analysis along the corridors was conducted using the two-lane highway module of the *Highway Capacity Software* (*HCS*), according to *HCM* methodology. The two-lane highway module within *HCS* was utilized to analyze the operating conditions of the roadway segments within the study area. For two-lane highways, the LOS is defined based on different criteria depending on the classification of the highway. Below is a brief description of each classification type:

- Class I
  - Motorists expect relatively high speeds.
  - Major intercity route, primary connector, commuter routes, etc.
  - Serves mostly long-distance trips.
- Class II
  - Motorists do not expect to sustain high speeds.
  - Access route to Class I facility, scenic/recreational route, or rugged terrain.
  - Serves shorter trips, beginning/ending portions of longer trips, or sightseeing trips.
- Class III
  - Reduced speed limits.
  - Higher number of unsignalized driveways and cross streets.
  - Serves moderately developed areas; local traffic mixes with through traffic.

For Class I highways, the LOS is defined based on average travel speed (ATS) and percent time spent following (PTSF). For Class II highways, the LOS is defined based on PTSF. For Class III highways, the LOS is defined based on percent of free flow speed (PFFS). **Table 8** shows the LOS thresholds for each classification of two-lane highway as stated in the *HCM 6th Edition*, pg 15-8. Note that for this study, only Class I and Class III classifications were used.

Table 8: LOS Thresholds for Two-lane Highways Intersections

Level of Service	Class I		Class II	Class III
	ATS (mi/h)	PTSF (%)	PTSF (%)	PFFS (%)
A	> 55	≤ 35	≤ 40	> 91.7
B	> 50 - 55	> 35 - 50	> 40 - 55	> 83.3 – 91.7
C	> 45 - 50	> 50 - 65	> 55 - 70	> 75.0 – 83.3
D	> 40 - 45	> 65 - 80	> 70 - 85	> 66.7 – 75.0
E	≤ 40	> 80	> 85	≤ 66.7
F	Demand exceeds capacity			

2018 EXISTING CONDITIONS

Using the 2018 Existing volumes, the existing signalized intersections were modeled, and the existing signal timings were optimized using actuated control settings. An AM Peak Hour Factor (PHF) of 0.80 and a PM PHF of 0.86 were utilized. The percentage of heavy vehicles was modeled as 3% for both peak periods. The results of the operational analysis of existing conditions are reported in the following subsections.

2018 Intersection Analysis, Existing Conditions

The results based on *HCM* methodology and *SimTraffic* methodology are summarized in **Tables 9 and 10**. The complete results are provided in **Appendix B – Intersection Operational Analysis Results.** These results demonstrate that all movements at the study intersections operate acceptably under 2018 Existing conditions.

Table 9: Intersection Analysis – 2018 Existing Conditions – *HCM*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Hwy 67 at Siplast Rd.	AM	One-Way Stop	LOS	n/a [1]						A	n/a [2]			n/a [2]	n/a [2]	A
			v/c	n/a [1]						0.0	n/a [2]			n/a [2]	n/a [2]	
			Delay	n/a [1]						7.4	n/a [2]			n/a [2]	n/a [2]	0.0
	PM		LOS	B						A	n/a [2]			n/a [2]	n/a [2]	A
			v/c	0.0						0.0	n/a [2]			n/a [2]	n/a [2]	
			Delay	10.9						7.7	n/a [2]			n/a [2]	n/a [2]	0.2
Hwy 67 at W Walnut St.	AM	One-Way Stop	LOS	B						A	n/a [2]			n/a [2]	n/a [2]	A
			v/c	0.3						0.0	n/a [2]			n/a [2]	n/a [2]	
			Delay	13.7						7.5	n/a [2]			n/a [2]	n/a [2]	4.9
	PM		LOS	C						A	n/a [2]			n/a [2]	n/a [2]	A
			v/c	0.4						0.1	n/a [2]			n/a [2]	n/a [2]	
			Delay	16.0						7.7	n/a [2]			n/a [2]	n/a [2]	4.7
Hwy 67/ Walnut St. at Hwy 67 / 6th St.	AM	One-Way Stop	LOS	n/a [2]	n/a [2]			B					A		n/a [2]	B
			v/c	n/a [2]	n/a [2]			0.1					0.0		n/a [2]	
			Delay	n/a [2]	n/a [2]			11.7					8.0		n/a [2]	11.7
	PM		LOS	n/a [2]	n/a [2]			B					A		n/a [2]	A
			v/c	n/a [2]	n/a [2]			0.2					0.0		n/a [2]	
			Delay	n/a [2]	n/a [2]			13.1					7.7		n/a [2]	1.8
Hwy 67 / 6th St. at Hwy 67 / Caddo St.	AM	Two-Way Stop	LOS	A	n/a [2]	n/a [2]	A	n/a [2]	n/a [2]	C			C			A
			v/c	0.0	n/a [2]	n/a [2]	0.0	n/a [2]	n/a [2]	0.3			0.1			
			Delay	7.8	n/a [2]	n/a [2]	8.0	n/a [2]	n/a [2]	17.3			16.6			4.1
	PM		LOS	A	n/a [2]	n/a [2]	A	n/a [2]	n/a [2]	D			C			A
			v/c	0.0	n/a [2]	n/a [2]	0.0	n/a [2]	n/a [2]	0.6			0.3			
			Delay	7.9	n/a [2]	n/a [2]	8.2	n/a [2]	n/a [2]	33.8			20.1			8.7
Caddo St. at S 3rd St.	AM	One-Way Stop	LOS		n/a [2]	n/a [2]	A	n/a [2]		B						A
			v/c		n/a [2]	n/a [2]	0.0	n/a [2]		0.1						
			Delay		n/a [2]	n/a [2]	7.7	n/a [2]		11.9						1.0
	PM		LOS		n/a [2]	n/a [2]	A	n/a [2]		B						A
			v/c		n/a [2]	n/a [2]	0.0	n/a [2]		0.2						
			Delay		n/a [2]	n/a [2]	8.0	n/a [2]		13.9						1.6
Hwy 67/ Caddo St. at 10th St.	AM	Signal	LOS	B	A	A	C	A	A	A	A	A	A	A	A	B
			v/c	0.3	0.0	0.0	0.6	0.0	0.0	0.1	0.0	0.0	0.4	0.0	0.0	
			Delay	17.4	0.0	0.0	20.3	0.0	0.0	4.0	0.0	0.0	5.8	0.0	0.0	12.1
	PM		LOS	B	A	A	C	A	A	A	A	A	A	A	A	B
			v/c	0.3	0.0	0.0	0.7	0.0	0.0	0.1	0.0	0.0	0.5	0.0	0.0	
			Delay	13.7	0.0	0.0	20.2	0.0	0.0	6.7	0.0	0.0	9.6	0.0	0.0	13.8
10th St. at Pine St.	AM	Signal	LOS	C	A	B	n/a [1]	A	B	A	A	A	A	A	A	B
			v/c	0.3	0.0	0.6	n/a [1]	0.0	0.4	0.1	0.0	0.2	0.4	0.0	0.0	
			Delay	20.9	0.0	19.3	n/a [1]	0.0	18.2	0.1	0.0	0.3	6.2	0.0	0.0	10.2
	PM		LOS	B	A	C	C	A	A	A	A	A	A	A	A	B
			v/c	0.4	0.0	0.7	0.6	0.0	0.0	0.1	0.0	0.2	0.4	0.0	0.0	
			Delay	19.1	0.0	20.7	20.5	0.0	0.0	0.4	0.0	0.5	6.0	0.0	0.0	10.4

[1]No volume modeled making this movement
[2]Free movement
[3]HCM methodology does not calculate LOS due to unconventional configuration

Table 9 (continued): Intersection Analysis – 2018 Existing Conditions – *HCM*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
12th St. at Pine St.	AM	Signal	LOS	n/a [1]	A	B	n/a [1]	A	B	A	A	A	n/a [1]	A	A	B
			v/c	n/a [1]	0.0	0.8	n/a [1]	0.0	0.6	0.2	0.0	0.0	n/a [1]	0.0	0.1	
			Delay	n/a [1]	0.0	16.0	n/a [1]	0.0	13.5	6.5	0.0	0.0	n/a [1]	0.0	5.7	12.3
	PM		LOS	B	A	A	B	A	A	A	A	A	n/a [1]	A	A	B
			v/c	0.6	0.0	0.0	0.7	0.0	0.0	0.1	0.0	0.0	n/a [1]	0.0	0.2	
			Delay	12.3	0.0	0.0	13.3	0.0	0.0	6.5	0.0	0.0	n/a [1]	0.0	7.0	11.6
26th St. at Pine St.	AM	Signal	LOS	A	B	A	A	A	B	B	A	B	B	A	B	B
			v/c	0.1	0.5	0.0	0.1	0.0	0.4	0.2	0.0	0.1	0.3	0.0	0.2	
			Delay	9.0	14.6	9.6	9.4	0.0	13.5	16.0	0.0	15.5	17.6	0.0	16.8	14.7
	PM		LOS	B	B	A	A	A	C	B	A	B	B	A	B	B
			v/c	0.3	0.4	0.0	0.1	0.0	0.7	0.2	0.0	0.1	0.3	0.0	0.3	
			Delay	11.0	13.6	10.0	9.8	0.0	20.6	16.5	0.0	15.7	17.5	0.0	17.3	16.7
Caddo St. at Pine St.	AM	Signal	LOS				C		C		A		A	A		B
			v/c				0.8		0.0		0.2		0.0	0.2		
			Delay				30.9		22.2		9.3		4.8	3.0		10.8
	PM		LOS				C		B		B		A	A		B
			v/c				0.8		0.1		0.3		0.0	0.3		
			Delay				27.4		18.8		11.4		6.8	5.1		12.4
Walnut St. at Pine St.	AM	Signal	LOS	B	B	B	B	B	B	B	A	A	n/a [1]	n/a [1]	n/a [1]	B
			v/c	0.0	0.6	0.6	0.0	0.4	0.4	0.3	0.0	0.0	n/a [1]	n/a [1]	n/a [1]	
			Delay	12.7	15.9	16.0	17.2	12.0	11.9	14.6	0.0	0.0	n/a [1]	n/a [1]	n/a [1]	14.4
	PM		LOS	B	B	B	B	B	n/a [1]	B	A	A	B	A	A	B
			v/c	0.0	0.6	0.6	0.0	0.6	n/a [1]	0.4	0.0	0.0	0.1	0.0	0.0	
			Delay	17.6	16.7	16.9	17.8	14.5	n/a [1]	14.2	0.0	0.0	10.8	0.0	0.0	15.4
Redhill Rd. at Pine St.	AM	One-Way Stop	LOS		n/a [2]	n/a [2]	A	n/a [1]		C		B				A
			v/c		n/a [2]	n/a [2]	0.0	n/a [1]		0.0		0.0				
			Delay		n/a [2]	n/a [2]	9.9	n/a [1]		18.7		11.5				0.1
	PM		LOS		n/a [2]	n/a [2]	A	n/a [1]		C		B				A
			v/c		n/a [2]	n/a [2]	0.0	n/a [1]		0.0		0.0				
			Delay		n/a [2]	n/a [2]	9.7	n/a [1]		19.5		11.3				0.1
Professional Dr. at Pine St.	AM	One-Way Stop	LOS	B	n/a [2]			n/a [2]	n/a [2]				D		B	A
			v/c	0.2	n/a [2]			n/a [2]	n/a [2]				0.1		0.1	
			Delay	10.6	n/a [2]			n/a [2]	n/a [2]				31.7		11.3	1.5
	PM		LOS	B	n/a [2]			n/a [2]	n/a [2]				D		C	A
			v/c	0.1	n/a [2]			n/a [2]	n/a [2]				0.2		0.4	
			Delay	11.3	n/a [2]			n/a [2]	n/a [2]				29.3		17.0	2.3
I-30 NB Off Ramp at Pine St.	AM	One-Way Stop	LOS	A	n/a [2]			n/a [2]	n/a [2]	F		B				A
			v/c	0.1	n/a [2]			n/a [2]	n/a [2]	0.5		0.3				
			Delay	9.3	n/a [2]			n/a [2]	n/a [2]	69.0		14.4				3.8
	PM		LOS	B	n/a [2]			n/a [2]	n/a [2]	F		B				B
			v/c	0.3	n/a [2]			n/a [2]	n/a [2]	1.3		0.2				
			Delay	12.4	n/a [2]			n/a [2]	n/a [2]	320.7		12.2				12.5

[1]No volume modeled making this movement
[2]Free movement
[3]HCM methodology does not calculate LOS due to unconventional configuration

Table 10: Intersection Analysis – 2018 Existing Conditions – *SimTraffic*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Hwy 67 at Siplast Rd.	AM	One-Way Stop	LOS	n/a[1]		n/a[1]				A				A		A
			Delay	n/a[1]		n/a[1]				1.0				2.0		1.3
	PM		LOS	A		A				A				A		A
			Delay	4.3		1.0				0.9				2.2		1.6
Hwy 67 at W Walnut St.	AM	One-Way Stop	LOS	A		A				A	A			A	A	A
			Delay	7.2		2.6				3.7	2.3			2.0	2.2	3.6
	PM		LOS	A		A				A	A			A	A	A
			Delay	7.4		2.4				3.6	2.0			2.3	2.2	3.2
Hwy 67/ Walnut St. at Hwy 67 / 6th St.	AM	One-Way Stop	LOS	A	A			A	A				A		A	A
			Delay	1.1	1.4			7.2	2.5				1.9		1.8	1.8
	PM		LOS	A	A			A	A				A		A	A
			Delay	1.0	0.8			7.4	3.6				2.7		1.7	2.0
Hwy 67 / 6th St. at Hwy 67 / Caddo St.	AM	Two-Way Stop	LOS	A	A	A	A	A	A	A	A	A	A	A	n/a[1]	A
			Delay	4.9	2.4	1.9	4.2	1.4	0.8	7.5	3.5	5.0	6.0	8.6	n/a[1]	3.0
	PM		LOS	A	A	A	A	A	A	B	B	A	A	B	B	A
			Delay	3.3	2.6	1.8	4.4	2.3	1.3	11.0	12.9	8.1	9.5	11.0	14.7	4.6
Caddo St. at S 3rd St.	AM	One-Way Stop	LOS		A	A	A	A		A		A				A
			Delay		1.2	0.8	4.4	1.7		5.6		3.8				1.7
	PM		LOS		A	A	A	A		A		A				A
			Delay		1.2	0.7	2.0	2.5		6.3		4.0				2.3
Hwy 67/ Caddo St. at 10th St.	AM	Signal	LOS	C	C	A	n/a[2]	C	A	n/a[2]	A	A	A	A	A	B
			Delay	23.5	21.9	7.6	n/a[2]	21.7	9.3	n/a[2]	3.5	3.3	6.6	6.3	2.3	10.8
	PM		LOS	C	B	B	C	C	B	B	A	A	A	A	A	B
			Delay	27.8	20.0	13.5	34.3	21.4	11.1	10.1	4.6	3.5	7.1	9.0	6.7	12.4
10th St. at Pine St.	AM	Signal	LOS	C	C	B	n/a[1]	B	A	B	A	A	A	A	A	B
			Delay	29.3	27.9	14.4	n/a[1]	17.5	6.5	11.2	3.1	5.2	7.9	6.7	4.1	11.4
	PM		LOS	C	B	B	B	A	B	A	A	n/a[2]	A	A	A	B
			Delay	32.4	19.7	11.4	14.1	18.4	8.8	12.6	4.0	n/a[2]	6.2	8.5	5.5	11.8
12th St. at Pine St.	AM	Signal	LOS	n/a[1]	B	A	n/a[1]	B	A	B	A	A	n/a[1]	A	A	B
			Delay	n/a[1]	11.8	9.8	n/a[1]	12.8	8.5	13.4	6.6	3.1	n/a[1]	5.3	3.6	10.2
	PM		LOS	B	A	A	B	B	A	A	A	A	n/a[1]	A	A	A
			Delay	12.2	9.4	5.4	18.5	11.4	6.6	1.6	6.4	0.0	n/a[1]	7.5	3.4	9.5
26th St. at Pine St.	AM	Signal	LOS	A	A	A	B	B	A	B	B	A	B	B	A	A
			Delay	5.7	4.7	0.6	12.5	11.4	4.4	15.0	14.8	4.2	16.7	18.0	4.2	8.9
	PM		LOS	B	A	A	B	B	B	B	B	A	B	B	A	B
			Delay	11.0	5.1	0.9	17.1	17.5	13.7	17.3	15.2	4.3	18.1	16.6	4.0	11.8
Caddo St. at Pine St.	AM	Signal	LOS				C		A		A		A	A		A
			Delay				26.4		3.6		0.8		5.0	5.9		6.9
	PM		LOS				C		A		A		B	A		A
			Delay				23.4		3.5		1.5		13.4	8.0		9.6

[1]No Volume modeled making this movement
[2]Low volume modeled making this movement

Table 10 (Continued): Intersection Analysis – 2018 Existing – *SimTraffic*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Walnut St. at Pine St.	AM	Signal	LOS	n/a [2]	B	A	C	B	B	B	n/a [2]	A	n/a [1]	n/a [1]	n/a [1]	B
			Delay	n/a [2]	11.2	8.0	21.9	11.4	10.1	12.7	n/a [2]	4.6	n/a [1]	n/a [1]	n/a [1]	11.0
	PM		LOS	C	B	A	C	B	n/a [1]	A	A	A	A	A	A	B
			Delay	22.3	13.3	9.3	21.1	13.4	n/a [1]	13.8	0.9	9.9	6.1	0.8	7.1	12.8
Redhill Rd. at Pine St.	AM	One-Way Stop	LOS		A	A	A	A		C		A				A
			Delay		0.2	0.0	8.4	3.7		17.5		0.0				1.9
	PM		LOS		A	A	A	A		C		A				A
			Delay		0.2	0.0	4.6	4.7		24.2		0.0				2.7
Professional Dr. at Pine St.	AM	One-Way Stop	LOS	A	A			A	A				C		A	A
			Delay	6.6	1.0			0.8	0.2				17.6		6.6	1.7
	PM		LOS	A	A			A	A				E		B	A
			Delay	9.5	0.8			1.0	0.3				41.7		12.0	2.9
I-30 NB Off Ramp at Pine St.	AM	One-Way Stop	LOS	A	A			A	A	C	n/a [2]	A				A
			Delay	4.7	0.8			1.4	1.6	19.9	n/a [2]	1.5				1.9
	PM		LOS	A	A			A	A	F	n/a [1]	A				A
			Delay	9.6	0.7			2.0	1.7	68.0	n/a [1]	1.6				4.2

2018 Roadway Segment Analysis, Existing Conditions

Where applicable, the roadway segments within the study area were analyzed using the *HCS* two-lane highway module. To the north of Walnut Street, Highway 67 crosses through Arkadelphia's Central Business District (CBD) and does not function as a highway. The number of access points per mile exceeds the range for a two-lane highway, and the base free flow speed (BFFS) is below the range for a two-lane highway according to the *HCM* methodology. Due to the close spacing of intersections and nature of operations along the roadway segments to the north of Walnut Street, these segments were not analyzed separately from the intersection analysis.

To the south of Walnut Street, two segments along Highway 67 were identified as functioning like a two-lane highway and were delineated according to typical section and speed limit as follows:

- Segment 1-Highway 67, from south of Siplast Road to north of Siplast Road (where the speed limit drops from 50 mph to 45 mph). This segment was identified as a Class I Two-Lane Highway and has an access point density of 8 points per mile.
- Segment 2- Highway 67, from north of Siplast Road to south of Walnut Street (where the speed limit drops from 45 mph to 40 mph). This segment was identified as a Class III Two-Lane Highway and has an access point density of 40 points per mile.

Based on the volume data, a peak hour factor of 0.82 was utilized for the AM peak and a peak hour factor of 0.86 was utilized for the PM peak. The percentage of heavy vehicles was 5% for the AM peak and 4% for the PM peak. Level terrain was assumed for both segments. The base free flow speed was estimated to be 50 mph based on the posted speed limit plus 10 mph according to *HCM* methodology.

The results of this analysis are shown in **Table 11** below. The complete results from this analysis are provided in **Appendix C - Roadway Segment Operational Analysis Results**. These results demonstrate that the corridor currently operates at acceptable LOS throughout the study area. However, the portion of Highway 67 from south of Siplast Road to north of Siplast Road operates at only marginally acceptable LOS D in both directions during one or both of the peak periods.

Table 11: Roadway Segment Analysis – 2018 Existing Conditions – *HCM*

Segment	Direction	Two-Lane Hwy Class	AM					PM				
			LOS	ATS (mph	PTS F (%)	PFF S (%)	v/c	LOS	ATS (mph	PTS F (%)	PFF S (%)	v/c
Hwy 67- South of Siplast Rd. to North of Siplast Rd.	NB	Class I	C	45.1	48.0	93.9	0.14	D	43.9	36.3	91.4	0.1
Hwy 67 - North of Siplast Rd. to South of Walnut St.		Class III	B	29.8	59.2	85.1	0.14	C	28.0	50.0	79.9	0.11
Hwy 67 - South of Walnut St. to North of Siplast Rd.	SB	Class III	B	30.2	25.9	86.2	0.06	B	29.7	51.3	84.8	0.12
Hwy 67 - North of Siplast Rd. to South of Siplast Rd.		Class I	D	43.9	21.0	91.6	0.05	D	44.0	44.7	91.7	0.12

2040 FUTURE NO ACTION CONDITIONS

For the 2040 No Action Conditions, no improvements were assumed. The intersections and the highway segments were analyzed using the same methodologies and assumptions as were used for the 2018 Existing conditions. Only the volumes changed between the 2018 Existing and the 2040 No Action conditions. The results are described in the following subsections.

2040 Intersection Analysis, No Action Conditions

The results from the 2040 No Action intersection analysis are shown in **Tables 12 and 13**. The complete results are provided in **Appendix B - Intersection Operational Analysis Results.** This analysis showed that most movements at the study intersections operate acceptable under 2040 No Action conditions.

Table 12: Intersection Analysis – 2040 No Action Conditions – *HCM*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Hwy 67 at Siplast Rd.	AM	One-Way Stop	LOS	n/a[1]						A	n/a[2]			n/a[2]	n/a[2]	A
			v/c	n/a[1]						0.0	n/a[2]			n/a[2]	n/a[2]	
			Delay	n/a[1]						7.5	n/a[2]			n/a[2]	n/a[2]	0.0
	PM		LOS	B						A	n/a[2]			n/a[2]	n/a[2]	A
			v/c	0.0						0.0	n/a[2]			n/a[2]	n/a[2]	
			Delay	11.6						7.8	n/a[2]			n/a[2]	n/a[2]	0.2
Hwy 67 at W Walnut St.	AM	One-Way Stop	LOS	C						A	n/a[2]			n/a[2]	n/a[2]	A
			v/c	0.4						0.0	n/a[2]			n/a[2]	n/a[2]	
			Delay	16.2						7.5	n/a[2]			n/a[2]	n/a[2]	5.7
	PM		LOS	C						A	n/a[2]			n/a[2]	n/a[2]	A
			v/c	0.5						0.1	n/a[2]			n/a[2]	n/a[2]	
			Delay	21.1						7.8	n/a[2]			n/a[2]	n/a[2]	5.9
Hwy 67/ Walnut St. at Hwy 67 / 6th St.	AM	One-Way Stop	LOS	n/a[2]	n/a[2]			B					A		n/a[2]	B
			v/c	n/a[2]	n/a[2]			0.1					0.0		n/a[2]	
			Delay	n/a[2]	n/a[2]			12.7					8.0		n/a[2]	11.7
	PM		LOS	n/a[2]	n/a[2]			B					A		n/a[2]	A
			v/c	n/a[2]	n/a[2]			0.2					0.0		n/a[2]	
			Delay	n/a[2]	n/a[2]			14.9					7.9		n/a[2]	1.8
Hwy 67 / 6th St. at Hwy 67 / Caddo St.	AM	Two-Way Stop	LOS	A	n/a[2]	n/a[2]	A	n/a[2]	n/a[2]	C			C			A
			v/c	0.0	n/a[2]	n/a[2]	0.1	n/a[2]	n/a[2]		0.4			0.1		
			Delay	7.9	n/a[2]	n/a[2]	8.2	n/a[2]	n/a[2]	22.8			20.0			5.1
	PM		LOS	A	n/a[2]	n/a[2]	A	n/a[2]	n/a[2]	F			D			C
			v/c	0.0	n/a[2]	n/a[2]	0.0	n/a[2]	n/a[2]		1.0			0.4		
			Delay	8.1	n/a[2]	n/a[2]	8.4	n/a[2]	n/a[2]	96.1			27.4			21.7
Caddo St. at S 3rd St.	AM	One-Way Stop	LOS		n/a[2]	n/a[2]	A	n/a[2]		B						A
			v/c		n/a[2]	n/a[2]	0.0	n/a[2]		0.1						
			Delay		n/a[2]	n/a[2]	7.8	n/a[2]		13.0						1.1
	PM		LOS		n/a[2]	n/a[2]	A	n/a[2]		C						A
			v/c		n/a[2]	n/a[2]	0.0	n/a[2]		0.2						
			Delay		n/a[2]	n/a[2]	8.2	n/a[2]		16.2						1.9
Hwy 67/ Caddo St. at 10th St.	AM	Signal	LOS	B	A	A	B	A	A	A	A	A	A	A	A	A
			v/c	0.3	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	
			Delay	16.0	0.0	0.0	19.6	0.0	0.0	4.8	0.0	0.0	1.5	0.0	0.0	9.7
	PM		LOS	B	A	A	C	A	A	A	A	A	A	A	A	B
			v/c	0.3	0.0	0.0	0.8	0.0	0.0	0.2	0.0	0.0	0.6	0.0	0.0	
			Delay	12.5	0.0	0.0	22.1	0.0	0.0	8.0	0.0	0.0	5.9	0.0	0.0	13.2
10th St. at Pine St.	AM	Signal	LOS	C	A	C	n/a[1]	A	B	A	A	A	A	A	A	B
			v/c	0.4	0.0	0.6	n/a[1]	0.0	0.4	0.7	0.0	0.2	0.5	0.0	0.0	
			Delay	20.4	0.0	18.3	n/a[1]	0.0	17.2	0.2	0.0	0.4	8.1	0.0	0.0	10.7
	PM		LOS	B	A	B	B	A	A	A	A	A	A	A	A	B
			v/c	0.4	0.0	0.7	0.6	0.0	0.0	0.2	0.0	0.3	0.5	0.0	0.0	
			Delay	18.5	0.0	19.0	19.3	0.0	0.0	0.7	0.0	0.8	8.2	0.0	0.0	10.7

[1]No volume modeled making this movement
[2]Free movement
[3]HCM methodology does not calculate LOS due to unconventional configuration

Table 12 (Continued): Intersection Analysis – 2040 No Action Conditions – *HCM*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
12th St. at Pine St.	AM	Signal	LOS	n/a [1]	A	B	n/a [1]	A	B	A	A	A	n/a [1]	A	A	B
			v/c	n/a [1]	0.0	0.8	n/a [1]	0.0	0.6	0.3	0.0	0.0	n/a [1]	0.0	0.1	
			Delay	n/a [1]	0.0	15.8	n/a [1]	0.0	12.8	8.0	0.0	0.0	n/a [1]	0.0	6.8	12.4
	PM		LOS	B	A	A	B	A	A	A	A	A	n/a [1]	A	A	B
			v/c	0.6	0.0	0.0	0.7	0.0	0.0	0.1	0.0	0.0	n/a [1]	0.0	0.2	
			Delay	12.5	0.0	0.0	13.9	0.0	0.0	7.7	0.0	0.0	n/a [1]	0.0	8.4	12.2
26th St. at Pine St.	AM	Signal	LOS	A	B	A	A	A	B	C	A	B	F	A	B	C
			v/c	0.1	0.6	0.0	0.1	0.0	0.5	0.4	0.0	0.1	1.0	0.0	0.3	
			Delay	9.4	16.7	9.8	10.0	0.0	15.0	22.2	0.0	15.7	88.3	0.0	17.3	26.3
	PM		LOS	B	B	B	A	C	A	C	A	B	F	A	B	C
			v/c	0.4	0.5	0.1	0.1	0.8		0.5		0.1	1.1		0.3	
			Delay	12.8	15.0	10.2	10.0	28.3		25.6		16.0	103.7		18.1	30.4
Caddo St. at Pine St.	AM	Signal	LOS				C		C		B		A	A		B
			v/c				0.8		0.0		0.4		0.0	0.2		
			Delay				29.7		21.0		10.6		6.0	3.6		11.4
	PM		LOS				C		B		B		A	A		B
			v/c				0.9		0.1		0.3		0.0	0.3		
			Delay				26.5		17.1		13.1		8.7	6.4		13.3
Walnut St. at Pine St.	AM	Signal	LOS	B	B	B	B	B	B	B	A	A	n/a [1]	n/a [1]	n/a [1]	B
			v/c	0.0	0.7	0.7	0.0	0.4	0.4	0.4	0.0	0.0	n/a [1]	n/a [1]	n/a [1]	
			Delay	12.1	16.2	16.4	17.8	11.2	11.1	17.5	0.0	0.0	n/a [1]	n/a [1]	n/a [1]	14.8
	PM		LOS	B	B	B	B	B	n/a [1]	B	A	A	B	A	A	B
			v/c	0.0	0.7	0.7	0.0	0.7	n/a [1]	0.5	0.0	0.0	0.7	0.0	0.0	
			Delay	19.0	18.1	18.3	19.1	15.1	n/a [1]	16.5	0.0	0.0	11.6	0.0	0.0	16.6
Redhill Rd. at Pine St.	AM	One-Way Stop	LOS		n/a [2]	n/a [2]	B	n/a [2]		C		B				A
			v/c		n/a [2]	n/a [2]	0.0	n/a [2]		0.0		0.0				
			Delay		n/a [2]	n/a [2]	10.7	n/a [2]		22.3		12.5				0.2
	PM		LOS		n/a [2]	n/a [2]	B	n/a [2]		C		B				A
			v/c		n/a [2]	n/a [2]	0.0	n/a [2]		0.0		0.0				
			Delay		n/a [2]	n/a [2]	10.4	n/a [2]		23.3		12.2				0.2
Professional Dr. at Pine St.	AM	One-Way Stop	LOS	B	n/a [2]			n/a [2]	n/a [2]				F		B	A
			v/c	0.3	n/a [2]			n/a [2]	n/a [2]				0.2		0.1	
			Delay	12.1	n/a [2]			n/a [2]	n/a [2]				58.3		12.3	2.0
	PM		LOS	B	n/a [2]			n/a [2]	n/a [2]				E		C	A
			v/c	0.2	n/a [2]			n/a [2]	n/a [2]				0.3		0.5	
			Delay	13.2	n/a [2]			n/a [2]	n/a [2]				44.0		23.4	3.1
I-30 NB Off Ramp at Pine St.	AM	One-Way Stop	LOS	B	n/a [2]			n/a [2]	n/a [2]	F		C				A
			v/c	0.2	n/a [2]			n/a [2]	n/a [2]	1.0		0.4				
			Delay	10.0	n/a [2]			n/a [2]	n/a [2]	209.3		17.6				8.2
	PM		LOS	C	n/a [2]			n/a [2]	n/a [2]	F		B				E
			v/c	0.4	n/a [2]			n/a [2]	n/a [2]	2.9		0.2				
			Delay	15.4	n/a [2]			n/a [2]	n/a [2]	1119.1		13.7				39.8

[1]No volume modeled making this movement
[2]Free movement
[3]HCM methodology does not calculate LOS due to unconventional configuration

Table 13: Intersection Analysis – 2040 No Action Conditions – *SimTraffic*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Hwy 67 at Siplast Rd.	AM	One-Way Stop	LOS	n/a [1]		n/a [1]				A				A		A
			Delay	n/a [1]		n/a [1]				2.9				3.4		1.9
	PM		LOS	A		A				A				A		A
			Delay	7.7		1.0				1.1				3.0		2.1
Hwy 67 at W Walnut St.	AM	One-Way Stop	LOS	A		A				A	A			A	A	A
			Delay	9.1		4.5				3.7	3.1			1.9	1.9	4.6
	PM		LOS	A		A				A	A			A	A	A
			Delay	7.3		2.3				4.9	3.3			2.8	2.6	3.8
Hwy 67/ Walnut St. at Hwy 67 / 6th St.	AM	One-Way Stop	LOS	A	A			A	A				A		A	A
			Delay	1.2	1.8			7.4	2.4				0.9		1.2	1.6
	PM		LOS	A	A			A	A				A		A	A
			Delay	1.0	1.1			9.0	5.1				1.9		2.0	2.5
Hwy 67 / 6th St. at Hwy 67 / Caddo St.	AM	Two-Way Stop	LOS	A	A	A	A	A	A	B	A	A	A	A	n/a [1]	A
			Delay	4.2	2.3	1.7	4.2	2.3	2.7	10.3	3.1	7.6	6.6	8.4	n/a [1]	3.1
	PM		LOS	A	A	A	A	A	A	B	C	A	A	B	A	A
			Delay	4.5	2.9	2.0	5.2	2.2	1.7	14.1	17.2	8.7	8.1	12.6	7.0	5.6
Caddo St. at S 3rd St.	AM	One-Way Stop	LOS		A	A	A	A		A		A				A
			Delay		1.0	0.3	5.0	2.9		5.3		2.8				2.3
	PM		LOS		A	A	A	A		A		A				A
			Delay		1.5	1.3	2.9	2.4		7.4		4.6				2.4
Hwy 67/ Caddo St. at 10th St.	AM	Signal	LOS	B	B	A	n/a [2]	C	B	A	A	A	A	A	A	B
			Delay	12.3	17.2	3.9	n/a [2]	22.7	12.0	2.5	2.9	2.0	7.2	7.2	4.0	11.1
	PM		LOS	D	C	C	A	C	B	A	A	A	B	B	A	B
			Delay	47.0	33.4	32.8	9.9	21.8	15.6	5.3	5.7	3.7	10.5	10.7	7.7	16.6
10th St. at Pine St.	AM	Signal	LOS	C	B	B	n/a [1]	B	A	B	A	A	B	A	A	B
			Delay	21.8	19.8	12.4	n/a [1]	15.9	5.1	11.5	4.8	4.3	17.4	8.0	5.8	10.5
	PM		LOS	C	C	B	A	B	A	C	A	A	A	A	A	B
			Delay	25.8	22.6	12.2	7.5	15.1	7.9	20.2	5.3	2.7	10.0	9.9	7.0	12.8
12th St. at Pine St.	AM	Signal	LOS	n/a [1]	B	A	n/a [1]	B	A	n/a [2]	A	A	n/a [1]	A	A	A
			Delay	n/a [1]	11.2	9.3	n/a [1]	10.2	6.7	n/a [2]	7.4	5.0	n/a [1]	6.7	3.5	9.5
	PM		LOS	B	B	B	n/a [2]	B	B	A	A	A	n/a [1]	A	A	B
			Delay	19.1	12.0	10.4	n/a [2]	11.5	11.4	5.8	5.8	4.3	n/a [1]	8.9	3.3	10.6
26th St. at Pine St.	AM	Signal	LOS	B	A	A	B	B	A	B	B	A	C	B	A	B
			Delay	13.2	8.2	2.3	18.2	13.0	8.8	11.8	11.5	5.0	20.1	18.6	3.7	10.9
	PM		LOS	B	A	A	C	C	B	B	B	A	C	B	A	B
			Delay	13.7	8.7	1.9	24.5	20.9	16.8	18.9	15.5	4.4	21.6	19.4	4.7	14.8
Caddo St. at Pine St.	AM	Signal	LOS				C		A		A		B	A		A
			Delay				26.8		6.6		0.8		13.5	6.5		7.8
	PM		LOS				C		A		A		B	A		A
			Delay				20.6		4.2		1.2		12.8	8.1		8.6

[1]No Volume modeled making this movement
[2]Low volume modeled making this movement

Table 13 (Continued): Intersection Analysis – 2040 No Action – *SimTraffic*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Walnut St. at Pine St.	AM	Signal	LOS	n/a [2]	B	A	C	A	A	B	A	B	n/a [1]	n/a [1]	n/a [1]	B
			Delay	n/a [2]	11.6	9.3	26.4	7.8	2.8	15.3	9.0	10.8	n/a [1]	n/a [1]	n/a [1]	10.6
	PM		LOS	D	B	B	C	B	n/a [1]	B	B	A	B	A	A	B
			Delay	40.2	11.7	10.7	29.9	10.7	n/a [1]	14.7	14.9	9.7	15.6	2.1	5.0	11.6
Redhill Rd. at Pine St.	AM	One-Way Stop	LOS		A	A	A	A		C		A				A
			Delay		0.2	0.0	7.4	3.0		22.4		0.0				1.5
	PM		LOS		A	A	A	A		B		A				A
			Delay		0.1	0.0	5.8	4.2		12.0		0.3				2.4
Professional Dr. at Pine St.	AM	One-Way Stop	LOS	A	A			A	A				F		A	A
			Delay	9.4	1.6			0.8	0.2				56.7		7.5	2.6
	PM		LOS	B	A			A	A				F		C	A
			Delay	13.9	1.3			1.1	0.3				68.2		22.6	4.5
I-30 NB Off Ramp at Pine St.	AM	One-Way Stop	LOS	A	A			A	A	F	F	A				A
			Delay	9.8	0.9			1.5	1.7	59.2	109.0	3.0				3.8
	PM		LOS	C	A			A	A	F	n/a [1]	F				C
			Delay	21.3	0.9			2.4	1.6	390	n/a [1]	134.0				23.5

[1]No Volume modeled making this movement
[2]Low volume modeled making this movement

2040 Roadway Segment Analysis, No Action Conditions

The results from the *HCS* analysis of the Highway 67 roadway segments which operate as a two-lane highway are shown in **Table 14**. For this analysis, all assumptions and inputs remained the same as the 2018 Existing conditions except the volumes were updated to reflect the anticipated growth for 2040. Complete results of this analysis are provided in **Appendix C - Roadway Segment Operational Analysis Results**. Based on this analysis, the performance along these portions of Highway 67 will continue to perform adequately during both peak periods in 2040. However, the southernmost segment of Highway 67 from south of Siplast Road to north of Siplast Road will operate at marginally acceptable LOS D conditions for both directions of travel during both peak periods.

Table 14: Roadway Segment Analysis – 2040 No Action Conditions – *HCM*

Segment	Direction	Two-Lane Hwy Class	AM					PM				
			LOS	ATS (mph	PTS F (%)	PFF S (%)	v/c	LOS	ATS (mph	PTS F (%)	PFF S (%)	v/c
Hwy 67- South of Siplast Rd. to North of Siplast Rd.	NB	Class I	D	44.4	52.1	92.5	0.17	D	43.4	40.3	90.3	0.11
Hwy 67 - North of Siplast Rd. to South of Walnut St.		Class III	C	29.1	63.7	83.3	0.17	C	27.6	53.9	79.0	0.13
Hwy 67 - South of Walnut St. to North of Siplast Rd.	SB	Class III	B	30.0	26.6	85.7	0.07	C	29.1	54.7	83.1	0.14
Hwy 67 - North of Siplast Rd. to South of Siplast Rd.		Class I	D	43.5	24.1	90.7	0.07	D	43.1	48.8	89.9	0.14

SAFETY ANALYSIS

In order to evaluate safety performance, the historical crashes occurring within the study area were collected for the three most recent complete years of available data (2015-2017). Generally, crash patterns on this corridor are typical of State highways in Arkansas: in urban areas, where traffic volumes are high, the frequency of rear-end and angle accidents tends to increase due to proliferation of access points. In rural areas, there is a higher incidence of single-vehicle (run-off-road) crashes.

KA Crashes are defined as either fatal or serious injury crashes.

Crash rates for total crashes and KA crashes were calculated for contiguous segments with similar geometric, developmental, and other characteristics along 4 separate segments of Hwy. 51 and Hwy. 67 and compared to the statewide averages for similar facilities. Crash rates were calculated as follows:

$$\textbf{Crash Rate (R)} = (C * 10^6)/(V*365*N*L)$$

- R = Roadway crash rate expressed as crashes per Million Vehicle-Miles (MVM) of travel
  - KA crash rate is expressed as crashes per 100 MVM of travel, thus ($C*10^8$)
- C = Total number of roadway crashes in the study period
- V = Traffic volumes using Average Annual Daily Traffic volumes
- N = Number of years of data
- L = Length of the roadway segment in miles

Table 15 shows the three-year average crash rates compared to statewide averages. The average crash rates on Highway 51 are above the statewide average for similar facilities. However, The KA crash rate was lower than the statewide average along the entire project corridor. The average crash rate on Highway 67 is also higher than the statewide average for similar facilities.

Table 15: Annual Average Crash Rates (2015 – 2017)

Route	Log Miles	Weighted ADT [1]	Segment Length	All Crashes			KA Crashes		
				Number of Crashes	Crash Rate (per 100 MVM) [4]	Statewide Average (per 100 MVM) [4]	Number of Crashes	Crash Rate (per 100 MVM) [5]	Statewide Average (per 100 MVM) [5]
Highway 51 (Walnut Street to 26th Street)	29.06 to 29.99	13,000	0.93	60	4.53	3.98 [3]	2	0.15	7.88
Highway 51 (26th Street to Robey)	30.00 to 31.27	9,000	1.27	47	3.76	2.48 [2]	0	0	9.55
Highway 67 (Siplast Road to Pine Street)	14.415 to 15.795	6,700	1.38	27	2.67	2.48 [2]	0	0	9.55
Highway 51 (1st Street to 5th Street)	0.00 to 0.51	3,400	0.51	8	4.21	2.48 [2]	0	0	9.55

1 - Average daily traffic
2 - Statewide average crash rate for two-lane undivided highways, no control of access
3 - Statewide average crash rate for four-lane undivided highways, no control of access
4 - Crash rates reported in crashes per million vehicle miles (MVM)
5 - KA crash rates reported in crashes per 100 million vehicle miles (MVM)

Figure 7 illustrates locations with a high crash frequency. Crashes occurred more frequently along Highway 51 from Walnut Street to Robey Street, which are the most congested intersections on the corridor with frequent stop-and-go conditions. When considering fatal (K) and serious injury (A) crashes, as shown in **Figure 8**, the highest concentration is located between Walnut Street and 26th Street – as only 2 KA crashes occur within these project limits over the 3 year time period. A closer examination revealed these 2 KA crashes occurred due to a northbound vehicle attempting to turn left at Mercy Way in the inside through lane (because a turn bay wasn't present) and getting rear-ended by another vehicle.

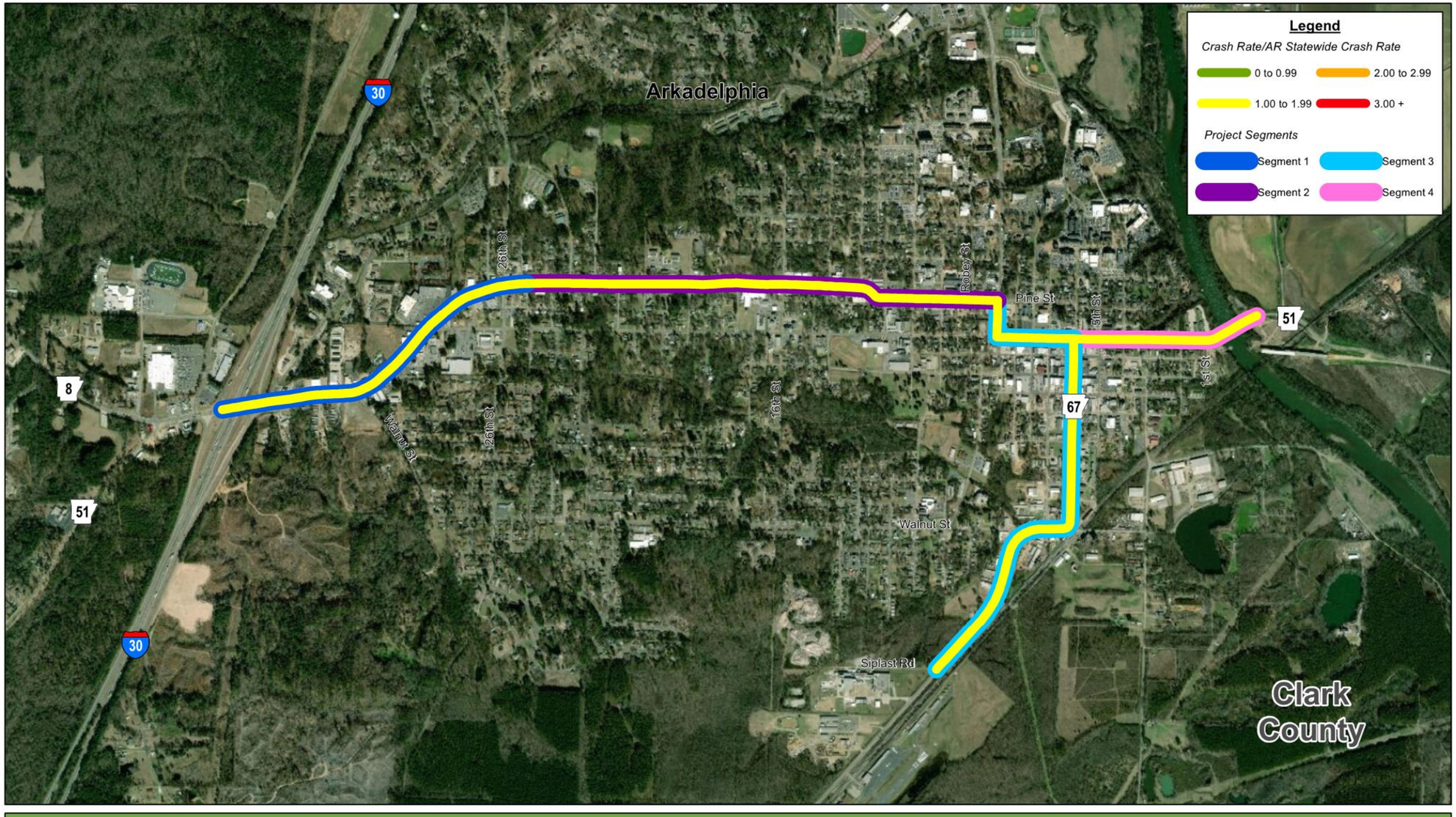
The safety analysis also revealed a relatively high number of crashes at the unsignalized intersections of Highway 51 between the I-30 northbound ramp and Professional Park

The safety analysis also revealed a relatively high number of crashes at the unsignalized intersections of Highway 51 between the I-30 northbound ramp and Professional Park Drive. Eastbound cars turning left are not protected resulting in angle crashes. Several rear-end crashes occur here potentially due to a westbound following driver incorrectly assuming that the drivers will be accelerating onto the interstate ramp.

At the signalized intersection at Pine Street and Walnut Street, a pattern of angle crashes occur, which could be due to the roadway curve through the intersection.

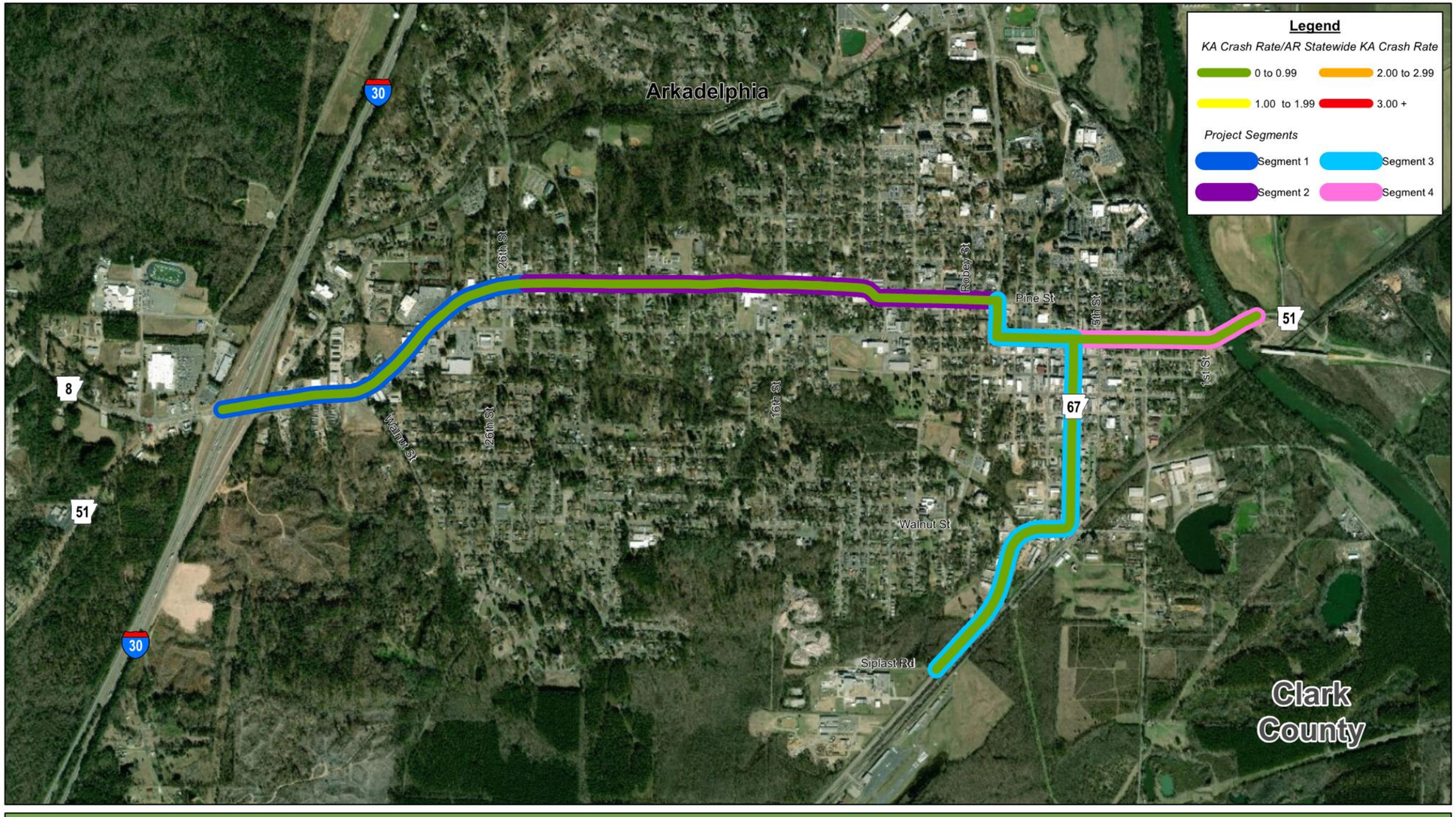
The roadway configuration at Pine Street and Caddo Street, coupled with the lack on signage, could play a role in the number of crashes occurring near this intersection. Vehicles eastbound on Street have the opportunity to turn right onto Caddo Street, approximately 150 feet upstream of the signal. There is no physical barrier preventing westbound vehicles using from turn left at this location. The confusion of this configuration may add to the number of angle crashes occurring here.

Figure 7: Highway 51 and Highway 67 Safety Review (All Crashes)



Arkadelphia Bypass - Crash Rates (All Severity) Map
Arkadelphia
Clark County

Figure 8: Highway 51 and Highway 67 Safety Review (KA Crashes)



Arkadelphia Bypass - Crash Rates (KA Severity) Map
Arkadelphia
Clark County

ALTERNATIVES

Based on an evaluation of the existing conditions as well as future transportation needs, various bypass corridors have been identified. The proposed bypass alignment generally intersects Highway 51 near the I-30 interchange, passes south of Arkadelphia, intersects Highway 67 and continues east, intersecting with Highway 51 on the east side of Arkadelphia. A modified bypass option that intersects I-30 at a new interchange south of the I-30 interchange at Highway 51 was also considered as part of the report. This alternative removes all bypass traffic from the intersections on Highway 51 / Pine Street. To evaluate the impacts of a future bypass, the study area was separated into western improvement alternatives and eastern improvement alternatives. For each alternative analysis, it was assumed the full bypass would be constructed by 2040.

2040 ALTERNATIVES VOLUMES

To develop 2040 Alternative Volumes, the 2018 Existing Volumes were redistributed based on the Projected Bypass Volumes for Alternative 3 and Alternative 7 from the previous study. On Walnut Street near the Pine Street intersection, the previous study showed the bypass would carry an average daily traffic (ADT) volume of 5,200 in 2013. Along the bypass south of Arkadelphia, the report showed an ADT of 1,300 in 2013. These ADTs were projected to 2018 and AM and PM peak hour volumes were developed, assuming approximately 9.5% and 10.5% of the ADT respectively. The traffic volume expected to use the proposed bypass were removed from the traffic volumes currently using Highway 51 through the city.

Like the 2040 No Action volumes, 2040 Alternative volumes were projected from the 2018 redistributed volumes using the exponential growth rate of 0.80%. Future traffic volumes for western improvement alternative are shown in **Figures 9** through **Figure 13**.

Additional development will likely occur within this portion of study area but should not significantly increase the traffic volumes on the existing and proposed roadway network. Future volumes for the eastern improvement alternatives are shown in **Figure 14** and **Figure 15.** Due to very similar alignments, future volumes at key intersections for Bypass Alignment E and Bypass Alignment F are shown on Figure 14.

Figure 9: 2040 Western Portion - Alternative 1 Volumes

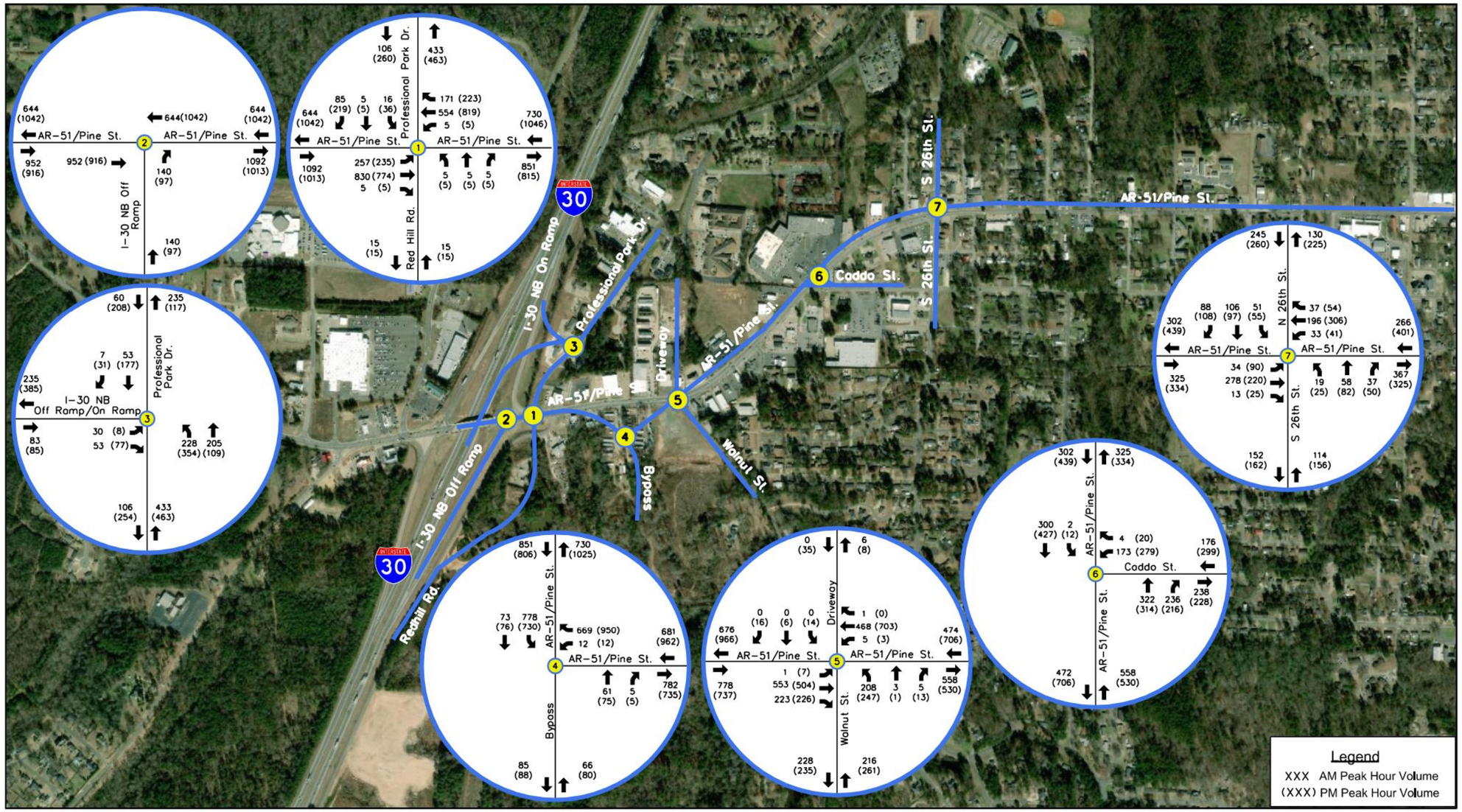


Figure 10: 2040 Western Portion - Alternative 2 Volumes

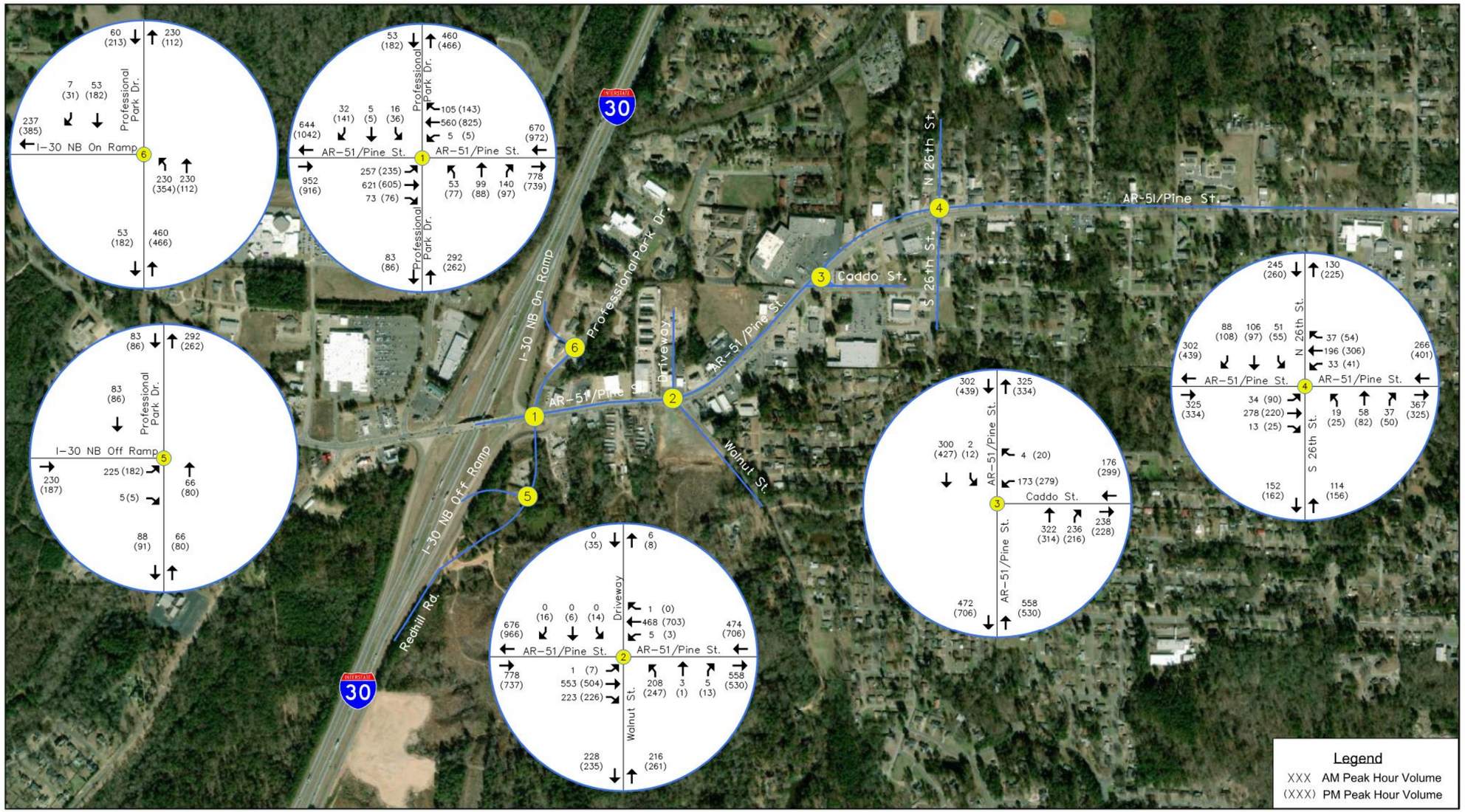


Figure 11: 2040 Western Portion - Alternative 3 Volumes

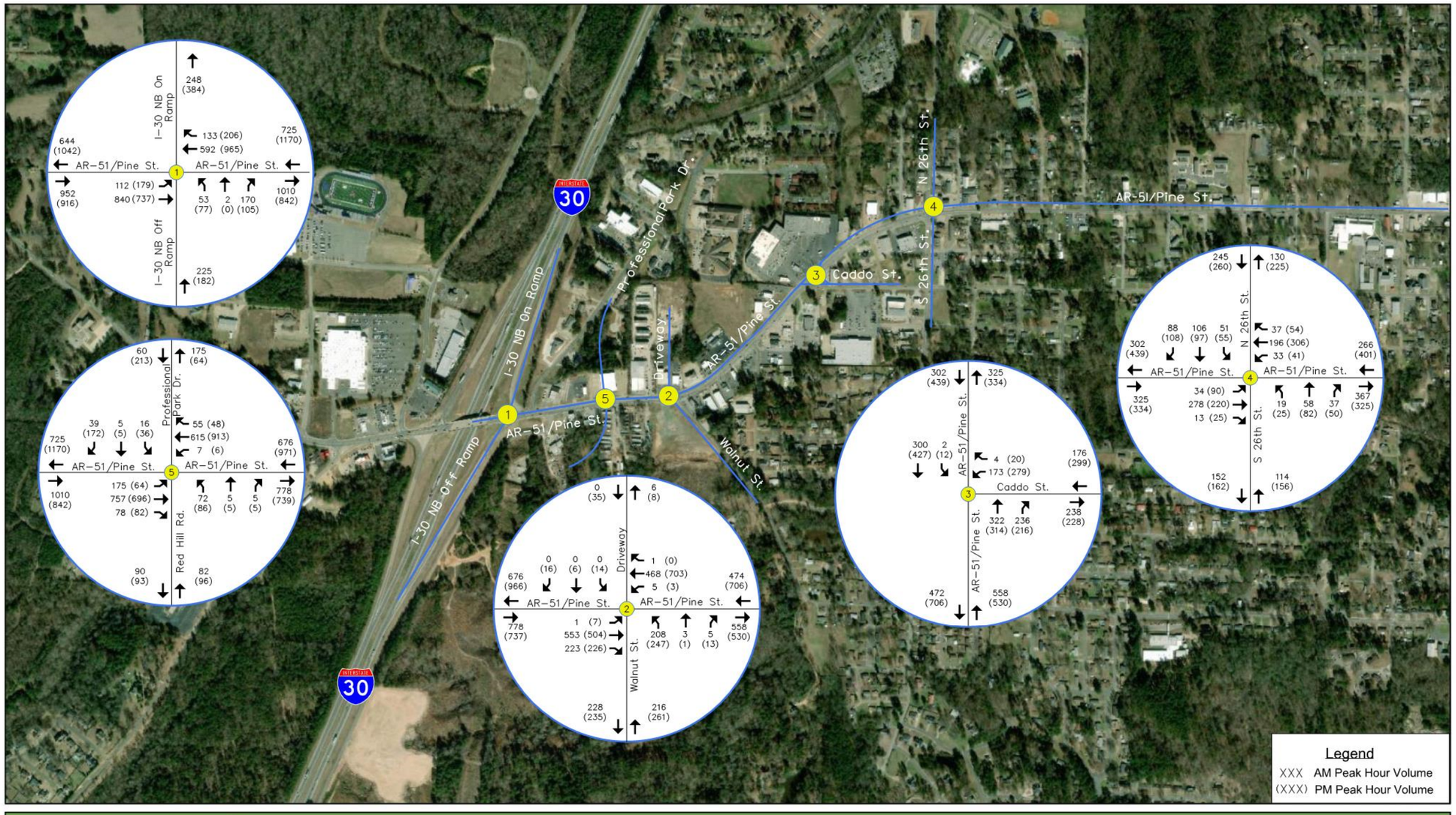


Figure 12: 2040 Western Portion - Alternative 4 Volumes

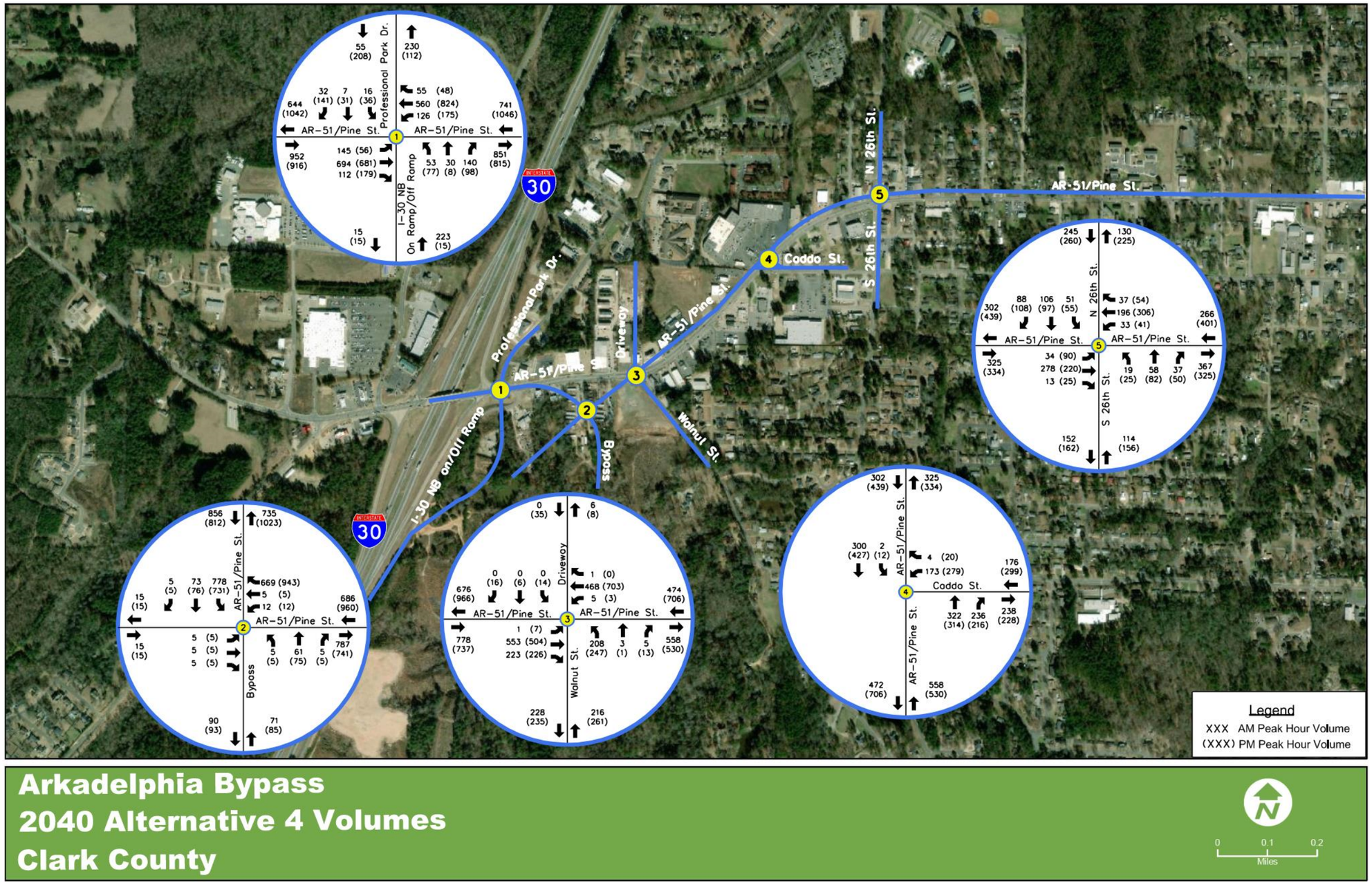


Figure 13: 2040 Western Portion – New Interchange

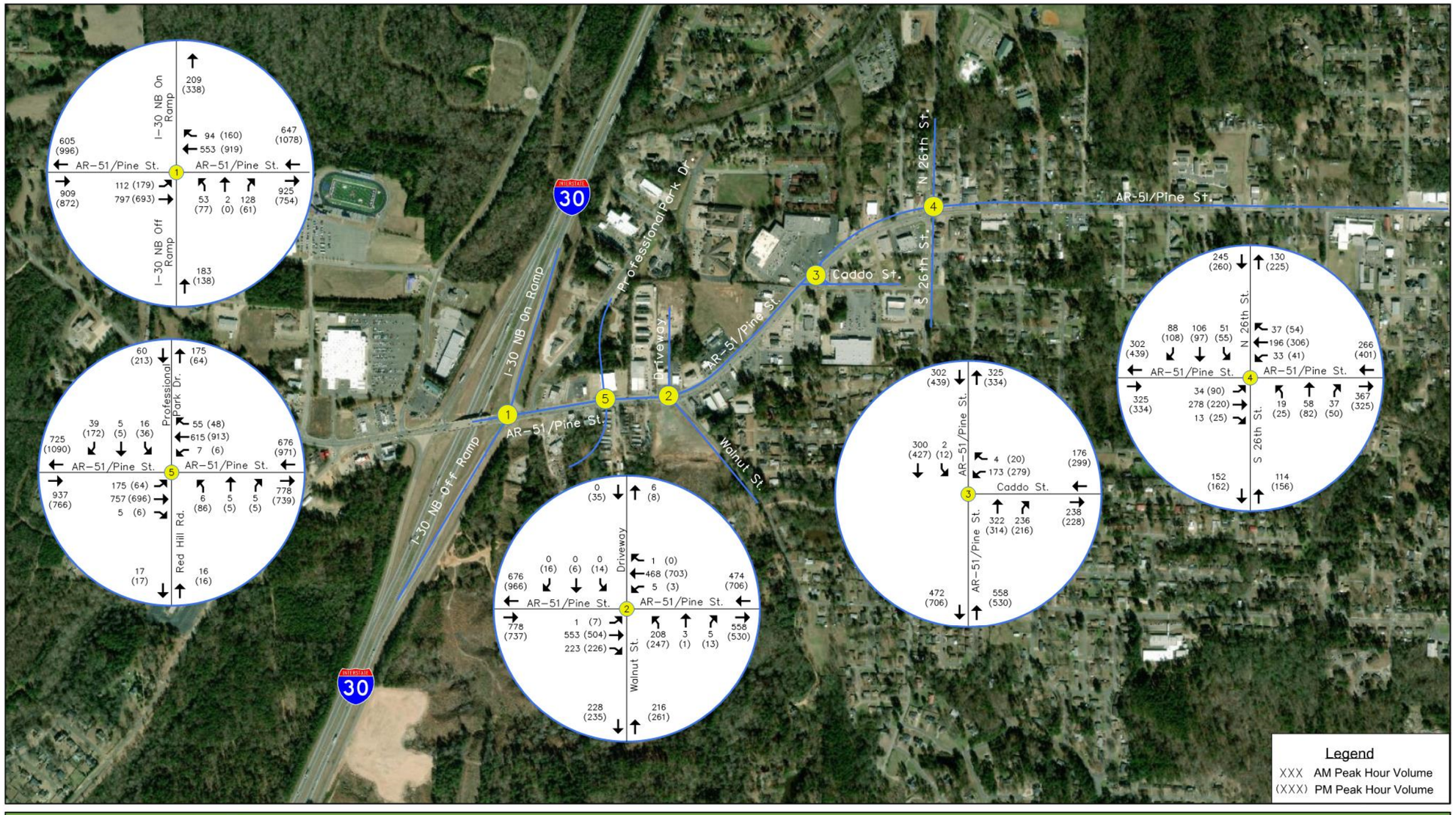


Figure 14: 2040 Eastern Portion - Alternative E and F Volumes

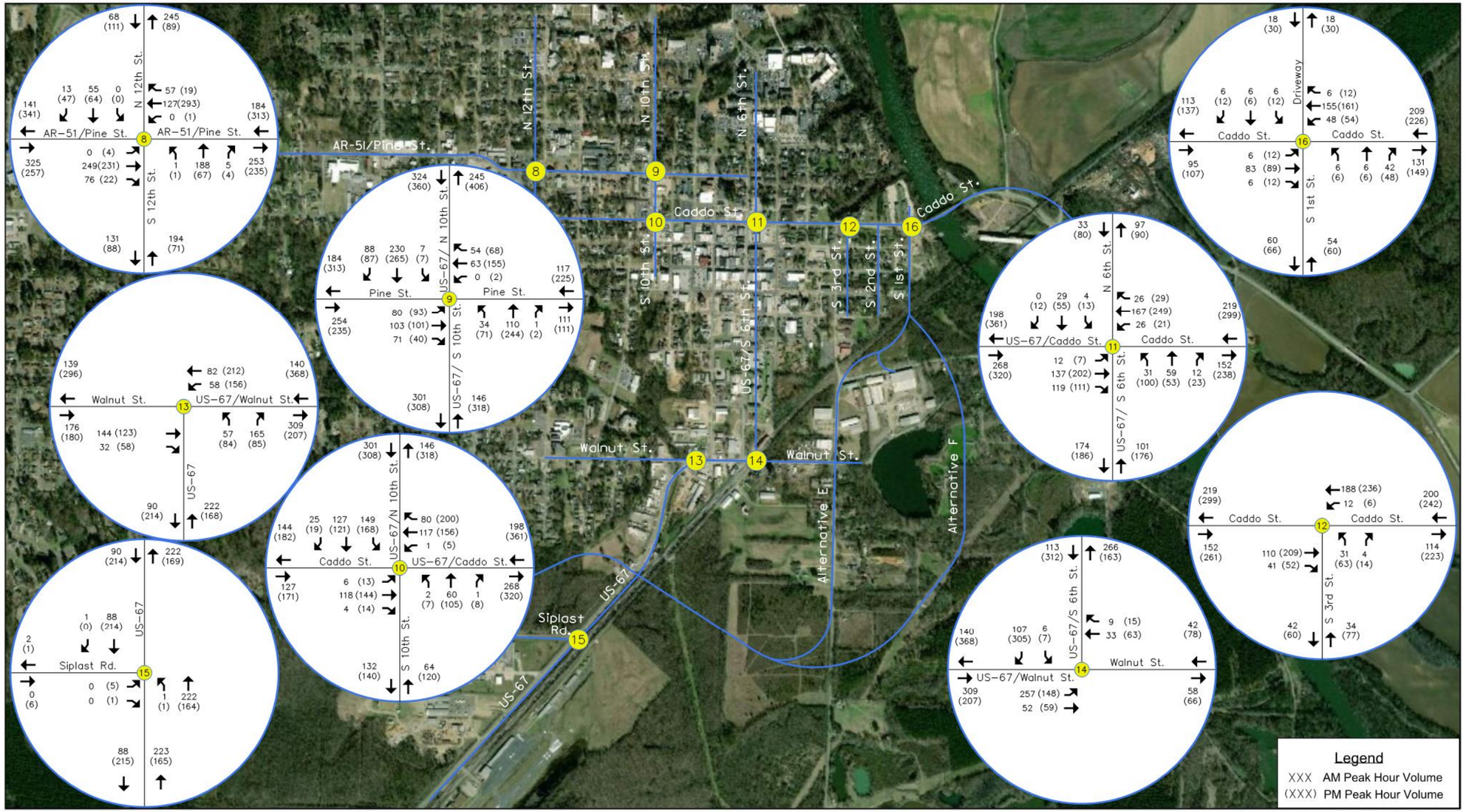
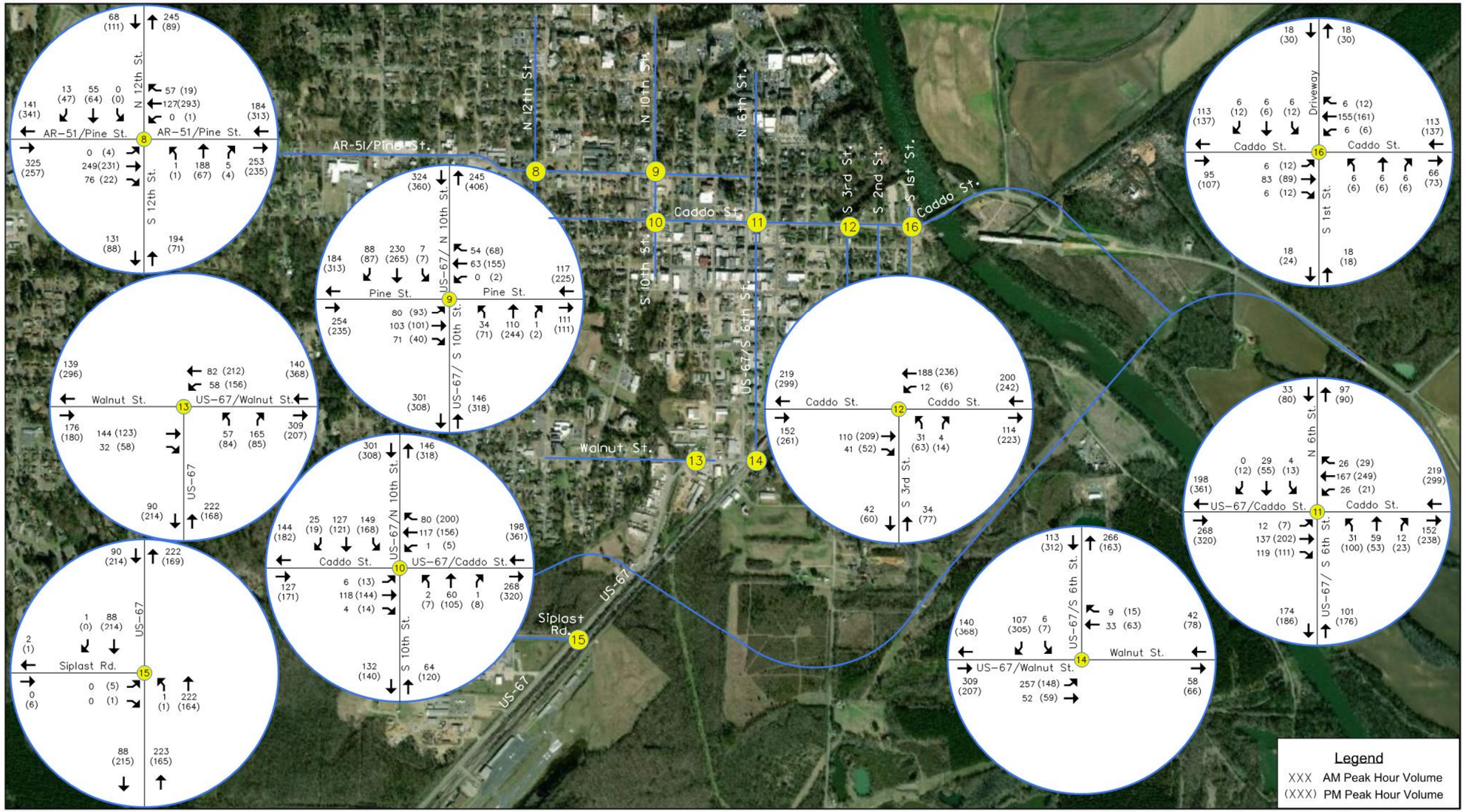


Figure 15: 2040 Eastern Portion - Alternative G Volumes



2040 ALTERNATIVES ANALSYIS

Traffic operations were evaluated for all bypass alternatives. The intersections were analyzed using the same methodologies as the Existing and the 2040 No Action conditions. All Action Alternative conditions assumed completion of the full bypass for 2040 and were evaluated as western improvement alternatives and eastern improvement alternatives. For the western bypass alternatives that extended to the existing interchange, the improved intersections near the interchange were analyzed as signals and as roundabouts. For the new interchange alternative, the study intersections were analyzed only as signals. The results of the intersection analyses and the roadway segment analyses are described in the following subsections.

2040 Intersection Analysis, Western Alternative Conditions

The results from the western intersection analyses for both signalized intersections and roundabout intersections are shown in **Table 16** through **Table 31**. The results from the analyses that included the new interchange are shown in **Table 32** and **Table 33**. The complete results are provided in **Appendix B - Intersection Operational Analysis Results.**

The results of the operational analysis of the Western Action Alternatives indicate similar delays for each scenario. Generally, the overall intersection LOS for the signalized intersections on the western end of study area operate acceptably during AM and PM peak hours, with an unacceptable LOS for certain movements for Alternatives 1, 2 and 3. The western end of the study area operates well with roundabout intersections during both AM and PM peak hours for all proposed Action Alternatives. As would be expected with the new interchange alternative, removing bypass traffic from Highway 51/Pine Street between the interchange and Walnut decreases overall delay at each intersection during AM and PM peak hours.

Table 16: Intersection Analysis – 2040 Alternative 1 (Signals) – *HCM*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
26th St. at Pine St.	AM	Signal	LOS	A	B	A	A	A	B	C	A	B	F	A	B	C
			v/c	0.1	0.5	0.0	0.1	0.0	0.4	0.4	0.0	0.1	1.0	0.0	0.3	
			Delay	9.0	14.1	9.8	9.2	0.0	13.4	22.2	0.0	15.7	88.3	0.0	17.3	26.8
	PM		LOS	B	B	B	A	A	B	C	A	B	F	A	B	C
			v/c	0.3	0.4	0.1	0.1	0.0	0.7	0.5	0.0	0.1	1.1	0.0	0.3	
			Delay	10.9	13.2	10.3	9.7	0.0	19.9	25.5	0.0	16.0	103.6	0.0	18.0	28.6
Pine St. at Caddo St.	AM	Signal	LOS				C		C		A		A	A		A
			v/c				0.8		0.0		0.2		0.0	0.2		
			Delay				29.6		21.0		3.6		3.9	3.5		9.3
	PM		LOS				C		B		A		A	A		B
			v/c				0.9		0.1		0.2		0.0	0.3		
			Delay				26.2		17.1		5.8		6.5	6.1		11.2
Walnut St. at Pine St.	AM	Signal	LOS	B	C	C	C	B	B	B	A	A	n/a [1]	n/a [1]	n/a [1]	B
			v/c	0.0	0.8	0.8	0.0	0.5	0.5	0.3	0.3	0.4	n/a [1]	n/a [1]	n/a [1]	
			Delay	17.2	21.6	21.8	24.4	14.7	14.7	11.5	0.0	0.0	n/a [1]	n/a [1]	n/a [1]	17.9
	PM		LOS	C	C	C	C	B	n/a [1]	B	A	A	A	A	A	B
			v/c	0.0	0.8	0.8	0.0	0.8	n/a [1]	0.4	0.2	0.0	0.1	0.0	0.0	
			Delay	24.0	23.5	23.8	25.1	19.6	n/a [1]	11.4	0.0	0.0	7.8	0.0	0.0	19.8
Red Hill Rd. / Professional Park Dr. at Pine St.	AM	Signal	LOS	D	B	B	E	B	B	C	C	C	C	C	C	B
			v/c	0.8	0.5	0.5	0.5	0.4	0.3	0.0	0.0	0.0	0.1	0.0	0.2	
			Delay	41.4	11.0	10.9	68.2	14.8	13.9	28.0	27.8	27.3	28.5	27.8	21.7	17.2
	PM		LOS	D	B	B	D	C	B	B	B	B	B	B	B	C
			v/c	0.8	0.6	0.6	0.5	0.9	0.5	0.0	0.0	0.0	0.8	0.0	0.5	
			Delay	41.8	15.9	15.8	49.7	25.2	18.2	14.9	14.8	14.5	15.6	14.8	15.1	21.9
Professional Park Dr. at I-30 NB Ramps	AM	Signal	LOS	D		D				D	A			B	B	C
			v/c	0.4		0.7				0.8	0.1			0.1	0.0	
			Delay	42.4		50.8				37.8	0.1			12.7	12.2	23.2
	PM		LOS	D		D				D	A			B	B	C
			v/c	0.1		0.8				0.8	0.1			0.3	0.1	
			Delay	38.3		51.7				38.1	5.1			16.6	14.2	28.2
Bypass at Pine St.	AM	Signal	LOS				C		B		C	B	C	A		B
			v/c				0.0		0.6		0.1	0.0	0.9	0.0		
			Delay				28.7		14.7		22.2	10.7	25.4	0.0		19.6
	PM		LOS				C		B		C	B	C	A		C
			v/c				0.0		18.1		0.1	0.0	0.9	0.0		
			Delay				26.3		18.3		24.0	10.3	33.9	5.4		24.1

[1]No volume modeled making this movement
[2]Free movement
[3]HCM methodology does not calculate LOS due to unconventional configuration

Table 17: Intersection Analysis – 2040 Alternative 1 (Signals) – *SimTraffic*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
26th St. at Pine St.	AM	Signal	LOS	B	B	A	B	A	A	B	B	A	B	B	A	B
			Delay	13.5	17.0	2.6	11.3	9.7	6.8	17.2	15.7	3.9	19.2	16.2	3.7	12.5
	PM		LOS	B	B	A	B	C	B	B	B	A	B	B	A	B
			Delay	16.4	16.1	3.9	18.4	22.0	17.6	18.0	13.0	3.9	17.2	18.7	3.8	16.3
Pine St. at Caddo St.	AM	Signal	LOS				C		A		A		C	A		A
			Delay				24.4		2.0		1.2		23.9	4.6		7.4
	PM		LOS				B		A		A		B	A		A
			Delay				19.7		1.9		2.1		15.7	9.5		9.8
Walnut St. at Pine St.	AM	Signal	LOS	n/a [2]	C	C	F	B	n/a [2]	A	B	A	n/a [1]	n/a [1]	n/a [1]	C
			Delay	n/a [2]	29.2	28.5	91.4	17.9	n/a [2]	9.8	17.5	6.6	n/a [1]	n/a [1]	n/a [1]	22.5
	PM		LOS	n/a [1]	B	B	D	B	n/a [1]	B	n/a [1]	A	A	B	A	B
			Delay	n/a [1]	16.4	12.5	35.1	19.3	n/a [1]	10.5	n/a [1]	7.0	5.0	10.2	4.3	15.9
Red Hill Rd. / Professional Park Dr. at Pine St.	AM	Signal	LOS	C	A	A	D	C	A	C	C	C	D	C	A	B
			Delay	33.9	8.5	4.3	44.3	22.6	8.3	34.1	28.4	21.3	44.8	31.2	3.7	16.2
	PM		LOS	C	B	A	C	C	A	A	C	A	B	C	A	B
			Delay	29.3	14.0	1.1	23.9	27.1	9.9	7.8	20.1	0.0	15.5	23.1	8.0	19.3
Professional Park Dr. at I-30 NB Ramps	AM	Signal	LOS	D		A				A	A			C	A	A
			Delay	43.7		4.3				6.3	3.7			28.4	3.2	9.0
	PM		LOS	E		A				B	A			C	A	B
			Delay	56.7		5.3				10.8	1.7			28.0	5.8	12.7
Bypass at Pine St.	AM	One-Way Stop	LOS				E		A		D	A	D	A		C
			Delay				43.6		8.6		31.4	6.4	28.8	4.4		19.2
	PM		LOS				E		B		D	A	C	A		C
			Delay				39.7		10.3		30.2	6.7	22.1	5.4		15.5

[1]No Volume modeled making this movement
[2]Low volume modeled making this movement

Table 18: Intersection Analysis – 2040 Alternative 1 (Roundabouts) – *HCM*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
26th St. at Pine St.	AM	Signal	LOS	A	B	A	A	A	B	C	A	B	F	A	B	C
			v/c	0.1	0.5	0.0	0.1	0.0	0.4	0.4	0.0	0.1	1.0	0.0	0.3	
			Delay	9.0	14.1	9.8	9.2	0.0	13.4	22.2	0.0	15.7	88.3	0.0	17.3	26.8
	PM		LOS	B	B	B	A	A	B	C	A	B	F	A	B	C
			v/c	0.3	0.4	0.1	0.1	0.0	0.7	0.5	0.0	0.1	1.1	0.0	0.3	
			Delay	10.9	13.2	10.3	9.7	0.0	19.9	25.5	0.0	16.0	103.6	0.0	18.0	28.6
Pine St. at Caddo St.	AM	Signal	LOS				C		C		A		A	A		A
			v/c				0.8		0.0		0.2		0.0	0.2		
			Delay				29.6		21.0		3.6		3.9	3.5		9.3
	PM		LOS				C		B		A		A	A		B
			v/c				0.9		0.1		0.2		0.0	0.3		
			Delay				26.2		17.4		5.8		6.5	6.1		11.7
Walnut St. at Pine St.	AM	Signal	LOS	B	C	C	C	B	B	B	A	A	n/a [1]	n/a [1]	n/a [1]	B
			v/c	0.0	0.8	0.8	0.0	0.5	0.5	0.3	0.0	0.0	n/a [1]	n/a [1]	n/a [1]	
			Delay	17.2	22.5	22.8	24.4	14.7	14.7	11.5	0.0	0.0	n/a [1]	n/a [1]	n/a [1]	18.5
	PM		LOS	C	C	C	C	B	n/a [1]	B	A	A	A	A	A	C
			v/c	0.1	0.8	0.8	0.0	0.8	n/a [1]	0.4	0.2	0.4	0.1	0.0	0.0	
			Delay	24.1	24.7	25.1	25.1	19.6	n/a [1]	11.4	0.0	0.0	7.8	0.0	0.0	20.4
Professional Park Dr. at I-30 NB Ramps	AM	Roundabout	LOS	A						A			A			A
			v/c	0.1						0.4			0.1			
			Delay	3.6						6.9			4.3			6.2
	PM		LOS	A						A			A			A
			v/c	0.1						0.4			0.3			
			Delay	4.3						7.0			7.7			6.9
Red Hill Rd. / Professional Park Dr. at Pine St.	AM	Roundabout	LOS	A			A			A			A			A
			v/c	0.5			0.5			0.0			0.2			
			Delay	8.4			9.0			9.2			6.8			8.5
	PM		LOS	A			B			A			C			B
			v/c	0.5			0.6			0.0			0.6			
			Delay	8.0			12.9			8.6			18.0			11.3
Bypass at Pine St.	AM	Roundabout	LOS				A			A			B			B
			v/c				0.3			0.1			0.8			
			Delay				6.0			7.7			14.5			10.1
	PM		LOS				A			A			B			A
			v/c				0.5			0.1			0.7			
			Delay				8.1			7.1			12.7			9.7

[1]No volume modeled making this movement
[2]Free movement
[3]HCM methodology does not calculate LOS due to unconventional configuration

Table 19: Intersection Analysis – 2040 Alternative 1 (Roundabouts) – *SIDRA*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
26th St. at Pine St.	AM	Signal	LOS	B	B	A	B	B	B	B	B	A	B	B	A	B
			Delay	16.2	17.0	3.8	11.2	14.1	11.6	16.5	15.7	4.5	18.2	17.0	4.1	14.0
	PM		LOS	B	B	A	B	C	B	C	B	A	C	C	A	B
			Delay	14.7	14.3	3.7	18.5	22.3	16.0	21.2	16.9	4.0	25.5	23.6	4.5	16.3
Pine St. at Caddo St.	AM	Signal	LOS				C		A		A		A	A		A
			Delay				22.4		3.8		0.8		3.3	7.5		8.2
	PM		LOS				B		A		A		A	A		B
			Delay				19.3		3.2		6.6		9.1	6.6		10.2
Walnut St. at Pine St.	AM	Signal	LOS	A			A			A			A			A
			Delay	5.3			5.3			7.6			5.0			5.6
	PM		LOS	A			A			A			A			A
			Delay	5.3			7.1			8.2			7.3			6.5
Professional Park Dr. at I-30 NB Ramps	AM	Roundabout	LOS	A						A			A			A
			Delay	3.4						6.2			4.0			5.6
	PM		LOS	A						A			A			A
			Delay	4.0						6.3			6.6			6.1
Red Hill Rd. / Professional Park Dr. at Pine St.	AM	Roundabout	LOS	A			A			A			A			A
			Delay	7.0			7.4			7.9			5.9			7.1
	PM		LOS	A			A			A			B			A
			Delay	6.8			9.7			7.5			12.6			8.8
Bypass at Pine St.	AM	Roundabout	LOS				A			A			A			A
			Delay				5.6			2.9			5.5			5.4
	PM		LOS				A			A			A			A
			Delay				7.0			6.2			5.7			6.4

[1]No volume modeled making this movement
[2]Free movement
[3]HCM methodology does not calculate LOS due to unconventional configuration

Table 20: Intersection Analysis – 2040 Alternative 2 (Signals) – *HCM*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
26th St. at Pine St.	AM	Signal	LOS	A	B	A	A	A	B	C	A	B	F	A	B	C
			v/c	0.1	0.5	0.0	0.1	0.0	0.4	0.4	0.0	0.1	1.0	0.0	0.3	
			Delay	9.0	14.1	9.8	9.2	0.0	13.4	22.2	0.0	15.7	88.3	0.0	17.3	26.8
	PM		LOS	B	B	B	A	A	B	C	A	B	F	A	B	C
			v/c	0.3	0.4	0.1	0.1	0.0	0.7	0.5	0.0	0.1	1.1	0.0	0.3	
			Delay	10.9	13.2	10.3	9.7	0.0	19.9	25.5	0.0	16.0	103.6	0.0	18.0	28.6
Pine St. at Caddo St.	AM	Signal	LOS				C		C		A		A	A		A
			v/c				0.8		0.0		0.2		0.0	0.2		
			Delay				29.6		21.0		3.6		3.9	3.5		9.3
	PM		LOS				C		B		A		A	A		B
			v/c				0.9		0.1		0.2		0.0	0.3		
			Delay				26.2		17.4		5.8		6.5	6.1		11.7
Walnut St. at Pine St.	AM	Signal	LOS	A	A	A	B	B	B	C	A	A	n/a [1]	n/a [1]	n/a [1]	B
			v/c	0.0	0.6	0.6	0.0	0.4	0.4	0.4	0.0	0.0	n/a [1]	n/a [1]	n/a [1]	
			Delay	1.4	3.6	3.8	12.1	15.2	15.1	21.5	0.0	0.0	n/a [1]	n/a [1]	n/a [1]	11.9
	PM		LOS	A	A	A	B	C	A	B	A	A	B	A	A	B
			v/c	0.0	0.6	0.6	0.0	0.6	0.0	0.5	0.0	0.0	0.1	0.0	0.0	
			Delay	8.5	6.9	7.1	17.4	20.5	0.0	19.9	0.0	0.0	14.2	0.0	0.0	14.6
Professional Park Dr. at Pine St.	AM	Signal	LOS	D	A	A	E	A	A	C	C	D	C	C	C	B
			v/c	0.9	0.4	0.1	0.5	0.5	0.2	0.2	0.4	0.6	0.1	0.0	0.1	
			Delay	46.3	8.1	6.4	68.1	5.2	4.5	31.7	34.0	41.8	34.9	29.0	30.6	17.1
	PM		LOS	D	A	A	E	A	A	C	C	D	D	C	D	B
			v/c	0.9	0.4	0.1	0.5	0.7	0.3	0.3	0.3	0.4	0.2	0.0	0.6	
			Delay	53.6	8.0	6.4	63.8	5.3	3.5	34.0	33.3	35.8	35.9	29.0	41.9	16.9
I-30 NB Off-Ramp at Professional Park Dr.	AM	Two-Way Stop	LOS	B		A					n/a [2]			n/a [2]		A
			v/c	0.4		0.0					n/a [2]			n/a [2]		
			Delay	11.9		8.8					n/a [2]			n/a [2]		7.2
	PM		LOS	B		A					n/a [2]			n/a [2]		A
			v/c	0.3		0.0					n/a [2]			n/a [2]		
			Delay	11.5		8.8					n/a [2]			n/a [2]		6.0
I-30 NB On-Ramp at Professional Park Dr.	AM	Two-Way Stop	LOS							A	A			A	A	A
			v/c							0.0	0.0			0.0	0.0	
			Delay							5.0	5.0			5.0	5.0	5.0
	PM		LOS							A	A			A	A	A
			v/c							0.0	0.0			0.0	0.0	
			Delay							5.0	5.0			5.0	5.0	5.0

[1]No volume modeled making this movement
[2]Free movement
[3]HCM methodology does not calculate LOS due to unconventional configuration

Table 21: Intersection Analysis – 2040 Alternative 2 (Signals) – *SimTraffic*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
26th St. at Pine St.	AM	Signal	LOS	B	A	A	A	A	A	B	B	A	B	B	A	A
			Delay	11.8	9.8	1.8	9.7	9.8	5.4	13.3	14.0	5.3	13.1	15.7	3.9	10.0
	PM		LOS	B	A	A	B	B	B	B	B	A	C	B	A	B
			Delay	11.4	8.3	3.2	17.4	17.1	12.9	14.3	14.6	3.7	25.2	18.1	3.8	12.7
Caddo St. at Pine St.	AM	Signal	LOS				C		A		A		A	A		A
			Delay				24.2		2.7		5.1		3.5	3.4		8.6
	PM		LOS				C		A		A		A	A		A
			Delay				22.6		4.1		5.5		10.0	4.9		9.8
Walnut St. at Pine St.	AM	Signal	LOS	n/a [2]	B	B	E	B	A	B	B	A	n/a [1]	n/a [1]	n/a [1]	B
			Delay	n/a [2]	14.2	13.0	69.7	11.9	5.9	19.2	17.7	3.4	n/a [1]	n/a [1]	n/a [1]	14.1
	PM		LOS	D	B	B	E	B	n/a [1]	B	A	A	A	B	A	B
			Delay	39.8	14.5	11.0	60.4	15.8	n/a [1]	18.2	0.0	9.5	8.4	19.8	5.8	15.0
Professional Park Dr. at Pine St.	AM	Signal	LOS	D	A	A	C	C	B	C	C	A	D	C	A	B
			Delay	35.1	7.4	2.4	28.5	20.6	16.5	29.1	29.9	9.1	42.3	34.3	6.6	17.4
	PM		LOS	C	A	A	D	C	B	C	C	A	D	D	A	B
			Delay	33.6	6.3	2.4	45.7	20.8	14.1	32.2	29.2	5.7	50.1	41.6	10.0	17.5
I-30 NB Off-Ramp at Professional Park Dr.	AM	Two-Way Stop	LOS	A		A					A			A		A
			Delay	6.2		3.1					0.3			0.5		4.0
	PM		LOS	A		A					A			A		A
			Delay	6.3		2.0					0.2			0.5		3.4
I-30 NB On-Ramp at Professional Park Dr.	AM	Two-Way Stop	LOS							A	A			A	A	A
			Delay							8.6	8.6			6.1	2.9	8.3
	PM		LOS							A	A			A	A	A
			Delay							7.7	9.0			6.5	2.4	8.1

[1]No Volume modeled making this movement
[2]Low volume modeled making this movement

Table 22: Intersection Analysis – 2040 Alternative 2 (Roundabouts) – *HCM*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
26th St. at Pine St.	AM	Signal	LOS	A	B	A	A	A	B	C	A	B	F	A	B	C
			v/c	0.1	0.5	0.0	0.1	0.0	0.4	0.4	0.0	0.1	1.0	0.0	0.3	
			Delay	9.0	14.1	9.8	9.2	0.0	13.4	22.2	0.0	15.7	88.3	0.0	17.3	26.8
	PM		LOS	B	B	B	A	A	B	C	A	B	F	A	B	C
			v/c	0.3	0.4	0.1	0.1	0.0	0.7	0.5	0.0	0.1	1.1	0.0	0.3	
			Delay	10.9	13.2	10.3	9.7	0.0	19.9	25.5	0.0	16.0	103.6	0.0	18.0	28.6
Pine St. at Caddo St.	AM	Signal	LOS				C		C		A		A	A		A
			v/c				0.8		0.0		0.2		0.0	0.2		
			Delay				29.6		21.0		3.6		3.9	3.5		9.3
	PM		LOS				C		B		A		A	A		B
			v/c				0.9		0.1		0.2		0.0	0.3		
			Delay				26.2		17.4		5.8		6.5	6.1		11.7
Walnut St. at Pine St.	AM	Roundabout	LOS	A		A	A		A	A			A			A
			v/c	0.4		0.4	0.3		0.3	0.4			0.0			
			Delay	6.0		6.1	6.2		6.0	9.2			5.3			6.5
	PM		LOS	A		A	A		A	A			A			A
			v/c	0.3		0.4	0.4		0.4	0.4			0.1			
			Delay	6.0		6.0	8.6		8.5	10.0			8.8			7.7
Professional Park Dr. at Pine St.	AM	Roundabout	LOS	A		A	B		B	D			A			B
			v/c	0.4		0.5	0.5		0.5	0.7			0.1			
			Delay	7.2		7.4	11.1		10.7	25.3			6.2			11.2
	PM		LOS	A		A	C		C	C			B			B
			v/c	0.4		0.5	0.7		0.7	0.6			0.4			
			Delay	7.3		7.4	17.5		17.5	20.4			14.7			13.6
I-30 NB Off-Ramp at Professional Park Dr.	AM	Roundabout	LOS	A							A			A		A
			v/c	0.2							0.1			0.1		
			Delay	5.1							4.3			3.3		4.6
	PM		LOS	A							A			A		A
			v/c	0.2							0.1			0.1		
			Delay	4.7							4.2			3.3		4.3
I-30 NB On-Ramp at Professional Park Dr.	AM	Roundabout	LOS							A				A		A
			v/c							0.4				0.1		
			Delay							6.9				4.3		6.6
	PM		LOS							A				A		A
			v/c							0.4				0.3		
			Delay							6.9				7.8		7.2

[1]No volume modeled making this movement
[2]Free movement
[3]HCM methodology does not calculate LOS due to unconventional configuration

Table 23: Intersection Analysis – 2040 Alternative 2 (Roundabouts) – *SIDRA*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
26th St. at Pine St.	AM	Signal	LOS	A	A	A	B	B	A	B	B	A	B	B	A	B
			Delay	9.8	7.7	2.5	10.2	12.2	4.6	14.5	14.5	4.1	18.7	16.1	6.9	10.4
	PM		LOS	B	B	A	B	B	B	B	B	A	B	B	A	B
			Delay	14.5	11.0	2.8	19.6	17.2	13.7	20.0	14.5	4.0	17.4	15.9	4.3	13.6
Caddo St. at Pine St.	AM	Signal	LOS				C		A		A		C	A		A
			Delay				24.0		2.2		3.1		20.1	6.1		8.9
	PM		LOS				B		A		A		B	A		B
			Delay				20.0		4.0		5.9		15.4	9.0		11.2
Walnut St. at Pine St.	AM	Roundabout	LOS	A			A			A			A			A
			Delay	5.3			5.3			7.6			5.0			5.6
	PM		LOS	A			A			A			A			A
			Delay	5.3			7.1			8.2			7.3			6.5
Professional Park Dr. at Pine St.	AM	Roundabout	LOS	A			A			B			A			A
			Delay	6.3			8.6			15.7			5.5			8.4
	PM		LOS	A			B			B			B			A
			Delay	6.3			12.0			13.7			11.0			9.9
I-30 NB Off-Ramp at Professional Park Dr.	AM	Roundabout	LOS	A						A			A			A
			Delay	4.7						4.1			3.2			4.3
	PM		LOS	A						A			A			A
			Delay	4.4						4.0			3.2			4.0
I-30 NB On-Ramp at Professional Park Dr.	AM	Roundabout	LOS							A			A			A
			Delay							6.1			4.0			5.9
	PM		LOS							A			A			A
			Delay							6.2			6.7			6.4

[1]No volume modeled making this movement
[2]Free movement
[3]HCM methodology does not calculate LOS due to unconventional configuration

Table 24: Intersection Analysis – 2040 Alternative 3 (Signals) – *HCM*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
26th St. at Pine St.	AM	Signal	LOS	A	B	A	A	A	B	C	A	B	F	A	B	C
			v/c	0.1	0.5	0.0	0.1	0.0	0.4	0.4	0.0	0.1	1.0	0.0	0.3	
			Delay	9.0	14.1	9.8	9.2	0.0	13.4	22.2	0.0	15.7	88.3	0.0	17.3	26.8
	PM		LOS	B	B	B	A	A	B	C	A	B	F	A	B	C
			v/c	0.3	0.4	0.1	0.1	0.0	0.7	0.5	0.0	0.1	1.1	0.0	0.3	
			Delay	10.9	13.2	10.3	9.7	0.0	19.9	25.5	0.0	16.0	103.6	0.0	18.0	28.6
Pine St. at Caddo St.	AM	Signal	LOS				C		C		A		A	A		A
			v/c				0.8		0.0		0.2		0.0	0.2		
			Delay				29.6		21.0		3.6		3.9	3.5		9.3
	PM		LOS				C		B		A		A	A		B
			v/c				0.9		0.1		0.2		0.0	0.3		
			Delay				26.2		17.4		5.8		6.5	6.1		11.7
Walnut St. at Pine St.	AM	Signal	LOS	A	A	A	B	B	B	C	A	A	n/a [1]	n/a [1]	n/a [1]	A
			v/c	0.0	0.6	0.6	0.0	0.4	0.4	0.4	0.0	0.0	n/a [1]	n/a [1]	n/a [1]	
			Delay	1.4	3.5	3.7	12.1	15.2	15.1	21.6	0.0	0.0	n/a [1]	n/a [1]	n/a [1]	10.0
	PM		LOS	A	A	A	B	C	n/a [1]	B	A	A	B	A	A	B
			v/c	0.0	0.6	0.6	0.0	0.6	n/a [1]	0.5	0.0	0.0	0.1	0.0	0.0	
			Delay	8.5	6.7	7.0	17.4	20.5	n/a [1]	19.9	0.0	0.0	14.2	0.0	0.0	14.5
Red Hill Rd. / Professional Park Dr. at Pine St.	AM	Signal	LOS	D	A	A	E	A	A	C	C	C	C	C	C	A
			v/c	0.9	0.5	0.1	0.5	0.5	0.1	0.3	0.0	0.0	0.1	0.0	0.2	
			Delay	40.6	0.6	0.2	61.9	1.4	0.7	32.4	28.6	28.6	29.3	28.6	30.6	7.3
	PM		LOS	B	B	B	A	A	A	C	C	C	C	C	C	B
			v/c	0.2	0.4	0.1	0.0	0.6	0.1	0.3	0.0	0.0	0.1	0.0	0.6	
			Delay	13.4	14.7	10.6	2.6	0.8	0.1	29.2	24.7	24.7	26.0	24.7	34.9	10.6
I-30 NB Ramps at Pine St.	AM	Signal	LOS	D	A			A	A	C	A	D				B
			v/c	0.8	0.5			0.5	0.2	0.2	0.0	0.6				
			Delay	48.4	8.4			0.8	0.6	28.1	0.0	38.6				11.1
	PM		LOS	D	A			C	C	C	A	D				C
			v/c	0.9	0.4			0.8	0.4	0.3	0.0	0.5				
			Delay	55.0	6.0			34.9	26.0	33.5	0.0	37.5				26.4

[1]No volume modeled making this movement
[2]Free movement
[3]HCM methodology does not calculate LOS due to unconventional configuration

Table 25: Intersection Analysis – 2040 Alternative 3 (Signals) – *SimTraffic*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
26th St. at Pine St.	AM	Signal	LOS	A	A	A	B	B	A	B	B	A	B	B	A	A
			Delay	8.6	7.9	2.4	11.3	10.5	8.6	14.6	12.6	4.2	15.4	16.2	3.7	9.7
	PM		LOS	B	A	A	B	B	B	C	B	A	B	B	A	B
			Delay	10.3	7.6	1.6	16.5	16.3	11.4	20.5	18.3	4.6	16.5	17.1	4.9	11.9
Caddo St. at Pine St.	AM	Signal	LOS				C		A		A		n/a [2]	A		A
			Delay				22.6		4.8		3.9		n/a [2]	3.5		7.8
	PM		LOS				B		A		A		B	A		A
			Delay				17.0		2.9		5.3		19.4	5.9		8.6
Walnut St. at Pine St.	AM	Signal	LOS	n/a [1]	B	A	C	B	A	C	B	A	n/a [1]	n/a [1]	n/a [1]	B
			Delay	n/a [1]	10.9	9.1	29.6	11.7	1.8	22.7	15.1	6.1	n/a [1]	n/a [1]	n/a [1]	12.8
	PM		LOS	B	C	B	D	B	n/a [1]	B	n/a [2]	B	B	A	A	B
			Delay	16.0	20.1	15.6	39.4	17.0	n/a [1]	19.0	n/a [2]	15.4	12.2	1.7	7.0	17.8
Red Hill Rd. / Professional Park Dr. at Pine St.	AM	Signal	LOS	D	A	A	D	B	A	C	C	A	C	C	A	B
			Delay	35.9	9.8	4.6	50.1	12.9	4.3	31.0	30.9	4.0	34.0	26.4	6.4	13.9
	PM		LOS	D	A	A	C	A	A	C	C	A	C	A	B	B
			Delay	36.5	9.3	3.8	24.7	7.7	4.4	25.3	32.9	2.3	22.3	9.1	13.3	10.3
I-30 NB Ramps at Pine St.	AM	Signal	LOS	D	A			C	A	C	E	B				B
			Delay	42.0	6.8			23.3	9.3	29.3	64.7	11.6				15.4
	PM		LOS	D	A			B	A	C	n/a [1]	A				B
			Delay	38.1	5.7			18.2	9.0	30.6	n/a [1]	7.8				15.0

[1]No Volume modeled making this movement
[2]Low volume modeled making this movement

Table 26: Intersection Analysis – 2040 Alternative 3 (Roundabouts) – *HCM*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
26th St. at Pine St.	AM	Signal	LOS	A	B	A	A	A	B	C	A	B	F	A	B	C
			v/c	0.1	0.5	0.0	0.1	0.0	0.4	0.4	0.0	0.1	1.0	0.0	0.3	
			Delay	9.0	14.1	9.8	9.2	0.0	13.4	22.2	0.0	15.7	88.3	0.0	17.3	26.8
	PM		LOS	B	B	B	A	A	B	C	A	B	F	A	B	C
			v/c	0.3	0.4	0.1	0.1	0.0	0.7	0.5	0.0	0.1	1.1	0.0	0.3	
			Delay	10.9	13.2	10.3	9.7	0.0	19.9	25.5	0.0	16.0	103.6	0.0	18.0	28.6
Pine St. at Caddo St.	AM	Signal	LOS				C		C		A		A	A		A
			v/c				0.8		0.0		0.2		0.0	0.2		
			Delay				29.6		21.0		3.6		3.9	3.5		9.3
	PM		LOS				C		B		A		A	A		B
			v/c				0.9		0.1		0.2		0.0	0.3		
			Delay				26.2		17.4		5.8		6.5	6.1		11.7
Walnut St. at Pine St.	AM	Roundabout	LOS	A			A			A			A			A
			v/c	0.7			0.3			0.3			0.0			
			Delay	6.0			6.1			9.2			0.0			6.5
	PM		LOS	A			A			A			A			A
			v/c	0.3			0.4			0.3			0.3			
			Delay	6.0			8.5			10.0			8.8			7.7
Red Hill Rd. / Professional Park Dr. at Pine St.	AM	Roundabout	LOS	A			A			B			A			A
			v/c	0.3			0.4			0.3			0.3			
			Delay	7.8			8.2			10.4			6.9			8.0
	PM		LOS	A			A			A			C			A
			v/c	0.4			0.5			0.2			0.6			
			Delay	6.9			9.5			8.9			20.9			9.6
I-30 NB Ramps at Pine St.	AM	Roundabout	LOS	A			A			C						A
			v/c	0.4			0.5			0.2						
			Delay	7.0			7.5			20.0						8.7
	PM		LOS	A			C			C						B
			v/c	0.4			0.7			0.4						
			Delay	6.8			16.2			15.1						12.3

[1]No volume modeled making this movement
[2]Free movement
[3]HCM methodology does not calculate LOS due to unconventional configuration

Table 27: Intersection Analysis – 2040 Alternative 3 (Roundabouts) – *SIDRA*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
26th St. at Pine St.	AM	Signal	LOS	B	A	A	B	A	A	B	B	A	C	B	A	A
			Delay	10.4	6.8	1.3	14.2	8.4	6.4	18.5	13.4	3.8	20.4	16.5	3.9	9.4
	PM		LOS	B	A	A	B	B	B	B	B	A	B	B	A	B
			Delay	12.1	6.2	2.0	19.3	17.5	11.9	18.3	15.4	3.6	17.0	15.6	4.8	12.2
Caddo St. at Pine St.	AM	Signal	LOS				C		A		A		B	A		A
			Delay				23.4		3.4		3.0		16.0	3.5		7.6
	PM		LOS				C		A		A		B	A		A
			Delay				21.8		3.0		4.5		18.2	4.2		8.7
Walnut St. at Pine St.	AM	Roundabout	LOS	A			A			A			A			A
			Delay	5.3			5.4			7.7			5.0			5.7
	PM		LOS	A			A			A			A			A
			Delay	5.3			7.1			8.1			7.3			6.5
Red Hill Rd. / Professional Park Dr. at Pine St.	AM	Roundabout	LOS	A			A			A			A			A
			Delay	6.6			6.9			8.4			6.0			6.8
	PM		LOS	A			A			A			B			A
			Delay	5.9			7.8			7.4			14.2			7.7
I-30 NB Ramps at Pine St.	AM	Roundabout	LOS	A			A			B						A
			Delay	6.0			6.4			13.6						7.1
	PM		LOS	A			B			B						A
			Delay	5.9			11.3			11.2						9.1

[1]No volume modeled making this movement
[2]Free movement
[3]HCM methodology does not calculate LOS due to unconventional configuration

Table 28: Intersection Analysis – 2040 Alternative 4 (Signals) – *HCM*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
26th St. at Pine St.	AM	Signal	LOS	A	B	A	A	A	B	C	A	B	F	A	B	C
			v/c	0.1	0.5	0.0	0.1	0.0	0.4	0.4	0.0	0.1	1.0	0.0	0.3	
			Delay	9.0	14.1	9.8	9.2	0.0	13.4	22.2	0.0	15.7	88.3	0.0	17.3	26.8
	PM		LOS	B	B	B	A	A	B	C	A	B	F	A	B	C
			v/c	0.3	0.4	0.1	0.1	0.0	0.7	0.5	0.0	0.1	1.1	0.0	0.3	
			Delay	10.9	13.2	10.3	9.7	0.0	19.9	25.5	0.0	16.0	103.6	0.0	18.0	28.6
Pine St. at Caddo St.	AM	Signal	LOS				C		C		A		A	A		A
			v/c				0.8		0.0		0.2		0.0	0.2		
			Delay				29.6		21.0		3.6		3.9	3.5		9.3
	PM		LOS				C		B		A		A	A		B
			v/c				0.9		0.1		0.2		0.0	0.3		
			Delay				26.2		17.4		5.8		6.5	6.1		11.7
Bypass at Pine St.	AM	One-Way Stop	LOS	B	B	B	B	B	B	C	C	C	B	B	B	B
			v/c	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.1	0.0	0.6	0.1	0.0	
			Delay	19.1	18.7	18.8	19.1	18.7	10.1	27.2	28.6	27.8	15.7	12.2	11.9	13.8
	PM		LOS	C	C	C	C	C	B	C	C	C	C	B	B	C
			v/c	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.1	0.0	0.9	0.1	0.0	
			Delay	21.7	21.2	21.2	21.5	21.2	12.3	28.0	29.7	28.6	32.4	10.4	10.1	21.0
I-30 NB Ramps / Professional Park Dr. at Pine St.	AM	Signal	LOS	C	C	C	C	C	C	B	B	B	B	B	B	C
			v/c	0.6	0.8	0.3	0.6	0.7	0.1	0.1	0.1	0.3	0.0	0.0	0.1	
			Delay	21.7	33.4	23.5	23.8	28.5	21.3	17.3	18.3	15.9	18.0	19.2	14.4	27.2
	PM		LOS	C	C	C	C	C	B	B	B	B	B	C	C	C
			v/c	0.4	0.9	0.5	0.7	0.9	0.1	0.2	0.0	0.2	0.1	0.1	0.3	
			Delay	23.3	34.7	26.3	25.4	29.4	16.3	18.6	19.6	15.3	18.9	21.3	22.0	28.3
Walnut St. at Pine St.	AM	Signal	LOS	B	C	C	C	B	B	B	A	A	n/a [1]	n/a [1]	n/a [1]	B
			v/c	0.0	0.8	0.8	0.0	0.5	0.5	0.3	0.0	0.0	n/a [1]	n/a [1]	n/a [1]	
			Delay	17.2	21.5	21.7	24.6	14.7	14.7	11.5	0.0	0.0	n/a [1]	n/a [1]	n/a [1]	17.9
	PM		LOS	C	C	C	C	B	n/a [1]	B	A	A	A	A	A	B
			v/c	0.0	0.8	0.8	0.0	0.8	n/a [1]	0.4	0.0	0.0	0.1	0.0	0.0	
			Delay	24.0	22.0	22.0	25.1	19.6	n/a [1]	11.4	0.0	0.0	7.8	0.0	0.0	19.8

[1]No volume modeled making this movement
[2]Free movement
[3]HCM methodology does not calculate LOS due to unconventional configuration

Table 29: Intersection Analysis – 2040 Alternative 4 (Signals) – *SimTraffic*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
26th St. at Pine St.	AM	Signal	LOS	B	B	A	B	B	A	B	B	A	B	B	A	B
			Delay	15.1	17.9	2.8	12.4	14.1	6.7	15.8	16.9	5.0	18.7	17.5	4.0	14.6
	PM		LOS	B	B	A	B	B	B	B	B	A	B	B	A	B
			Delay	14.7	14.7	3.0	16.4	19.4	14.9	18.2	15.5	3.6	18.9	18.1	5.1	14.9
Caddo St. at Pine St.	AM	Signal	LOS				C		A		A		n/a [1]	A		A
			Delay				17.7		2.9		0.9		n/a [1]	7.9		7.1
	PM		LOS				C		A		A		B	B		A
			Delay				16.7		2.4		2.1		10.5	11.1		9.7
Bypass at Pine St.	AM	One-Way Stop	LOS	C	C	A	C	C	A	A	C	A	B	A	A	B
			Delay	25.9	22.1	3.1	30.3	29.6	7.6	7.4	20.4	5.1	18.0	3.1	2.9	13.2
	PM		LOS	C	C	A	D	B	A	A	C	A	D	A	A	C
			Delay	32.9	27.9	3.1	45.8	11.5	9.4	9.0	23.4	2.0	37.6	3.6	3.5	20.6
I-30 NB Ramps / Professional Park Dr. at Pine St.	AM	Signal	LOS	F	F	B	C	B	A	C	C	B	C	D	A	D
			Delay	90.2	95.2	10.4	24.3	17.4	4.4	31.3	25.3	14.6	32.0	38.8	6.6	49.8
	PM		LOS	E	E	B	C	B	A	C	D	A	C	B	A	C
			Delay	65.5	72.9	11.4	27.2	16.6	3.9	24.0	35.7	10.0	23.8	19.8	7.5	33.8
Walnut St. at Pine St.	AM	Signal	LOS	E	B	B	E	B	n/a [2]	B	A	A	n/a [1]	n/a [1]	n/a [1]	B
			Delay	59.6	17.5	15.8	58.5	18.2	n/a [2]	11.3	9.7	7.5	n/a [1]	n/a [1]	n/a [1]	16.7
	PM		LOS	E	B	C	E	C	n/a [1]	B	D	A	A	B	A	C
			Delay	57.5	19.2	21.0	57.5	24.7	n/a [1]	11.9	36.2	7.1	8.5	12.0	9.1	20.3

[1]No Volume modeled making this movement
[2]Low volume modeled making this movement

Table 30: Intersection Analysis – 2040 Alternative 4 (Roundabouts) – *HCM*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
26th St. at Pine St.	AM	Signal	LOS	A	B	A	A	A	B	C	A	B	F	A	B	C
			v/c	0.1	0.5	0.0	0.1	0.0	0.4	0.4	0.0	0.1	1.0	0.0	0.3	
			Delay	9.0	14.1	9.8	9.2	0.0	13.4	22.2	0.0	15.7	88.3	0.0	17.3	26.8
	PM		LOS	B	B	B	B	A	C	C	A	B	F	A	B	C
			v/c	0.3	0.4	0.1	0.1	0.0	0.7	0.5	0.0	0.1	1.1	0.0	0.3	
			Delay	12.3	13.3	10.3	10.1	0.0	21.5	25.5	0.0	16.0	103.6	0.0	18.0	29.2
Pine St. at Caddo St.	AM	Signal	LOS				C		C		A		A	A		A
			v/c				0.8		0.0		0.2		0.0	0.2		
			Delay				29.6		21.0		3.6		3.9	3.5		9.3
	PM		LOS				C		B		A		A	A		B
			v/c				0.9		0.1		0.2		0.0	0.3		
			Delay				26.2		17.1		5.8		6.5	6.1		11.5
Bypass at Pine St.	AM	Roundabout	LOS	A			A			A			A			A
			v/c	0.7			0.3			0.3			0.0			
			Delay	7.0			6.1			7.5			6.7			6.5
	PM		LOS	A			A			A			A			A
			v/c	0.0			0.5			0.1			0.4			
			Delay	6.6			8.2			7.3			6.5			7.4
I-30 NB Ramps / Professional Park Dr. at Pine St.	AM	Roundabout	LOS	A			A			C			A			A
			v/c	0.5			0.5			0.5			0.1			
			Delay	9.2			8.5			16.1			7.2			9.7
	PM		LOS	B			B			B			C			B
			v/c	0.6			0.6			0.4			0.6			
			Delay	10.7			10.1			11.8			23.9			11.7
Walnut St. at Pine St.	AM	Signal	LOS	B	C	C	C	B	B	B	A	A	n/a [1]	n/a [1]	n/a [1]	B
			v/c	0.0	0.8	0.8	0.0	0.5	0.5	0.3	0.0	0.0	n/a [1]	n/a [1]	n/a [1]	
			Delay	17.2	22.5	22.8	24.6	14.7	14.7	11.5	0.0	0.0	n/a [1]	n/a [1]	n/a [1]	18.5
	PM		LOS	C	C	C	C	B	n/a [1]	B	A	A	A	A	A	C
			v/c	0.1	0.8	0.8	0.0	0.8	n/a [1]	0.4	0.2	0.5	0.1	0.0	0.0	
			Delay	24.1	24.7	25.1	25.1	19.6	n/a [1]	11.4	0.0	0.0	7.8	0.0	0.0	20.4

[1]No volume modeled making this movement
[2]Free movement
[3]HCM methodology does not calculate LOS due to unconventional configuration

Table 31: Intersection Analysis – 2040 Alternative 4 (Roundabouts) – *SIDRA*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
26th St. at Pine St.	AM	Signal	LOS	B	B	A	B	B	A	B	B	A	B	B	A	B
			Delay	18.1	18.5	2.9	16.2	16.7	8.0	17.1	11.9	4.6	16.3	17.4	4.2	15.0
	PM		LOS	B	B	A	B	C	B	B	B	A	B	B	A	B
			Delay	14.9	16.7	5.0	17.8	23.4	19.1	18.0	18.8	3.6	19.5	17.6	4.0	17.0
Caddo St. at Pine St.	AM	Signal	LOS				C		A		A		A	A		A
			Delay				23.5		3.1		0.8		7.6	6.3		7.9
	PM		LOS				B		A		A		B	B		B
			Delay				17.0		2.5		1.9		15.2	13.3		10.6
Walnut St. at Pine St.	AM	Signal	LOS	C	B	B	E	B	B	B	B	A	n/a [1]	n/a [1]	n/a [1]	B
			Delay	21.3	14.4	11.4	59.3	15.5	18.6	10.1	18.7	6.7	n/a [1]	n/a [1]	n/a [1]	13.9
	PM		LOS	E	B	B	D	B	n/a [1]	B	n/a [2]	A	A	A	A	B
			Delay	55.1	15.6	14.6	50.4	19.1	n/a [1]	12.1	n/a [2]	7.3	6.6	4.8	3.7	16.2
Bypass at Pine St.	AM	Roundabout	LOS	A			A			A			A			A
			Delay	5.3			5.3			7.6			5.0			5.6
	PM		LOS	A			A			A			A			A
			Delay	6.0			7.1			5.6			7.3			6.5
I-30 NB Ramps / Professional Park Dr. at Pine St.	AM	Roundabout	LOS	A			A			B			A			A
			Delay	7.6			7.0			11.7			6.2			7.8
	PM		LOS	A			A			A			B			A
			Delay	8.5			8.1			9.3			15.5			9.0

[1]No volume modeled making this movement
[2]Free movement
[3]HCM methodology does not calculate LOS due to unconventional configuration

Table 32: Intersection Analysis – 2040 New Interchange – *HCM*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
26th St. at Pine St.	AM	Signal	v/c	0.1	0.5	0.0	0.1	0.0	0.4	0.4	0.0	0.1	1.0	0.0	0.3	
			Delay	9.0	14.2	9.8	9.2	0.0	13.4	22.2	0.0	15.7	88.3	0.0	17.3	26.8
	PM		LOS	B	B	B	A	A	B	C	A	B	F	A	B	C
			v/c	0.3	0.4	0.1	0.1	0.0	0.7	0.5	0.0	0.1	1.1	0.0	0.3	
			Delay	10.9	13.2	10.2	9.6	0.0	19.8	25.6	0.0	16.0	103.7	0.0	18.1	28.6
Pine St. at Caddo St.	AM	Signal	LOS				C		C		A		A	A		A
			v/c				0.8		0.0		0.2		0.0	0.2		
			Delay				29.6		21.0		3.6		3.9	3.5		9.3
	PM		LOS				C		B		A		A	A		B
			v/c				0.9		0.1		0.2		0.0	0.3		
			Delay				28.2		17.2		5.7		6.4	6.1		12.0
Walnut St. at Pine St. / Driveway	AM	Signal	LOS	A	A	A	A	A	A	B	A	A	n/a[1]	n/a[1]	n/a[1]	A
			v/c	0.0	0.5	0.5	0.0	0.3	0.3	0.6	0.0	0.0	n/a[1]	n/a[1]	n/a[1]	
			Delay	6.3	8.1	8.2	9.1	6.0	6.0	19.2	0.0	0.0	n/a[1]	n/a[1]	n/a[1]	9.1
	PM		LOS	B	A	A	B	A	n/a[1]	B	A	A	B	A	A	B
			v/c	0.0	0.5	0.5	0.0	0.5	0.0	0.6	0.0	0.0	0.1	0.0	0.0	
			Delay	10.1	9.5	9.7	10.5	8.2	n/a[1]	18.1	0.0	0.0	13.5	0.0	0.0	10.4
Red Hill Rd. / Professional Park Dr. at Pine St.	AM	Signal	LOS	A	A	A	A	A	A	C	C	C	C	C	C	A
			v/c	0.4	0.4	0.0	0.0	0.4	0.1	0.0	0.1	0.1	0.1	0.1	0.5	
			Delay	3.7	2.4	1.4	4.3	6.0	4.5	26.6	26.4	26.5	26.9	26.4	31.2	5.1
	PM		LOS	A	A	A	A	B	A	C	C	C	C	C	C	B
			v/c	0.2	0.4	0.0	0.0	0.7	0.1	0.0	0.0	0.0	0.1	0.0	0.8	
			Delay	7.7	5.1	3.4	6.7	11.8	7.0	20.3	20.1	20.1	21.0	20.1	29.4	10.9
I-30 NB Ramps at Pine St.	AM	Signal	LOS	A	A			A	A	C	A	C				A
			v/c	0.3	0.5			0.4	0.2	0.3	0.0	0.7				
			Delay	5.2	4.6			8.7	7.3	21.2	0.0	26.9				8.2
	PM		LOS	A	A			A	A	D	A	C				A
			v/c	0.6	0.3			0.6	0.2	0.7	0.0	0.6				
			Delay	7.7	2.6			7.6	5.5	35.8	0.0	34.8				7.6

[1]No volume modeled making this movement
[2]Free movement
[3]HCM methodology does not calculate LOS due to unconventional configuration

Table 33: Intersection Analysis – 2040 New Interchange – *SimTraffic*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
26th St. at Pine St.	AM	Signal	LOS	B	A	A	B	B	A	B	B	A	B	B	A	A
			Delay	10.1	7.0	2.8	12.5	10.4	9.7	17.4	17.3	4.1	19.2	14.0	3.4	9.7
	PM		LOS	B	A	A	B	B	B	B	B	A	B	B	A	B
			Delay	12.0	5.9	2.5	16.1	14.3	10.3	15.3	12.7	3.8	18.1	15.8	4.8	11.2
Caddo St. at Pine St.	AM	Signal	LOS				C		A		A		n/a[2]	A		A
			Delay				21.5		2.8		5.1		n/a[2]	3.2		8.1
	PM		LOS				B		A		A		A	A		A
			Delay				16.5		3.2		6.1		5.7	4.7		8.6
Walnut St. at Pine St. / Driveway	AM	Signal	LOS	n/a[1]	A	A	B	A	n/a[2]	B	n/a[2]	A	n/a[1]	n/a[1]	n/a[1]	A
			Delay	n/a[1]	5.5	4.2	19.7	4.4	n/a[2]	17.5	n/a[2]	10.0	n/a[1]	n/a[1]	n/a[1]	7.0
	PM		LOS	B	A	A	n/a[2]	A	n/a[1]	B	n/a[2]	A	B	B	A	A
			Delay	12.6	6.2	5.6	n/a[2]	5.2	n/a[1]	16.2	n/a[2]	9.4	14.4	16.0	5.2	7.4
Red Hill Rd. / Professional Park Dr. at Pine St.	AM	Signal	LOS	A	A	A	A	A	A	B	C	A	C	n/a[2]	A	A
			Delay	8.4	1.6	2.2	8.5	2.7	2.2	19.6	24.7	2.1	27.6	n/a[2]	4.0	3.3
	PM		LOS	B	A	n/a[2]	B	A	A	B	C	A	C	C	A	B
			Delay	10.2	3.2	2.4	10.7	5.0	2.4	19.1	23.6	0.7	25.3	22.2	8.5	12.0
I-30 NB Ramps at Pine St.	AM	Signal	LOS	A	A			A	A	B	C	A				A
			Delay	6.7	2.0			3.5	1.8	19.9	26.9	7.0				3.8
	PM		LOS	B	A			A	A	C	n/a[1]	A				A
			Delay	11.5	3.1			7.1	4.8	32.2	n/a[1]	4.7				7.2

[1]No Volume modeled making this movement
[2]Low volume modeled making this movement

2040 Intersection Analysis, Eastern Alternative Conditions

The results from the eastern intersection analyses are shown in **Table 34** through **Table 37**. The complete results are provided in **Appendix B - Intersection Operational Analysis Results.**

The results of the operational analysis of the Eastern Action Alternatives indicate similar delays for each scenario. Generally, the overall intersection LOS for the intersections on the eastern end of study area operate acceptably during AM and PM peak hours.

Table 34: Intersection Analysis – 2040 Alternative E and F – *HCM*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Hwy 67 at Siplast Rd.	AM	One-Way Stop	LOS	n/a[1]						A	n/a[2]			n/a[2]	n/a[2]	A
			v/c	n/a[1]						0.0	n/a[2]			n/a[2]	n/a[2]	
			Delay	n/a[1]						7.4	n/a[2]			n/a[2]	n/a[2]	0.0
	PM		LOS	B						A	n/a[2]			n/a[2]	n/a[2]	A
			v/c	0.0						0.0	n/a[2]			n/a[2]	n/a[2]	
			Delay	11.4						7.8	n/a[2]			n/a[2]	n/a[2]	0.2
Hwy 67 at W Walnut St.	AM	One-Way Stop	LOS	C						A	n/a[2]			n/a[3]	n/a[3]	A
			v/c	0.4						0.0	n/a[2]			n/a[3]	n/a[3]	
			Delay	15.6						7.5	n/a[2]			n/a[3]	n/a[3]	5.7
	PM		LOS	C						A	n/a[2]			n/a[3]	n/a[3]	A
			v/c	0.5						0.1	n/a[2]			n/a[3]	n/a[3]	
			Delay	19.8						7.8	n/a[2]			n/a[3]	n/a[3]	5.9
Hwy 67/ Walnut St. at Hwy 67 / 6th St.	AM	One-Way Stop	LOS	n/a[2]	n/a[2]			B					A		n/a[2]	A
			v/c	n/a[2]	n/a[2]			0.1					0.0		n/a[2]	
			Delay	n/a[2]	n/a[2]			12.2					8.1		n/a[2]	1.2
	PM		LOS	n/a[2]	n/a[2]			B					A		n/a[2]	A
			v/c	n/a[2]	n/a[2]			0.2					0.0		n/a[2]	
			Delay	n/a[2]	n/a[2]			14.2					7.8		n/a[2]	2.0
Hwy 67 / 6th St. at Hwy 67 / Caddo St.	AM	Two-Way Stop	LOS	A	n/a[2]	n/a[2]	A	n/a[2]	n/a[2]	C			C			A
			v/c	0.0	n/a[2]	n/a[2]	0.0	n/a[2]	n/a[2]	0.3			0.1			
			Delay	7.8	n/a[2]	n/a[2]	8.0	n/a[2]	n/a[2]	17.3			16.0			4.1
	PM		LOS	A	n/a[2]	n/a[2]	A	n/a[2]	n/a[2]	E			C			B
			v/c	0.0	n/a[2]	n/a[2]	0.0	n/a[2]	n/a[2]	0.7			0.3			
			Delay	8.0	n/a[2]	n/a[2]	8.2	n/a[2]	n/a[2]	43.9			20.9			11.0
Caddo St. at S 3rd St.	AM	One-Way Stop	LOS		n/a[2]	n/a[2]	A	n/a[2]		B						A
			v/c		n/a[2]	n/a[2]	0.0	n/a[2]		0.1						
			Delay		n/a[2]	n/a[2]	7.6	n/a[2]		11.5						1.3
	PM		LOS		n/a[2]	n/a[2]	A	n/a[2]		B						A
			v/c		n/a[2]	n/a[2]	0.0	n/a[2]		0.1						
			Delay		n/a[2]	n/a[2]	8.0	n/a[2]		14.2						2.0
Caddo St. at S 1st St.	AM	Signal	LOS	A	n/a[2]	n/a[2]	A	n/a[2]	n/a[2]	B			B			A
			v/c	0.0	n/a[2]	n/a[2]	0.1	n/a[2]	n/a[2]	0.1			0.0			
			Delay	7.7	n/a[2]	n/a[2]	7.6	n/a[2]	n/a[2]	10.1			11.9			3.1
	PM		LOS	A	n/a[2]	n/a[2]	A	n/a[2]	n/a[2]	B			B			A
			v/c	0.0	n/a[2]	n/a[2]	0.0	n/a[2]	n/a[2]	0.1			0.1			
			Delay	7.7	n/a[2]	n/a[2]	7.6	n/a[2]	n/a[2]	10.2			12.4			6.5
Hwy 67/ Caddo St. at 10th St.	AM	Signal	LOS	B	A	A	C	A	A	A	A	A	A	A	A	A
			v/c	0.4	0.0	0.0	0.6	0.0	0.0	0.1	0.0	0.0	0.4	0.0	0.0	
			Delay	18.1	0.0	0.0	20.4	0.0	0.0	4.0	0.0	0.0	0.9	0.0	0.0	10.0
	PM		LOS	B	A	A	C	A	A	A	A	A	A	A	A	B
			v/c	0.3	0.0	0.0	0.8	0.0	0.0	0.2	0.0	0.0	0.5	0.0	0.0	
			Delay	13.2	0.0	0.0	21.4	0.0	0.0	7.5	0.0	0.0	4.3	0.0	0.0	12.7

[1]No volume modeled making this movement
[2]Free movement
[3]HCM methodology does not calculate LOS due to unconventional configuration

Table 34 (Continued): Intersection Analysis – 2040 Alternative E and F – *HCM*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
10th St. at Pine St.	AM	Signal	LOS	C	A	B	n/a [1]	A	B	A	A	A	A	A	A	B
			v/c	0.3	0.0	0.6	n/a [1]	0.0	0.4	0.1	0.0	0.1	0.4	0.0	0.0	
			Delay	20.7	0.0	18.9	n/a [1]	0.0	17.8	0.2	0.0	0.3	6.3	0.0	0.0	10.8
	PM		LOS	B	A	B	B	A	A	A	A	A	A	A	A	A
			v/c	0.4	0.0	0.5	0.7	0.0	0.0	0.1	0.0	0.3	0.4	0.0	0.0	
			Delay	18.3	0.0	17.7	19.9	0.0	0.0	0.4	0.0	0.8	6.9	0.0	0.0	10.0
12th St. at Pine St.	AM	Signal	LOS	n/a [1]	A	B	n/a [1]	A	B	A	A	A	n/a [1]	A	A	B
			v/c	n/a [1]	0.0	0.8	n/a [1]	0.0	0.5	0.3	0.0	0.0	n/a [1]	0.0	0.1	
			Delay	n/a [1]	0.0	15.4	n/a [1]	0.0	11.8	7.7	0.0	0.0	n/a [1]	0.0	6.5	11.8
	PM		LOS	B	A	A	B	A	A	A	A	A	n/a [1]	A	A	B
			v/c	0.5	0.0	0.0	0.7	0.0	0.0	0.1	0.0	0.0	n/a [1]	0.0	0.2	
			Delay	12.8	0.0	0.0	13.9	0.0	0.0	6.1	0.0	0.0	n/a [1]	0.0	6.7	11.7

[1]No volume modeled making this movement
[2]Free movement
[3]HCM methodology does not calculate LOS due to unconventional configuration

Table 35: Intersection Analysis – 2040 Alternative E and F – *SimTraffic*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Hwy 67 at Siplast Rd.	AM	One-Way Stop	LOS	n/a [1]		n/a [1]				A	A			A	A	A
			Delay	n/a [1]		n/a [1]				2.5	1.1			2.0	2.8	1.4
	PM		LOS	A		A				A	A			A	n/a [2]	A
			Delay	5.7		2.4				4.0	1.0			3.0	n/a [2]	2.1
Hwy 67 at W Walnut St.	AM	One-Way Stop	LOS	A		A				A	A			A	A	A
			Delay	7.5		2.5				3.5	2.4			1.6	1.9	3.8
	PM		LOS	B		A				A	A			A	A	A
			Delay	10.3		3.5				3.6	2.4			2.9	2.4	4.0
Hwy 67/ Walnut St. at Hwy 67 / 6th St.	AM	One-Way Stop	LOS	A	A			A	A				A		A	A
			Delay	1.2	1.4			7.7	3.1				1.6		1.8	1.6
	PM		LOS	A	A			A	A				A		A	A
			Delay	1.0	1.2			7.9	3.5				2.2		1.3	2.0
Hwy 67 / 6th St. at Hwy 67 / Caddo St.	AM	Two-Way Stop	LOS	A	A	A	A	A	A	A	A	A	A	A	n/a [1]	A
			Delay	4.4	2.6	2.1	3.9	0.8	0.4	7.1	8.8	5.7	9.8	8.2	n/a [1]	3.2
	PM		LOS	A	A	A	A	A	A	B	B	A	A	B	A	A
			Delay	4.8	2.8	2.0	3.2	0.7	0.4	11.3	12.1	8.0	9.7	10.2	6.2	4.4
Caddo St. at S 3rd St.	AM	One-Way Stop	LOS		A	A	A	A		A		A				A
			Delay		0.6	0.3	2.7	0.5		5.1		3.3				0.9
	PM		LOS		A	A	A	A		A		A				A
			Delay		0.7	0.4	3.1	0.6		7.7		5.2				1.5
Caddo St. at S 1st St.	AM	Signal	LOS	A	A	A	A	A	A	A	A	A	A	A	A	A
			Delay	2.6	0.3	0.1	3.0	1.7	1.8	6.9	8.3	2.9	6.6	7.1	2.4	2.0
	PM		LOS	A	A	A	A	A	A	A	A	A	A	A	A	A
			Delay	2.4	0.3	0.3	3.4	2.5	0.9	5.8	6.8	3.0	5.0	6.8	2.3	2.6
Hwy 67/ Caddo St. at 10th St.	AM	Signal	LOS	C	B	B	A	B	A	A	A	A	A	A	A	B
			Delay	22.1	18.5	12.2	9.5	18.9	9.6	4.9	4.4	1.5	6.4	5.8	3.5	10.8
	PM		LOS	C	B	A	B	B	B	A	A	A	A	A	A	B
			Delay	22.0	18.0	8.8	19.1	19.9	11.9	6.5	5.9	2.1	8.5	8.1	5.6	12.2
10th St. at Pine St.	AM	Signal	LOS	C	C	B	n/a [1]	B	A	B	A	A	A	A	A	B
			Delay	25.4	22.0	12.5	n/a [1]	17.2	6.5	10.1	3.0	0.4	7.2	6.8	4.5	10.9
	PM		LOS	C	B	B	B	B	B	B	A	A	A	A	A	B
			Delay	27.4	18.8	12.3	19.7	16.9	10.2	13.6	5.4	2.6	9.2	8.9	6.4	11.9
12th St. at Pine St.	AM	Signal	LOS	n/a [1]	B	A	n/a [1]	B	A	n/a [2]	A	A	n/a [1]	A	A	A
			Delay	n/a [1]	13.6	8.1	n/a [1]	10.6	5.8	n/a [2]	6.9	4.2	n/a [1]	5.6	3.2	9.5
	PM		LOS	B	B	A	B	B	A	n/a [2]	A	A	n/a [1]	A	A	B
			Delay	15.2	11.9	7.8	10.8	12.9	7.6	n/a [2]	6.9	3.9	n/a [1]	7.1	3.8	10.7

[1]No Volume modeled making this movement
[2]Low volume modeled making this movement

Table 36: Intersection Analysis – 2040 Alternative G – *HCM*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Hwy 67 at Siplast Rd.	AM	One-Way Stop	LOS	n/a [1]						A	n/a [2]			n/a [2]	n/a [2]	A
			v/c	n/a [1]						0.0	n/a [2]			n/a [2]	n/a [2]	
			Delay	n/a [1]						7.4	n/a [2]			n/a [2]	n/a [2]	0.0
	PM		LOS	B						A	n/a [2]			n/a [2]	n/a [2]	A
			v/c	0.0						0.0	n/a [2]			n/a [2]	n/a [2]	
			Delay	11.4						7.8	n/a [2]			n/a [2]	n/a [2]	0.2
Hwy 67 at W Walnut St.	AM	One-Way Stop	LOS	C						A	n/a [2]			n/a [3]	n/a [3]	A
			v/c	0.4						0.0	n/a [2]			n/a [3]	n/a [3]	
			Delay	15.6						7.5	n/a [2]			n/a [3]	n/a [3]	5.7
	PM		LOS	C						A	n/a [2]			n/a [3]	n/a [3]	A
			v/c	0.5						0.1	n/a [2]			n/a [3]	n/a [3]	
			Delay	19.8						7.8	n/a [2]			n/a [3]	n/a [3]	5.9
Hwy 67/ Walnut St. at Hwy 67 / 6th St.	AM	One-Way Stop	LOS	n/a [2]	n/a [2]			B					A		n/a [2]	A
			v/c	n/a [2]	n/a [2]			0.1					0.0		n/a [2]	
			Delay	n/a [2]	n/a [2]			12.2					8.1		n/a [2]	1.2
	PM		LOS	n/a [2]	n/a [2]			B					A		n/a [2]	A
			v/c	n/a [2]	n/a [2]			0.2					0.0		n/a [2]	
			Delay	n/a [2]	n/a [2]			14.2					7.8		n/a [2]	2.0
Hwy 67 / 6th St. at Hwy 67 / Caddo St.	AM	Two-Way Stop	LOS	A	n/a [2]	n/a [2]	A	n/a [2]	n/a [2]	C			C			A
			v/c	0.0	n/a [2]	n/a [2]	0.0	n/a [2]	n/a [2]	0.3			0.1			
			Delay	7.8	n/a [2]	n/a [2]	8.0	n/a [2]	n/a [2]	17.3			16.0			4.1
	PM		LOS	A	n/a [2]	n/a [2]	A	n/a [2]	n/a [2]	E			C			B
			v/c	0.0	n/a [2]	n/a [2]	0.0	n/a [2]	n/a [2]	0.7			0.3			
			Delay	8.0	n/a [2]	n/a [2]	8.2	n/a [2]	n/a [2]	43.9			20.9			11.0
Caddo St. at S 3rd St.	AM	One-Way Stop	LOS		n/a [2]	n/a [2]	A	n/a [2]		B						A
			v/c		n/a [2]	n/a [2]	0.0	n/a [2]		0.1						
			Delay		n/a [2]	n/a [2]	7.6	n/a [2]		11.5						1.3
	PM		LOS		n/a [2]	n/a [2]	A	n/a [2]		B						A
			v/c		n/a [2]	n/a [2]	0.0	n/a [2]		0.1						
			Delay		n/a [2]	n/a [2]	8.0	n/a [2]		14.2						2.0
Caddo St. at S 1st St.	AM	Signal	LOS	A	n/a [2]	n/a [2]	A	n/a [2]	n/a [2]	B			B			A
			v/c	0.1	n/a [2]	n/a [2]	0.0	n/a [2]	n/a [2]	0.0			0.0			
			Delay	7.7	n/a [2]	n/a [2]	7.5	n/a [2]	n/a [2]	10.6			10.8			1.6
	PM		LOS	A	n/a [2]	n/a [2]	A	n/a [2]	n/a [2]	B			B			A
			v/c	0.0	n/a [2]	n/a [2]	0.0	n/a [2]	n/a [2]	0.0			0.1			
			Delay	7.7	n/a [2]	n/a [2]	7.5	n/a [2]	n/a [2]	10.9			11.0			2.0
Hwy 67/ Caddo St. at 10th St.	AM	Signal	LOS	B	A	A	C	A	A	A	A	A	A	A	A	A
			v/c	0.4	0.0	0.0	0.6	0.0	0.0	0.1	0.0	0.0	0.4	0.0	0.0	
			Delay	18.1	0.0	0.0	20.4	0.0	0.0	4.0	0.0	0.0	0.9	0.0	0.0	10.0
	PM		LOS	B	A	A	C	A	A	A	A	A	A	A	A	B
			v/c	0.3	0.0	0.0	0.8	0.0	0.0	0.2	0.0	0.0	0.5	0.0	0.0	
			Delay	13.2	0.0	0.0	21.4	0.0	0.0	7.5	0.0	0.0	4.3	0.0	0.0	12.7

[1]No volume modeled making this movement
[2]Free movement
[3]HCM methodology does not calculate LOS due to unconventional configuration

Table 36 (Continued): Intersection Analysis – 2040 Alternative G – *HCM*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
10th St. at Pine St.	AM	Signal	LOS	C	A	B	n/a [1]	A	B	A	A	A	A	A	A	B
			v/c	0.3	0.0	0.6	n/a [1]	0.0	0.4	0.1	0.0	0.1	0.4	0.0	0.0	
			Delay	20.7	0.0	18.9	n/a [1]	0.0	17.8	0.2	0.0	0.3	6.3	0.0	0.0	10.8
	PM		LOS	B	A	B	B	A	A	A	A	A	A	A	A	A
			v/c	0.4	0.0	0.5	0.7	0.0	0.0	0.1	0.0	0.3	0.4	0.0	0.0	
			Delay	18.3	0.0	17.7	19.9	0.0	0.0	0.4	0.0	0.8	6.9	0.0	0.0	10.0
12th St. at Pine St.	AM	Signal	LOS	n/a [1]	A	B	n/a [1]	A	B	A	A	A	n/a [1]	A	A	B
			v/c	n/a [1]	0.0	0.8	n/a [1]	0.0	0.5	0.3	0.0	0.0	n/a [1]	0.0	0.1	
			Delay	n/a [1]	0.0	15.4	n/a [1]	0.0	11.8	7.7	0.0	0.0	n/a [1]	0.0	6.5	11.8
	PM		LOS	B	A	A	B	A	A	A	A	A	n/a [1]	A	A	B
			v/c	0.5	0.0	0.0	0.7	0.0	0.0	0.1	0.0	0.0	n/a [1]	0.0	0.2	
			Delay	12.8	0.0	0.0	13.9	0.0	0.0	6.1	0.0	0.0	n/a [1]	0.0	6.7	11.7

[1]No volume modeled making this movement
[2]Free movement
[3]HCM methodology does not calculate LOS due to unconventional configuration

Table 37: Intersection Analysis – 2040 Alternative G – *SimTraffic*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Hwy 67 at Siplast Rd.	AM	One-Way Stop	LOS	n/a[1]		n/a[1]				n/a[2]	A			A	n/a[2]	A
			Delay	n/a[1]		n/a[1]				n/a[2]	1.1			2.2	n/a[2]	1.5
	PM		LOS	n/a[2]		n/a[2]				n/a[2]	A			A	n/a[2]	A
			Delay	n/a[2]		n/a[2]				n/a[2]	0.9			2.4	n/a[2]	1.8
Hwy 67 at W Walnut St.	AM	One-Way Stop	LOS	A		A				A	A			A	A	A
			Delay	7.5		2.4				3.5	2.6			1.7	2.1	3.9
	PM		LOS	A		A				A	A			A	A	A
			Delay	9.1		2.6				3.7	2.6			2.4	2.3	3.9
Hwy 67/ Walnut St. at Hwy 67 / 6th St.	AM	One-Way Stop	LOS	A	A			A	A				n/a[2]		A	A
			Delay	0.4	0.2			5.6	2.6				n/a[2]		0.1	0.8
	PM		LOS	A	A			A	A				A		A	A
			Delay	1.1	1.2			7.5	3.4				1.1		1.2	2.0
Hwy 67 / 6th St. at Hwy 67 / Caddo St.	AM	Two-Way Stop	LOS	A	A	A	A	A	A	A	A	A	n/a[2]	A	n/a[1]	A
			Delay	4.0	2.6	2.4	4.0	0.6	0.5	7.5	8.3	6.1	n/a[2]	8.4	n/a[1]	3.1
	PM		LOS	A	A	A	A	A	A	B	B	A	A	A	A	A
			Delay	4.9	2.6	2.1	4.5	0.5	0.2	11.4	14.2	8.5	7.3	9.1	3.5	4.4
Caddo St. at S 3rd St.	AM	One-Way Stop	LOS		A	A	A	A		A		A				A
			Delay		0.3	0.5	2.4	0.4		5.3		3.1				0.9
	PM		LOS		A	A	A	A		A		A				A
			Delay		0.5	0.4	2.5	0.5		5.3		5.2				1.2
Caddo St. at S 1st St.	AM	Signal	LOS	A	A	A	n/a[1]	A	A	A	A	n/a[1]	A	A	A	A
			Delay	0.0	0.2	0.2	n/a[1]	0.5	0.8	5.3	5.3	n/a[1]	5.0	4.9	3.2	1.3
	PM		LOS	A	A	A	n/a[1]	A	A	n/a[2]	A	n/a[1]	A	A	A	A
			Delay	2.3	0.4	0.5	n/a[1]	1.0	0.5	n/a[2]	10.0	n/a[1]	5.5	7.2	2.6	1.5
Hwy 67/ Caddo St. at 10th St.	AM	Signal	LOS	B	B	A	n/a[2]	B	A	n/a[2]	A	n/a[2]	A	A	A	B
			Delay	12.0	19.0	9.4	n/a[2]	18.8	9.2	n/a[2]	5.1	n/a[2]	6.2	6.4	4.2	10.8
	PM		LOS	C	C	A	n/a[2]	C	B	A	A	A	A	A	A	B
			Delay	31.8	20.1	9.3	n/a[2]	21.3	12.4	6.0	6.4	0.7	9.5	8.9	4.2	13.1
10th St. at Pine St.	AM	Signal	LOS	B	B	B	n/a[1]	B	A	B	A	n/a[2]	A	A	A	B
			Delay	18.4	18.0	13.5	n/a[1]	19.0	8.7	10.8	4.3	n/a[2]	10.0	6.3	4.4	10.4
	PM		LOS	C	B	B	n/a[2]	B	B	B	A	A	B	A	A	B
			Delay	25.1	17.0	11.5	n/a[2]	15.1	11.2	14.0	5.0	2.2	11.5	9.5	6.6	11.5
12th St. at Pine St.	AM	Signal	LOS	n/a[1]	B	A	n/a[1]	A	A	n/a[2]	A	B	n/a[1]	A	A	A
			Delay	n/a[1]	14.7	7.4	n/a[1]	10.0	4.3	n/a[2]	6.0	11.0	n/a[1]	5.1	3.3	9.4
	PM		LOS	n/a[2]	B	A	n/a[2]	B	A	n/a[2]	A	A	n/a[1]	A	A	A
			Delay	n/a[2]	11.5	6.4	n/a[2]	10.7	7.4	n/a[2]	6.6	1.1	n/a[1]	6.6	3.7	9.6

[1]No Volume modeled making this movement
[2]Low volume modeled making this movement

2040 Intersection Analysis, Highway 67 Improvement Alternative Condition

In addition to analyzing bypass alternatives, a Highway 67 improvement alternative (Alternative D) was also evaluated. The improved alignment extends north from west of the intersection of Highway 67 and Walnut Street toward the intersection of Caddo Street with 10th Street. Future traffic volumes for the Highway 67 Improvement Alternative are shown in **Figure 16.** The intersection analyses are shown in **Table 38** through **Table 39**. The overall intersection LOS for the study area intersections on the eastern end of study area operate acceptably during AM and PM peak hours with Alternative D improvements. The complete results are provided in **Appendix B - Intersection Operational Analysis Results.**

Figure 16: 2040 Highway 67 Improvement – Alternative D Volumes

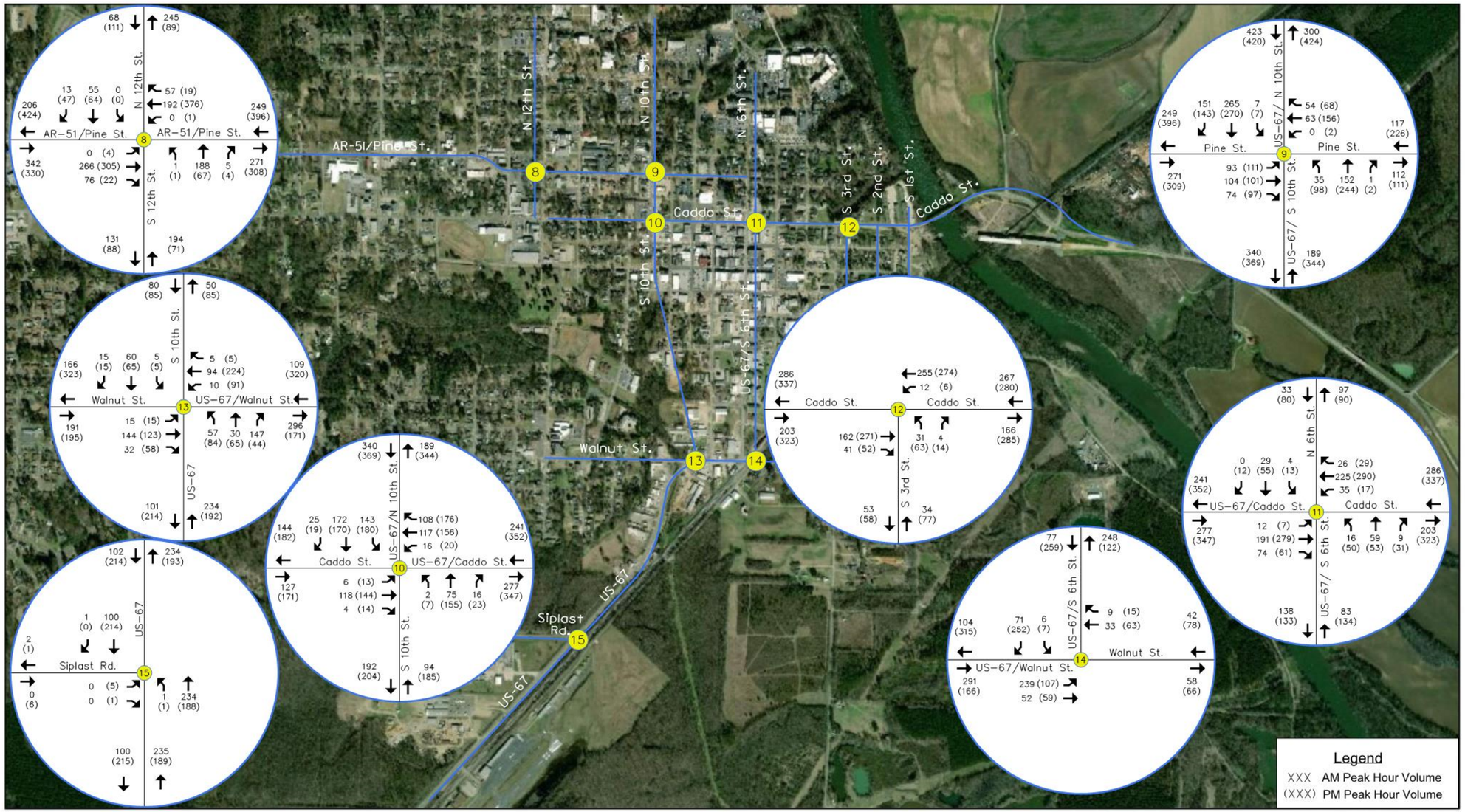


Table 38: Intersection Analysis – 2040 Alternative D – *HCM*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Hwy 67 at Siplast Rd.	AM	One-Way Stop	LOS	n/a [1]						A	n/a [2]			n/a [2]	n/a [2]	A
			v/c	n/a [1]						0.0	n/a [2]			n/a [2]	n/a [2]	
			Delay	n/a [1]						7.5	n/a [2]			n/a [2]	n/a [2]	0.0
	PM		LOS	B						A	n/a [2]			n/a [2]	n/a [2]	A
			v/c	0.0						0.0	n/a [2]			n/a [2]	n/a [2]	
			Delay	11.6						7.8	n/a [2]			n/a [2]	n/a [2]	0.2
Hwy 67 at W Walnut St.	AM	Signal	LOS	C			B			A			A			B
			v/c	0.6			0.4			0.3			0.1			
			Delay	21.1			19.6			4.4			3.3			11.6
	PM		LOS	B			B			A			A			B
			v/c	0.4			0.7			0.3			0.1			
			Delay	14.8			17.9			7.7			6.5			13.5
Hwy 67/ Walnut St. at Hwy 67 / 6th St.	AM	One-Way Stop	LOS	n/a [2]	n/a [2]			B					A		n/a [2]	A
			v/c	n/a [2]	n/a [2]			0.1					0.0		n/a [2]	
			Delay	n/a [2]	n/a [2]			11.6					8.0		n/a [2]	1.3
	PM		LOS	n/a [2]	n/a [2]			B					A		n/a [2]	A
			v/c	n/a [2]	n/a [2]			0.2					0.0		n/a [2]	
			Delay	n/a [2]	n/a [2]			12.7					7.7		n/a [2]	2.1
Hwy 67 / 6th St. at Hwy 67 / Caddo St.	AM	Two-Way Stop	LOS	A	n/a [2]	n/a [2]	A	n/a [2]	n/a [2]	C			C			A
			v/c	0.0	n/a [2]	n/a [2]	0.0	n/a [2]	n/a [2]	0.3			0.1			
			Delay	7.9	n/a [2]	n/a [2]	8.1	n/a [2]	n/a [2]	19.9			18.3			3.9
	PM		LOS	A	n/a [2]	n/a [2]	A	n/a [2]	n/a [2]	D			C			A
			v/c	0.0	n/a [2]	n/a [2]	0.0	n/a [2]	n/a [2]		0.6			0.3		
			Delay	8.1	n/a [2]	n/a [2]	8.2	n/a [2]	n/a [2]	34.2			24.1			7.5
Caddo St. at S 3rd St.	AM	One-Way Stop	LOS		n/a [2]	n/a [2]	A	n/a [2]		B						A
			v/c		n/a [2]	n/a [2]	0.0	n/a [2]		0.1						
			Delay		n/a [2]	n/a [2]	7.8	n/a [2]		13.0						1.1
	PM		LOS		n/a [2]	n/a [2]	A	n/a [2]		C						A
			v/c		n/a [2]	n/a [2]	0.0	n/a [2]		0.2						
			Delay		n/a [2]	n/a [2]	8.2	n/a [2]		16.2						1.9
Hwy 67/ Caddo St. at 10th St.	AM	Signal	LOS	B	A	A	B	A	A	A	A	A	A	A	A	A
			v/c	0.3	0.0	0.0	0.7	0.0	0.0	0.1	0.0	0.0	0.4	0.0	0.0	
			Delay	16.3	0.0	0.0	19.5	0.0	0.0	5.0	0.0	0.0	1.2	0.0	0.0	9.5
	PM		LOS	B	A	A	C	A	A	A	A	A	A	A	A	B
			v/c	0.4	0.0	0.0	0.8	0.0	0.0	0.3	0.0	0.0	0.6	0.0	0.0	
			Delay	13.4	0.0	0.0	20.7	0.0	0.0	8.1	0.0	0.0	4.7	0.0	0.0	11.9

[1]No volume modeled making this movement
[2]Free movement
[3]HCM methodology does not calculate LOS due to unconventional configuration

Table 38 (Continued): Intersection Analysis – 2040 Alternative D – *HCM*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
10th St. at Pine St.	AM	Signal	LOS	C	A	C	n/a [1]	A	B	A	A	A	A	A	A	B
			v/c	0.4	0.0	0.6	n/a [1]	0.0	0.4	0.1	0.0	0.2	0.5	0.0	0.0	
			Delay	20.4	0.0	18.3	n/a [1]	0.0	17.2	0.2	0.0	0.4	8.1	0.0	0.0	10.7
	PM		LOS	B	A	B	B	A	A	A	A	A	A	A	A	B
			v/c	0.4	0.0	0.7	0.6	0.0	0.0	0.2	0.0	0.3	0.5	0.0	0.0	
			Delay	18.5	0.0	19.0	19.3	0.0	0.0	0.7	0.0	0.8	8.2	0.0	0.0	10.7
12th St. at Pine St.	AM	Signal	LOS	n/a [1]	A	B	n/a [1]	A	B	A	A	A	n/a [1]	A	A	B
			v/c	n/a [1]	0.0	0.8	n/a [1]	0.0	0.6	0.3	0.0	0.0	n/a [1]	0.0	0.1	
			Delay	n/a [1]	0.0	15.8	n/a [1]	0.0	12.8	8.0	0.0	0.0	n/a [1]	0.0	6.8	12.4
	PM		LOS	B	A	A	B	A	A	A	A	A	n/a [1]	A	A	B
			v/c	0.6	0.0	0.0	0.7	0.0	0.0	0.1	0.0	0.0	n/a [1]	0.0	0.2	
			Delay	12.5	0.0	0.0	13.9	0.0	0.0	7.7	0.0	0.0	n/a [1]	0.0	8.4	12.2

[1]No volume modeled making this movement
[2]Free movement
[3]HCM methodology does not calculate LOS due to unconventional configuration

Table 39: Intersection Analysis – 2040 Alternative D – *SimTraffic*

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Hwy 67 at Siplast Rd.	AM	One-Way Stop	LOS	n/a [1]		n/a [1]				A				A		A
			Delay	n/a [1]		n/a [1]				0.9				2.2		1.3
	PM		LOS	A		A				A				A		A
			Delay	2.6		1.0				0.6				1.7		1.2
Hwy 67 at W Walnut St.	AM	Signal	LOS	B	C	B	B	B	A	A	A	A	A	A	A	B
			Delay	19.5	20.9	11.2	11.3	17.3	5.9	6.5	5.3	4.6	7.3	5.8	3.2	11.0
	PM		LOS	B	B	A	B	B	B	B	A	A	B	A	A	B
			Delay	19.0	13.6	7.1	17.4	17.4	15.4	10.2	9.2	4.1	10.9	9.0	5.0	13.0
Hwy 67/ Walnut St. at Hwy 67 / 6th St.	AM	One-Way Stop	LOS	A	A			A	A				A		A	A
			Delay	0.5	0.9			6.6	2.9				4.6		2.2	1.4
	PM		LOS	A	A			A	A				A		A	A
			Delay	0.4	0.6			8.2	3.7				2.8		1.7	2.4
Hwy 67 / 6th St. at Hwy 67 / Caddo St.	AM	Two-Way Stop	LOS	A	A	A	A	A	A	B	B	A	A	A	n/a [1]	A
			Delay	3.4	2.2	1.7	3.1	1.8	0.8	11.0	10.5	5.1	5.5	8.1	n/a [1]	3.4
	PM		LOS	A	A	A	A	A	A	C	B	A	B	B	B	A
			Delay	8.9	2.4	2.2	3.0	1.7	1.1	15.7	13.3	6.6	10.2	14.3	12.8	4.4
Caddo St. at S 3rd St.	AM	One-Way Stop	LOS		A	A	A	A		A		A				A
			Delay		0.9	0.6	4.6	2.2		5.3		2.8				1.9
	PM		LOS		A	A	A	A		A		A				A
			Delay		1.4	1.1	4.8	2.3		7.2		5.3				2.4
Hwy 67/ Caddo St. at 10th St.	AM	Signal	LOS	B	B	A	C	C	B	n/a [2]	A	A	A	A	A	B
			Delay	11.5	14.6	3.3	22.0	21.7	13.2	n/a [2]	3.3	1.7	7.0	5.4	3.3	10.5
	PM		LOS	C	B	A	B	C	B	A	A	A	B	B	B	B
			Delay	30.7	17.3	9.1	19.9	22.0	15.6	6.1	5.8	3.8	12.8	10.8	11.0	14.2
10th St. at Pine St.	AM	Signal	LOS	C	C	B	n/a [1]	B	A	B	A	n/a [2]	B	A	A	B
			Delay	26.3	22.5	11.6	n/a [1]	17.2	6.7	15.6	3.3	n/a [2]	10.7	8.8	5.8	11.4
	PM		LOS	C	B	B	n/a [2]	B	A	B	A	A	B	B	A	B
			Delay	25.6	18.3	13.5	n/a [2]	15.1	7.9	18.8	6.5	4.2	13.2	12.2	8.5	13.2
12th St. at Pine St.	AM	Signal	LOS	n/a [1]	B	A	n/a [1]	A	A	n/a [2]	A	A	n/a [1]	A	A	A
			Delay	n/a [1]	11.5	8.6	n/a [1]	9.5	5.6	n/a [2]	9.0	3.6	n/a [1]	7.4	3.2	9.3
	PM		LOS	B	B	A	n/a [2]	B	A	A	A	A	n/a [1]	B	A	B
			Delay	17.1	12.6	7.5	n/a [2]	12.8	7.8	1.8	8.3	1.1	n/a [1]	10.7	6.9	11.6

[1]No Volume modeled making this movement
[2]Low volume modeled making this movement

2040 Roadway Segment Analysis, Alternative Conditions

The roadway segment of the proposed bypass was also analyzed using the *HCS* two-lane highway module. Based on the volume data, a peak hour factor of 0.82 was utilized for the AM peak and a peak hour factor of 0.86 was utilized for the PM peak. From the previous study, the Alternative 3 and Alternative 7 bypass was projected to carry 4% heavy vehicles. This same percentage was used for in this study.

For the existing interchange bypass alternative analysis, the bypass was broken into four segments. Segment 1, between Pine Street and Walnut Street, was estimate to be approximately 0.4 miles in length with a base free flow speed for 45 mph based on the posted speed limit plus 10 mph according to *HCM* methodology. Between Walnut Street and near 13th Street, Bypass Segment 2 was estimated to be approximately 1.5 miles long with a base free flow speed of 55 mph. The third segment, between 13th Street and Clay Street, was estimated to be approximately 2.0 miles long with a base free flow speed of 55 mph. Segment 4, between Clay Street and Caddo Street/Highway 51 was estimated to be 0.2 miles long with a base free flow speed of 45 mph.

For the new interchange bypass alternative analysis, the bypass was broken into three segments. Segment 1, between the new interchange and 13th Street, was estimate to be approximately 2.3 miles long with a base free flow speed of 55 mph based on the posted speed limit plus 10 mph according to *HCM* methodology. The second segment, between 13th Street and Clay Street, was estimated to be approximately 2.0 miles long with a base free flow speed of 55 mph. Segment 3, between Clay Street and Caddo Street/Highway 51 was estimated to be 0.2 miles long with a base free flow speed of 45 mph.

The results of this analysis are shown in **Table 40** below. The complete results from this analysis are provided in **Appendix C - Roadway Segment Operational Analysis Results**.

These results demonstrate that the corridor currently operates at acceptable LOS throughout the study area.

Table 40: Roadway Segment Analysis – 2040 Alternative Action Conditions – *HCM*

Existing Interchanage Bypass Alternative												
Segment	Direction	Two-Lane Hwy Class	AM					PM				
			LOS	ATS (mph)	PTSF (%)	PFFS (%)	v/c	LOS	ATS (mph)	PTSF (%)	PFFS (%)	v/c
Bypass - Pine Street to Walnut Street	EB	Class III	C	33.9	65.6	79.7	0.22	C	33.9	62.7	79.7	0.21
Bypass - Walnut Street to 13th Street		Class I	B	50.9	12.1	96.0	0.06	B	50.7	28.2	95.6	0.06
Bypass - 13th Street to Clay Street		Class I	B	51.4	21.8	96.9	0.03	B	51.0	22.0	96.2	0.03
Bypass - Clay Street to Hwy 51		Class III	A	39.0	31.2	91.8	0.03	B	38.9	31.9	91.6	0.03
Bypass - Hwy 51 to Clay Street	WB	Class III	A	39.0	35.3	91.8	0.03	B	38.9	35.8	91.6	0.04
Bypass - Clay Street to 13th Street		Class I	B	51.4	24.7	96.9	0.30	B	51.3	25.2	96.8	0.04
Bypass - 13th Street to Walnut Street		Class I	B	50.8	11.2	95.8	0.06	B	50.7	29.4	95.7	0.06
Bypass - Walnut Street to Pine Street		Class III	C	34.0	62.9	80.0	0.20	C	33.6	67.5	79.1	0.23
New Interchanage Bypass Alternative												
Segment	Direction	Two-Lane Hwy Class	AM					PM				
			LOS	ATS (mph)	PTSF (%)	PFFS (%)	v/c	LOS	ATS (mph)	PTSF (%)	PFFS (%)	v/c
Bypass - New interchange to 13th Street	EB	Class I	B	50.9	12.1	96.0	0.06	B	50.7	28.2	95.6	0.06
Bypass - 13th Street to Clay Street		Class I	B	51.4	21.8	96.9	0.03	B	51.0	22.0	96.2	0.03
Bypass - Clay Street to Hwy 51		Class III	A	39.0	31.2	91.8	0.03	B	38.9	31.9	91.6	0.03
Bypass - Hwy 51 to Clay Street	WB	Class III	A	39.0	35.3	91.8	0.03	B	38.9	35.8	91.6	0.04
Bypass - Clay Street to 13th Street		Class I	B	51.4	24.7	96.9	0.30	B	51.3	25.2	96.8	0.04
Bypass - 13th Street to New Interchange		Class I	B	50.8	11.2	95.8	0.06	B	50.7	29.4	95.7	0.06

Appendix B – Public Involvement Synopsis

Public Involvement Synopsis

ARDOT Job Number 070442
Hwy. 67 – Hwy. 51 (Arkadelphia Bypass)
Clark County
Tuesday, February 5, 2019

An open-forum Public Involvement Meeting for the proposed project was held at Henderson State University (Garrison Center Grand Ball Room), 1045 McKnight Drive in Arkadelphia from 4:00 – 7:00 p.m. on Tuesday, February 5, 2019. Special efforts to involve minorities and the public in the meeting included the following:

- Display advertisement placed in *The Arkansas Democrat Gazette* on Sunday, January 20 and Sunday, February 3, 2019
- Public Service Announcement (PSA) ran on Power 92.3FM from Saturday, February 2 through Tuesday, February 5, 2019
- Outreach letters mailed and/or emailed to public officials, stakeholders, and local churches
- Flyers distributed in the project area
- Information posted on multiple websites and social media platforms
- News release published

The following information was available for inspection and comment:

- An Environmental Constraints Map exhibit on aerial photograph at a scale of 1 inch equals 0.25 miles
- An Environmental and Safety Constraints table with potential impacts for each alignment or alternative
- Two Corridor Map roll plots on aerial photography showing seven proposed bypass alignments at a scale of 1 inch equals 200 feet
- Two sets of four Interchange Alternative roll plots on aerial photography showing interchanges on Highway 51 near I-30 at a scale of 1 inch equals 200 feet
- A 5-minute rotating PowerPoint with voiceover that provided an overview of the project and the public meeting format

Handouts for the public included a comment form, a summary sheet, and small-scale maps illustrating the corridor alignments and interchange alternatives, which were identical to the aerial photograph displays. Copies of the handouts, exhibits, and PowerPoint slides are attached.

Public Involvement Synopsis
Public Meeting

Table 1 describes the results of the participation at the public officials meeting and public meeting.

Table 1	
Public Participation	**Totals**
Attendance at public officials meeting (including ARDOT and Garver staff	19
Attendance at public meeting	145
Total attendance	**164**
Comment forms received	52
Letters received (no comment form)	5

An analysis of the responses received as a result of the public form survey is shown in Table 2.

Table 2	
Survey Form Results (52 forms)	**Totals**
Feel there is a need for a proposed bypass	46
Do not feel there is a need for a proposed bypass	5
Prefer improvements to Highway 67/51 instead	15
Do not prefer improvements to Highway 67/51 instead	35
Knowledge of historical, archeological or cemetery sites	0
Knowledge of area environmental constraints	8
Beneficial impacts due to the proposed project	22
Adverse impacts due to the proposed project	9

- In general, a majority of those who commented expressed a need for a bypass and did not prefer improvements to Highway 67/51 instead.
- Most commenters felt the bypass would have beneficial impacts.

Public Involvement Synopsis
Public Meeting

An analysis of the responses received as a result of the public survey for the bypass alignments and interchange alternatives is shown in Table 3.

Table 3		
Survey Results	**Support**	**Oppose**
West: Alignment A	27	10
West: Alignment B	24	9
West: Alignment C	10	17
East: Alignment D	29	12
East: Alignment E	10	16
East: Alignment F	13	16
East: Alignment G	20	13
Interchange Alternative 1	12	17
Interchange Alternative 2	15	11
Interchange Alternative 3	11	17
Interchange Alternative 4	13	14

- Western Alignments A and B received a majority of support, while Alignment C received the greatest opposition.
- To the east, Alignments D and G received the most support, while Alignments E and F received more opposition than support.
- Interchange Alternative 2 was the only alternative that received more support than opposition.

Garver staff reviewed all comments received and evaluated their contents. The summary of comments listed below reflects the personal perception or opinion of the person or organization make the statement. The sequencing of the comments is random and is not intended to reflect importance or numerical values. Some of the comments were combined and/or paraphrased to simplify the synopsis process.

The following is a listing of comments concerning issues associated with this project:

Public Involvement Synopsis
Public Meeting

General Bypass Comments

- Nearly all comments expressed support for a bypass south of Arkadelphia and said there is a need. Commenters said truck traffic is currently an issue in the Central Business District and the number of trucks is expected to increase if the Sun Paper mill is constructed.
- Commenters discussed issues that trucks have maneuvering through the Central Business District, as well as intersections that need to be looked at. Areas mentioned included turning movements from Highway 51 to Highway 67, at I-30 exit 123, and at 10th Street and Pine Street, 10th Street and Caddo Street, and 6th Street and Caddo Street. One commenter said trucks drive up on sidewalks to make turns.
- Commenters said the bypass will open up opportunities for new business, economic development, and growth, as well as improve access and decrease congestion within the CBD, as well as safety. One comment said to make the bypass four lanes with a turning lane.
- Several commenters requested the bypass be farther outside of town.
- One commenter wished information was available regarding the number of trucks coming from each corridor.

Specific Alignment Comments

- Alignment A – Commenters said it will provide opportunity for economic development and make it easier for trucks to maneuver and not come through the city.
- Alignment B – Commenters liked the use of Red Hill Road, with some suggesting the bypass continue farther south down Red Hill Road. Commenters felt using Red Hill Road would lessen impact on business and residential areas. Others mentioned future hotel construction along the route.
- Alignment C – Several commenters said the alignment is too close to residential areas.
- Alignment D – Commenters in support said this route is cost effective, should be completed regardless of the bypass location, will make it easy for trucks to maneuver north and south and alleviates truck traffic from the CBD. Commenters with concerns said the alignment comes too far into town and trucks will still be in the CBD. Others said to make sure not to cut off pedestrian access due to this route and don't want quality of life hindered in the surrounding neighborhoods. A few suggested extending 10th Street as well as softening the turn at 10th Street and Caddo Street.
- Alignments E and F – There were only a couple comments about these alignments. One person thought the routs were too messy. Another said it would be nice to avoid the business area.
- Alignment G – Commenters said the river bridge on this alignment should have been constructed instead of the new bridge on Caddo Street, and others felt it would now be a waste of money to build a second bridge. Others, whether in support or opposed, were concerned about the cost of a new bridge. Commenters also felt that using Alignment G with Alignment A/B would be the easiest route for trucks and eliminate 90-degree turns.

Public Involvement Synopsis
Public Meeting

General Interchange Alternative Comments

- At least four commenters said they do not want the project to include roundabouts. Some commenters seemed to think there would be multiple roundabouts in this location.
- Several commenters said they wanted to see the mobile home park moved.
- One person felt the alternatives are too complex and need to be simplified.

Specific Interchange Alternative Comments

- Only a few commenters specifically mentioned an interchange in their comments. One commenter said Interchanges 1 and 4 allow space for traffic.
- Regarding Interchange 2, commenters said it has the least impact on business/residential areas and they liked the alignment with Professional Park Drive.

Suggested Routes and other Suggestions

Commenters provided numerous suggestions on new alignments or improving upon the proposed alignments. These suggestions included the following:

- Use Red Hill Road to connect to Highway 67. Won't cross rock quarry hill.
- Move I-30 interchange to Gum Springs exit or Snyder Road overpass (MM 71).
- Improve the existing CBD – repave and add turn signals at 10th and Caddo; 10th and Pine.
- Lift log-truck restrictions on interstate from Exits 69 to 78 and allow to carry full tonnage.
- Move I-30 eastbound exit farther south on Red Hill Road before Marriott. This will decrease congestion at Professional Park on-ramp and eliminate need for a roundabout at that location.
- Connect Hwy. 67 from Caddo Valley to Hwy. 51, cross Hwy. 7, continue to Gum Springs and I-30.
- Make 6th and 7th streets one-way.
- One resident is glad an option that impacted his home on Walnut (from 2013 report) is no longer under consideration, but wants to be notified if reinstated. That route followed west end of Walnut Street from Pine Street south until Walnut turns east. Then continued south and east to meet Highway 67 north of Siplast plant.
- Take route east on Pine until it intersects with 10th Street, and then turn south to Hwy. 67.
- Route should be Hwy. 67 to Country Club Road/Pizza Hut and proceed west across I-30 to Mt. Zion Road and then to Reynolds.
- I-30 at Country Club Road should have ingress and egress to highway.
- Reroute Alignment G south of the rail road bridge and continue where Alignment E is planned.
- Follow along Pine and Route 51 on Caddo. Schools are moving out of the High School.

Public Involvement Synopsis
Public Meeting

- Take Red Hill Road farther south and take former road south of Alignment B to connect to Alignment A. This will avoid hills and reduce erosion issues.
- Connect 51 to Gum Springs bridge over I-30 by going south on the west side of I-30
- Take a route south of the airport.
- Create a road on the west side of the interstate coming in on Hwy 51/26 from the west. Make the road turn between the old highway department building and Chicken Express that goes south to the overpass at Gum Springs exit.
- One person wondered why it took so long to notify landowners who might be impacted of various options under consideration after first phase of study in 2013.

Environmental or Historical

- Two commenters mentioned a landfill / old dump in area of Alignment G behind ballpark.
- Four commenters mentioned wetlands in area of Alignments A / B / C.
- Three commenters mentioned tectum dump site north of Alignment A and C, south of Walnut Street, west of Hwy. 67.
- Two commenters believe an EIS should be prepared.

Adverse Property Impacts

- The Red River Baptist Association is next to proposed bridge.
- Owner Cox Mobile Manor said some interchange alternatives will impact / ruin her property.
- Owner on 9th Street said Alignment D impacts property, shop, house, etc. but is willing to sell
- Resident on Walnut Street said bypass comes close to western edge of his property (17 acres). Believes it misses his property and doesn't object to this option. Wants to make sure recreational cabin is not impacted.
- Alignment D routes highway adjacent to owner's property, increasing traffic noise.
- Three commenters referenced the same family property, which is located along Alignments A and C, with two submitting the same form and one submitting a three-page letter.
    - The identical forms stated they thought the 2013 report showed a bypass was not warranted. At the public meeting, information was not provided on environmental and financial effects. Social information was shown but not as a take-home document. Should have been available under FOI as public record. Asked if the new bridge is a waste of tax monies and poor planning if a new bridge is built. There should be a route utilizing all existing roadways. Any of the plans will forcibly take land in their family for generations.
    - The three-page letter said a bypass should be based on relevant, repeatable and factual data, not speculation of a future pulp mill being constructed. The commenter referenced the 2013 bypass study and 2010 Highway Capacity Manual and said LOS within Arkadelphia does not warrant a new bypass. The commenter said the destination survey from that study indicates vehicles crossing the bridge are

Public Involvement Synopsis
Public Meeting

destined to the area of Arkadelphia, not to I-30 and west of Arkadelphia. A new bypass serves less of a purpose with Pine Street being widened will help east-west travel time and better handle future volumes. The commenter said alternative alignments were presented without supportive information as to why the project is needed (Purpose and Need) and associated costs. The commenter said Alignments A, B, or C from an environmental consideration will cause destruction, loss, and or degradation to wetlands and streams. The commenter opposes Alignments A, B, and C and the associated interchange alternatives. The commenter agreed that reducing truck volumes in the CBD could be beneficial, and if this is the primary objective, Alignments E or F should be considered before Alignment D, with a preference for Alignment F because it impacts fewer residents, businesses and road crossings. The commenter said either Alignment A or C will impact family land passed down for generations, and that the land is enrolled in the US Department of Agriculture's Conservation Stewardship Program.

Attachments:

- Public handouts, including blank comment form
- Small-scale display copy

ARKANSAS DEPARTMENT OF TRANSPORTATION (ARDOT)
CITIZEN COMMENT FORM

ARDOT JOB NUMBER 070442
HWY. 67 – HWY. 51 (ARKADELPHIA BYPASS)
CLARK COUNTY

LOCATION:
Henderson State University (Garrison Center Grand Ball Room)
1045 McKnight Drive, Arkadelphia, AR
4:00 – 7:00 p.m., Tuesday, February 5, 2019

Make your comments on this form and leave it with ARDOT or Garver personnel at the meeting or mail it by 4:30 p.m. on Wednesday, February 20, 2019 to: Jon Hetzel, Garver, 4701 Northshore Drive, North Little Rock, AR 72118. Alternatively, send the form via email to PublicInvolvement@GarverUSA.com.

Yes ☐ **No** ☐ Do you feel there is a need for a proposed bypass on the southern side of Arkadelphia to connect U.S. Highway 67 and State Highway 51?_____

Please indicate whether you support ☑ or oppose ☒ the corridor alignments and Hwy. 51 interchange alternatives near I-30 by circling your choices below. You may support or oppose single alignments or any combinations of alignments. Please provide comments in the space provided.

Corridor Alignments

Align A	Align B	Align C	Align D
☑	☑	☑	☑
☒	☒	☒	☒

Align E	Align F	Align G
☑	☑	☑
☒	☒	☒

Interchange Alternatives

Alt 1	Alt 2	Alt 3	Alt 4
☑	☑	☑	☑
☒	☒	☒	☒

(Continued on Back)

Yes ☐ **No** ☐ Would you prefer improvements to Highway 67/51 through the Arkadelphia Central Business District instead of a bypass alignment?____

_____

_____

_____

Yes ☐ **No** ☐ Do you know of any historical sites, family cemeteries, or archaeological sites in the project area? Please note and discuss with staff. _____

_____

_____

Yes ☐ **No** ☐ Do you know of any environmental constraints, such as endangered species, hazardous waste sites, or existing or former landfills, in the vicinity of the project? Please note and discuss with staff._____

_____

Yes ☐ **No** ☐ Do you have a suggestion that would make this proposed project better serve the needs of the community?_____

_____

_____

_____

_____

Do you feel that the proposed project will have any impacts (☐ Beneficial or ☐ Adverse) on your property and/or community (economic, environmental, social, etc.)? Please explain._____

_____

_____

It is often necessary for the ARDOT to contact property owners along potential routes. If you are a property owner along or adjacent to the route under consideration, please provide information below. Thank you.

Name (*Please Print*): _____

Address: _____ Phone: (_____) _____--_____

_____

_____

E-mail: _____

For additional information, please visit our website at www.ardot.gov.

Arkadelphia Bypass Hwy. 67 – Hwy. 51 Connection Improvement Study

Job 070442

What is the Arkadelphia Bypass Project?

The Arkansas Department of Transportation (ARDOT) is continuing to build on past planning studies and evaluating alternatives to improve traffic flow through Arkadelphia, particularly through the Central Business District (CBD). A primary concern is the truck traffic carrying raw lumber materials that must negotiate several difficult turns and pass through the CBD.

What are the Alternatives Being Considered?

Bypass Alignments

Seven alignments provide a proposed bypass south of Arkadelphia.

- Alignments A-C connect Hwy. 51 (near I-30) to Hwy. 67 near the airport.
- Alignments D-G connect Hwy. 67 to Hwy. 51 near the Ouachita River. Routes use either the recently completed river bridge or construct one farther south.

Interchange Alternatives

Four interchange alternatives connect the bypass at Hwy. 51 near I-30.

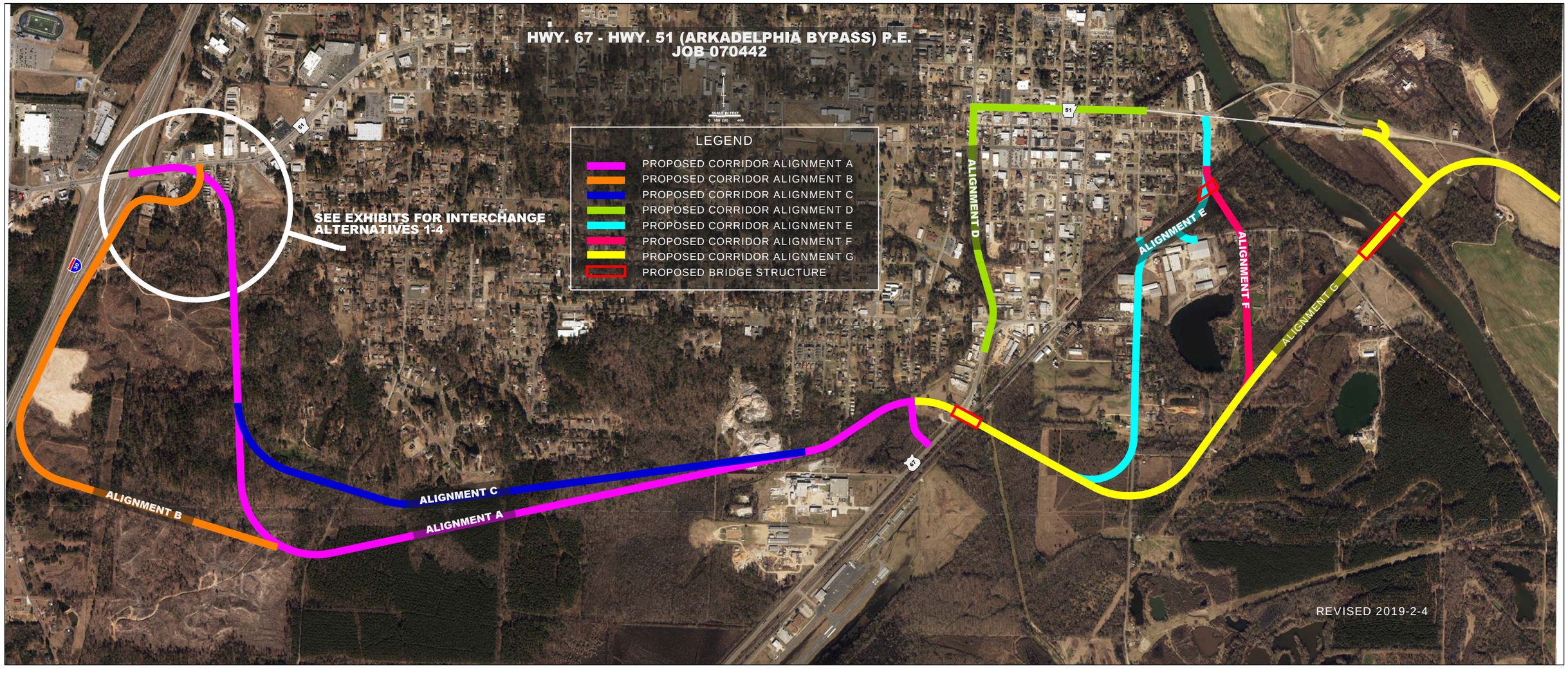
Why are we Meeting today?

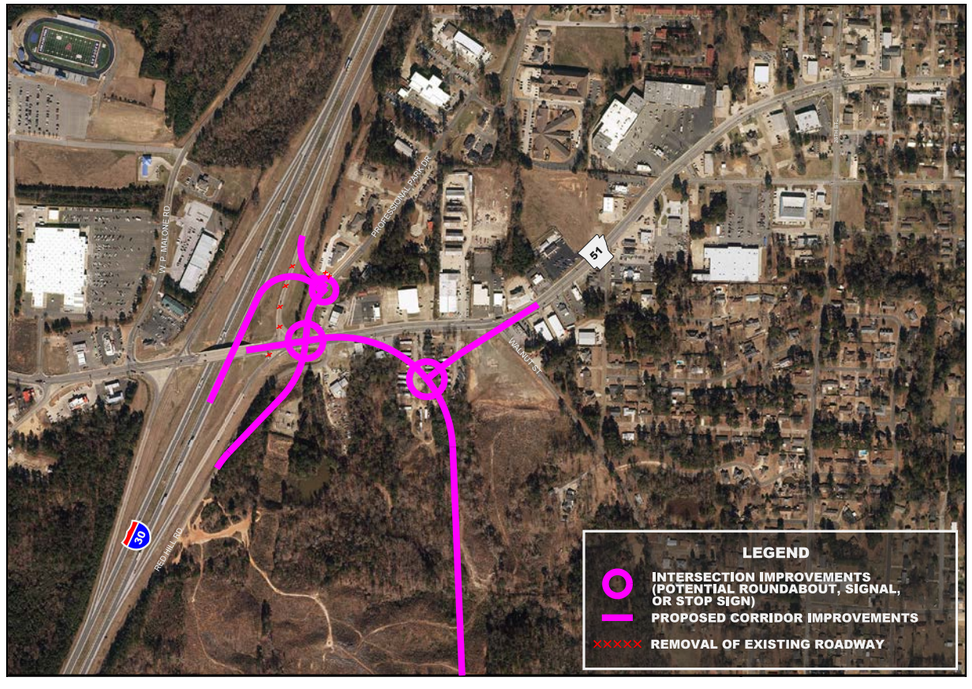
The format for the meeting is an Open House, which means there is no formal presentation. You are encouraged to view the preliminary alternatives, ask questions, and provide comments to our staff. Your comments are very important and could help shape the location and nature of future improvements. Comments may be submitted through Wednesday, February 20, 2019.

What Comes Next?

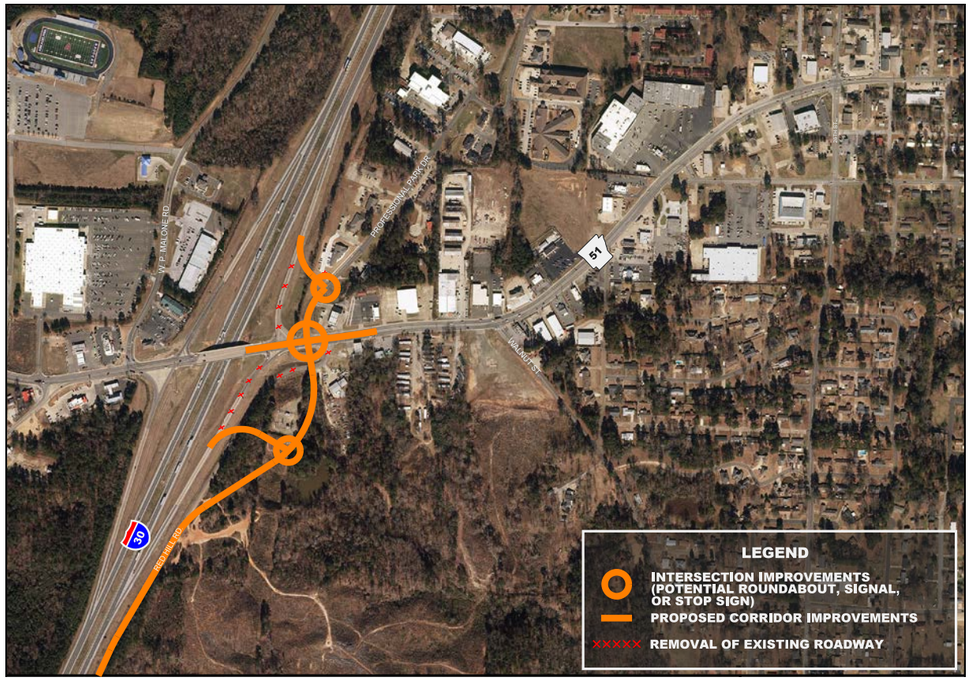
Comments received today and over the next two weeks will be considered. Based on the comments, along with environmental and design considerations, revisions will be made and a preferred alternative selected. Another meeting will be held to request feedback on the preferred alternative. There is not a funding source for construction at this time.

Meeting information is available at: *http://ardot.gov/public_meetings/2019_PM/070442/070442.aspx*

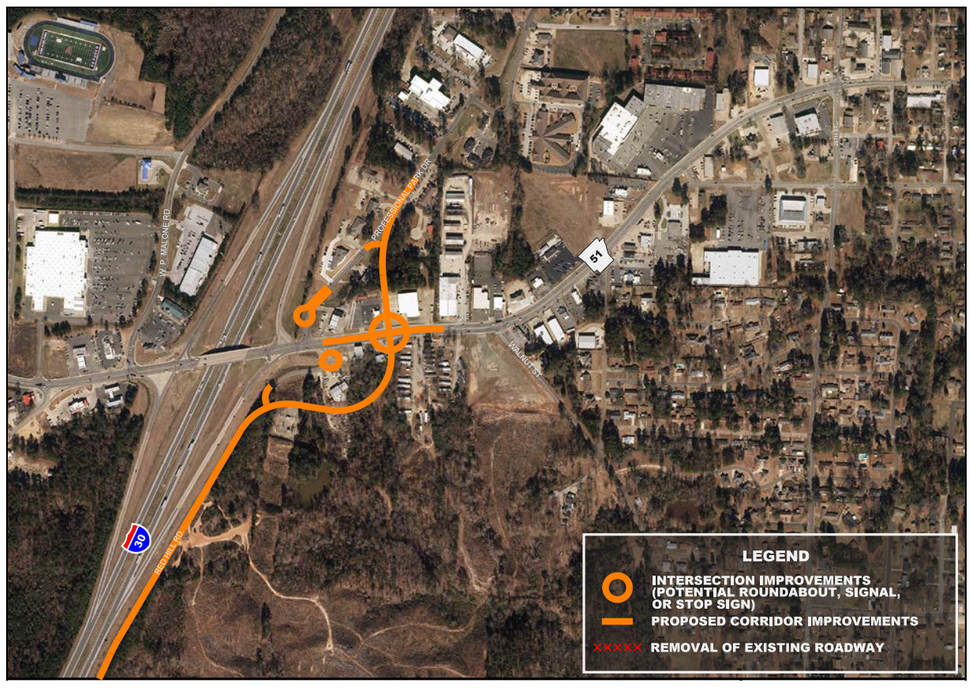

HWY. 67 - HWY. 51 (ARKADELPHIA BYPASS) P.E.
JOB 070442
SCALE IN FEET
0 100 200 400
LEGEND
PROPOSED CORRIDOR ALIGNMENT A
PROPOSED CORRIDOR ALIGNMENT B
PROPOSED CORRIDOR ALIGNMENT C
PROPOSED CORRIDOR ALIGNMENT D
PROPOSED CORRIDOR ALIGNMENT E
PROPOSED CORRIDOR ALIGNMENT F
PROPOSED CORRIDOR ALIGNMENT G
PROPOSED BRIDGE STRUCTURE
SEE EXHIBITS FOR INTERCHANGE ALTERNATIVES 1-4
ALIGNMENT B
ALIGNMENT C
ALIGNMENT A
ALIGNMENT D
ALIGNMENT E
ALIGNMENT F
ALIGNMENT G
REVISED 2019-2-4



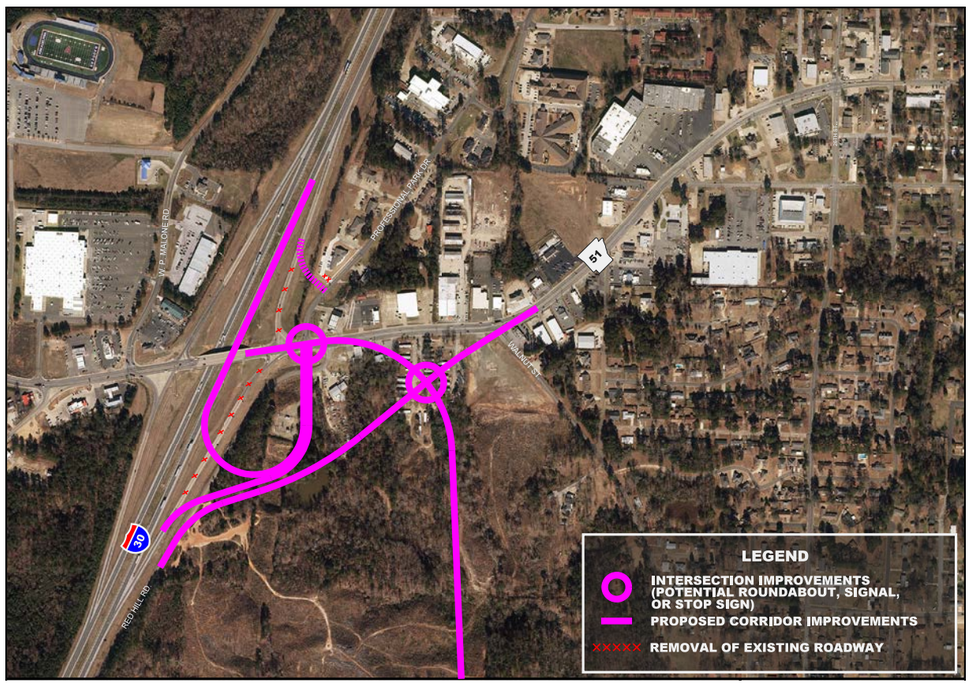
I-30/Hwy. 51 Interchange
ALTERNATIVE 1



I-30/Hwy. 51 Interchange
ALTERNATIVE 2



I-30/Hwy. 51 Interchange
ALTERNATIVE 3

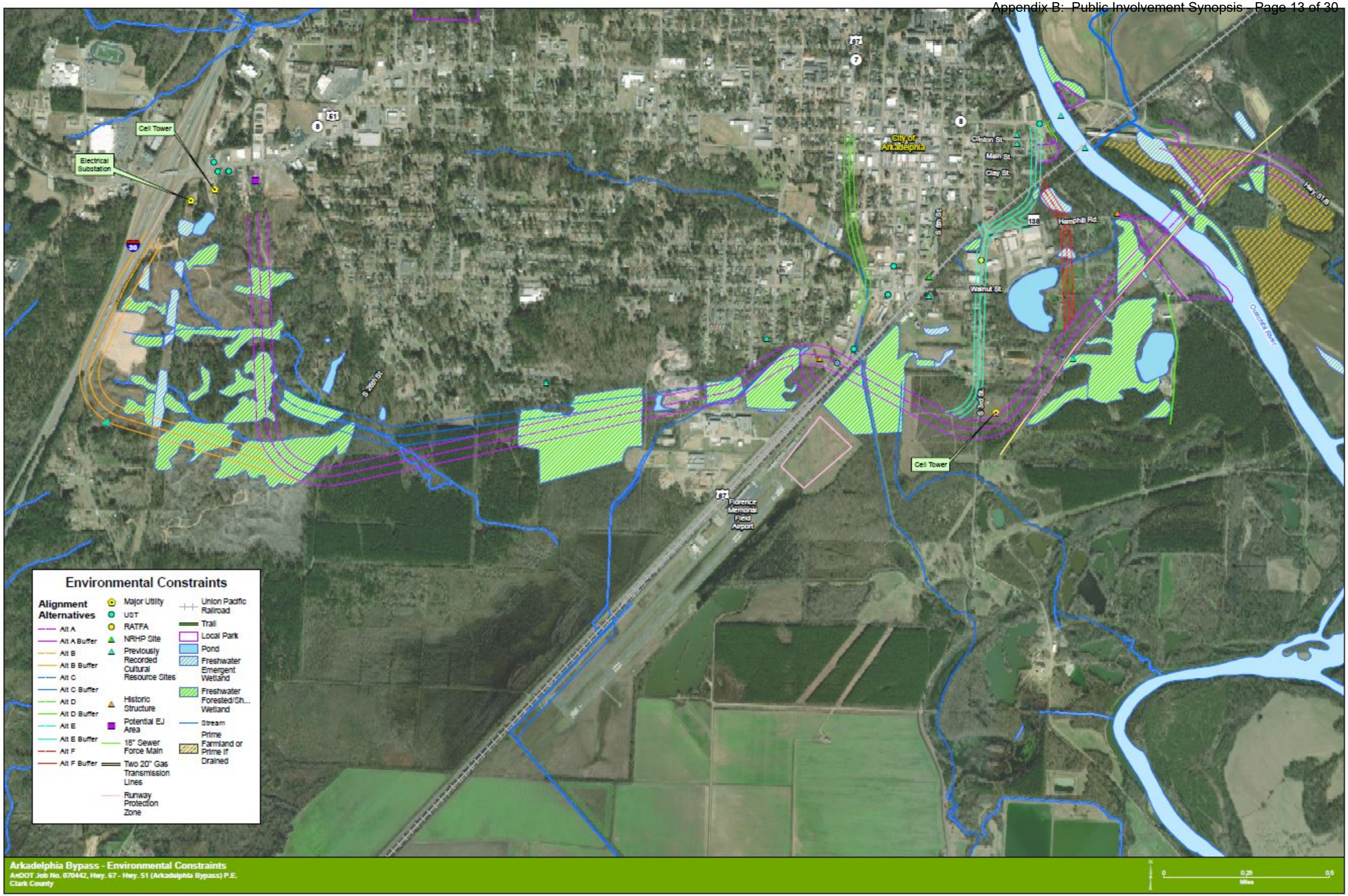


I-30/Hwy. 51 Interchange
ALTERNATIVE 4

N

SCALE IN FEET
0 100 200 400

REVISED 2019-1-21


Cell Tower
Electrical Substation
City of Arkadelphia
Clinton St.
Main St.
Clay St.
Walnut St.
Hemphill Rd.
Hwy. 51 B
Ouachita River
Cell Tower
Florence Memorial Field Airport
Environmental Constraints
Alignment Alternatives
Alt A
Alt A Buffer
Alt B
Alt B Buffer
Alt C
Alt C Buffer
Alt D
Alt D Buffer
Alt E
Alt E Buffer
Alt F
Alt F Buffer
Major Utility
UST
RATFA
NRHP Site
Previously Recorded Cultural Resource Sites
Historic Structure
Potential EJ Area
18" Sewer Force Main
Two 20" Gas Transmission Lines
Runway Protection Zone
Union Pacific Railroad
Trail
Local Park
Pond
Freshwater Emergent Wetland
Freshwater Forested/Sh... Wetland
Stream
Prime Farmland or Prime If Drained
Arkadelphia Bypass - Environmental Constraints
ArDOT Job No. 070442, Hwy. 67 - Hwy. 51 (Arkadelphia Bypass) P.E.
Clark County
0
0.25
0.5
Miles

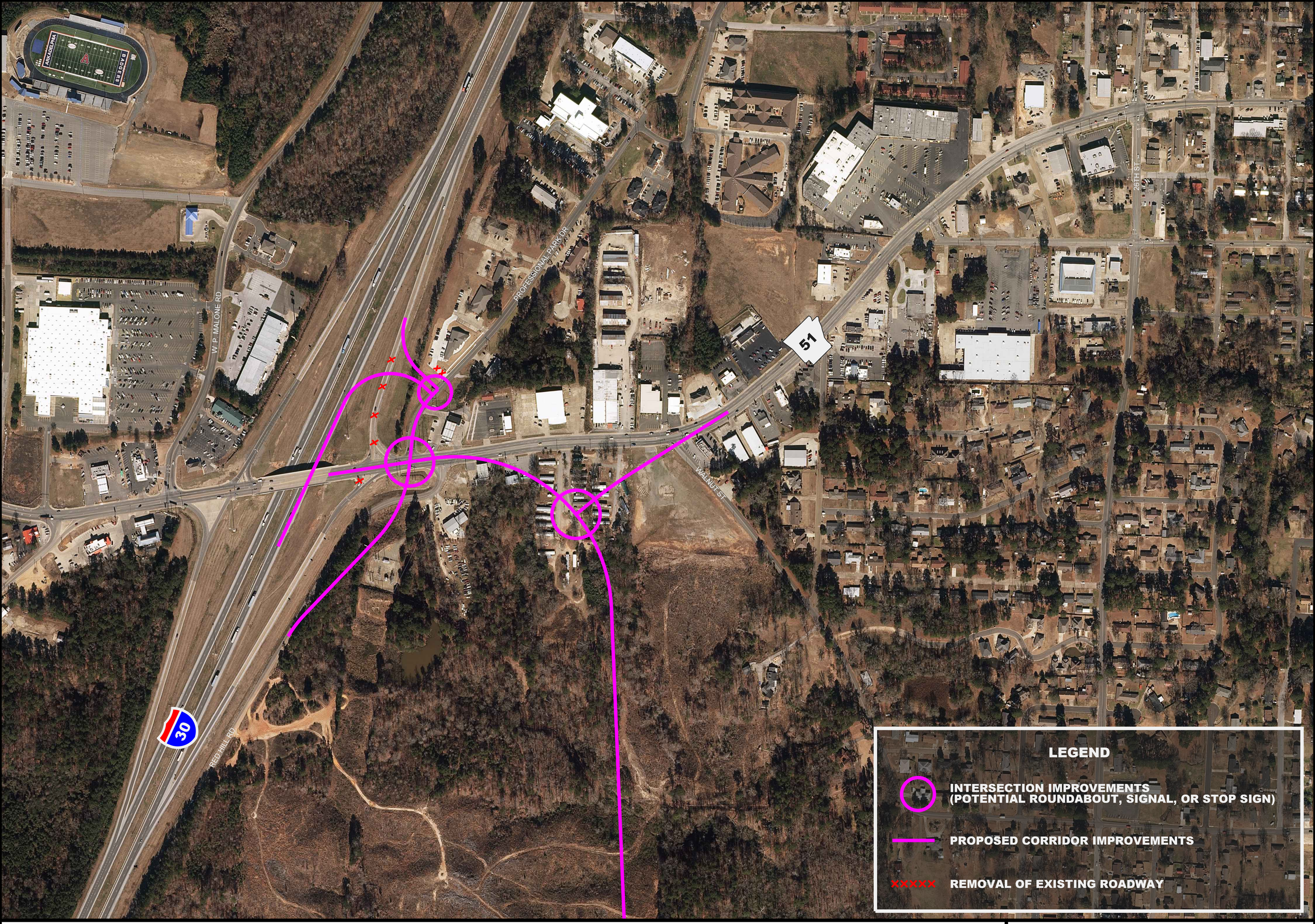
Arkadelphia Bypass

ARDOT No. 070442, Hwy. 67 - Hwy. 51 (Arkadelphia Bypass) P.E.

Environmental and Safety Constraints - All Options

			Potential Impacts									
Item #	Resource Category	Description	Mgnta/Yllw Alt A&G	Orange Alt B	Blue Alt C	Green Alt D	Cyan Alt E	Red Alt F	Interchange Alt 1	Interchange Alt 2	Interchange Alt 3	Interchange Alt 4
1	Alternative Length	Miles	5.1	1.4	1.0	0.5	1.1	0.4	--	--	--	--
2	Residential Impacts	Relocations	5	0	0	5	11	3	27	0	27	27
3	Other Structures or Major Utilities	Relocations	4	1	0	4	6	4	0	0	3	3
4	Business Impacts	Relocations	2	0	0	10	7	0	3	0	5	5
5	Roads	Crossings	8	1	0	4	8	2	3	2	3	3
6	Railroads	Crossings	1	0	0	0	1	1	0	0	0	0
7	Section 4(f) & 6(f)	Number	1	0	0	0	1	0	0	0	0	0
8	Federal Endangered and Threatened Species	Known Occurrences	1	0	0	0	0	0	0	0	0	0
9	Floodplains/Floodway	Acres	84	0	9.0	3.8	16.3	16.5	0	0	0	0
10	Hazardous Materials	Known Sites	4	0	0	0	1	0	2	2	3	3
11	Historic Resources	Known Sites	2	0	0	0	0	0	0	0	0	0
12	Streams	Crossings	8	1	1	1	1	1	0	0	0	0
13	Wetlands	Acres	50.6	12.1	13.4	0	0.5	1.8	0	0.5	0	1

HWY. 67 - HWY. 51 (ARKADELPHIA BYPASS) P.E.
JOB 070442



I-30/HWY. 51 INTERCHANGE
ALTERNATIVE 1

N

SCALE IN FEET

0 100 200 400

REVISED 2019-1-21

I-30/HWY. 51 INTERCHANGE
ALTERNATIVE 2

N

SCALE IN FEET

0 100 200 400

REVISED 2019-1-21

I-30/HWY. 51 INTERCHANGE
ALTERNATIVE 3

N

SCALE IN FEET

0 100 200 400

REVISED 2019-1-21

I-30/HWY. 51 INTERCHANGE
ALTERNATIVE 4

N

SCALE IN FEET

0 100 200 400

REVISED 2019-1-21

WELCOME

Public Meeting for the Arkadelphia Bypass Clark County

February 5, 2019

OPEN HOUSE FORMAT

- The following 5 minute presentation gives a brief project summary and how you can participate in this meeting.
- This is an "open house," so please review the maps and other materials at your own pace. You may stay and ask questions and review the materials as long as you need between 4 and 7 p.m.
- Our staff are wearing name tags. Please Ask Questions.
- Please give us feedback by filling out a comment form.

WHAT IS THE NEED FOR THIS PROJECT?

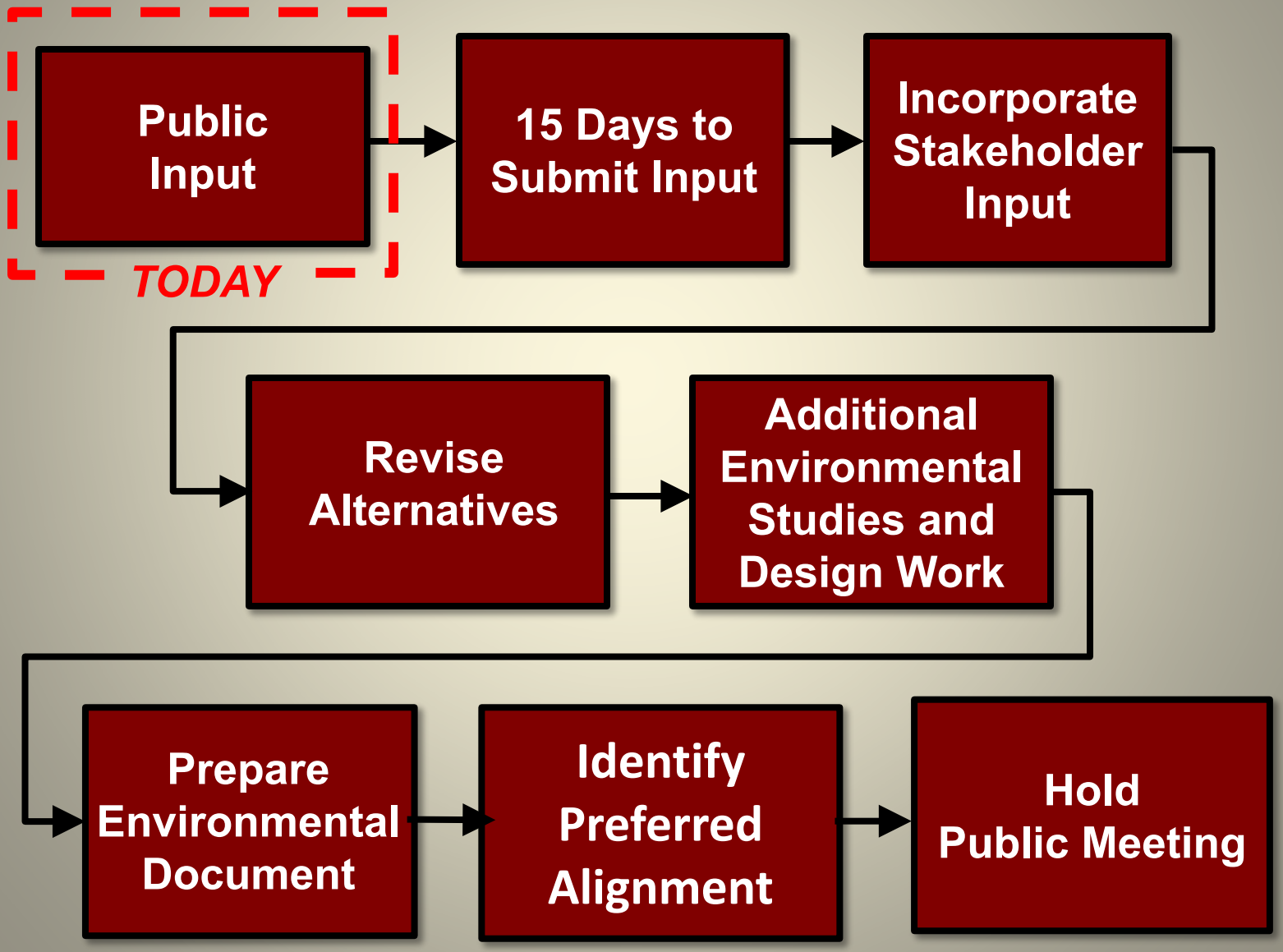
Traffic through Arkadelphia includes of a large number of trucks carrying raw lumber materials. These trucks must negotiate tight turns, especially in the Central Business District (CBD), creating mobility and safety issues.

The PURPOSE of this study is to improve traffic flow through Arkadelphia, particularly through the Central Business District, by providing improvements that enhance traffic operations and result in a safer road for vehicles and pedestrians.

WHY ARE WE HERE TONIGHT?

- This project has federal funding, which requires a review process called an Environmental Assessment (EA).
- The purpose of the EA is to identify a Preferred Alignment that minimizes the negative impacts to the natural and social environment while addressing the needs of the project to the greatest extent possible.
- We are holding this meeting tonight because Participation by the public and local officials is key to the success of this EA.
- The EA study process began in April 2018 and is estimated to be complete in November 2019.

WHAT HAPPENS NEXT?



WHAT IS CONSIDERED IN THE EA PROCESS?

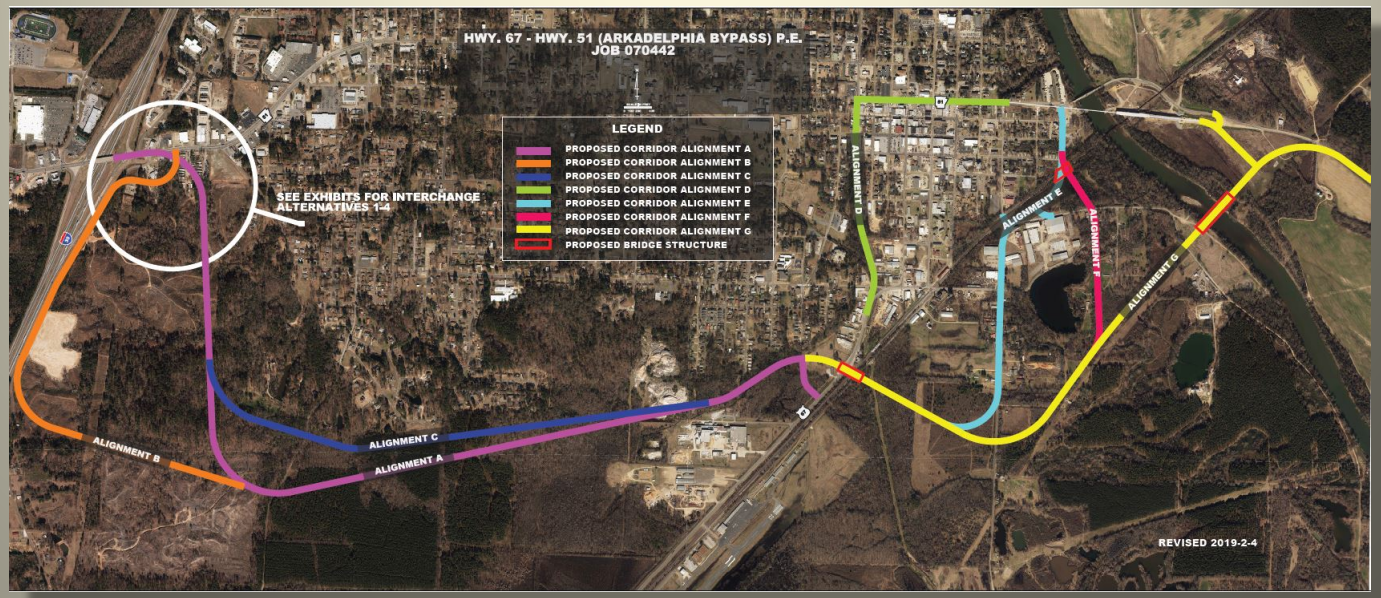
Some of the considerations in the project development are:

- Road Crossings
- Bridges and Culverts
- Railroad Crossings
- Residential Impacts
- Business Impacts
- Economic Impacts
- Indirect Impacts
- Environmental Justice
- Historic and Archeological
- Wetlands
- Floodplains
- Endangered Species
- Safety
- Community Connections
- Topography (impacts design and costs)
- Hazardous Materials Sites
- Right of Way and Construction Costs

WHAT ARE WE REVIEWING?

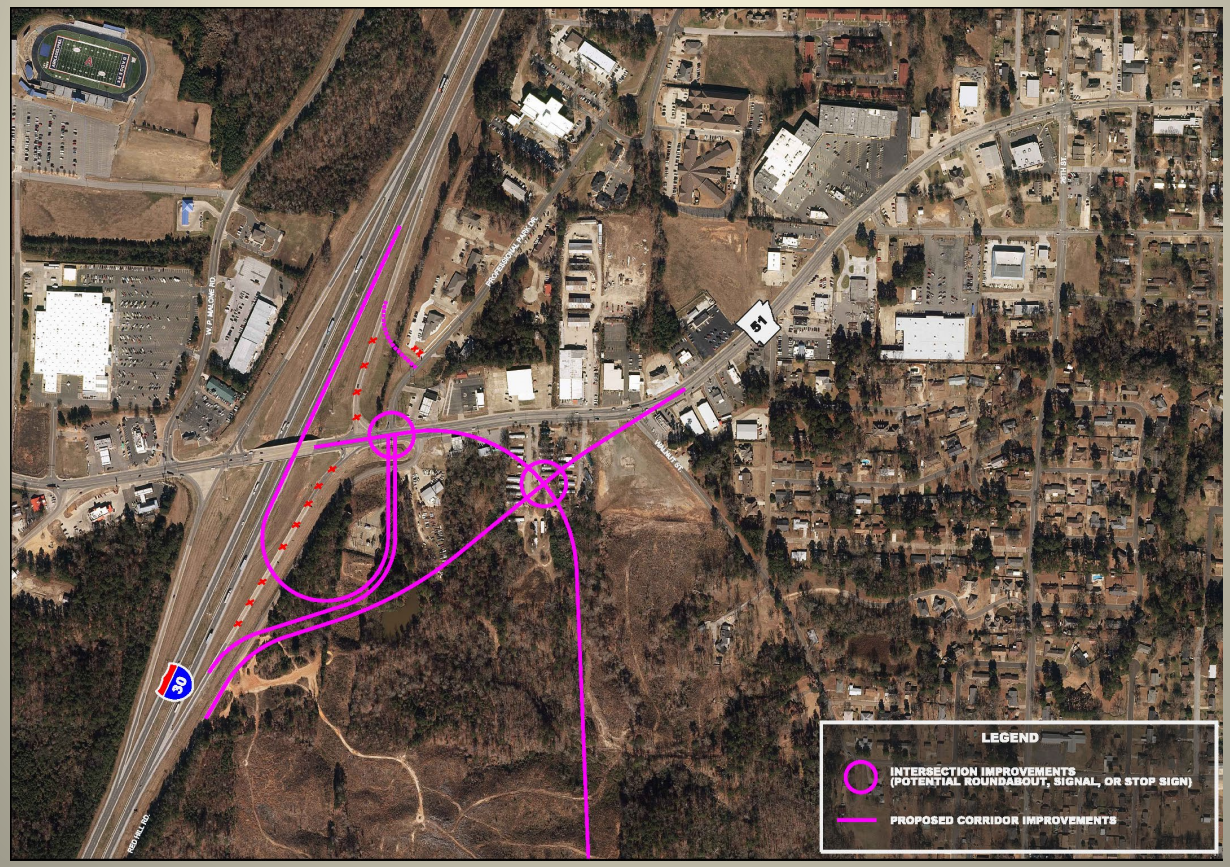
Preliminary alignments have been developed with consideration for various environmental and design concerns. There are exhibits on the tables for you to review the various bypass options.

Detailed design has not been completed – the alignments presented are close approximations so that environmental and social impacts may be evaluated and discussed.



WHAT ARE WE REVIEWING?

In addition to seven options for the main bypass segments, there are four interchange options where the western end of the bypass connects to Hwy. 51 near I-30.



WHAT DO WE EXPECT FROM THIS MEETING?

Our ultimate goal for this EA process is to identify roadway improvements that minimize the negative impacts to the natural and social environment while improving mobility, safety and the quality of life for Arkadelphia's residents and those traveling in your city.

To reach this goal, we need the involvement of your citizens and local officials, ensuring we understand the important local and regional issues and develop a plan that best fits within your community.

WHAT DO I DO NOW?

Please view the maps showing the proposed bypass alignments.

The first two tables have identical maps showing the main bypass alignments. The second set of tables have identical maps showing the interchange options near I-30.

We encourage you to fill out your comment form at the round tables in the back of the room and leave your comments with us tonight. If you are unable to provide a comment form tonight, the following slide gives additional options to provide input.

Again, our staff is here to help you understand the project and listen to your concerns. We look forward to visiting with you.

THANK YOU!

Please Submit Your Comments by: Wednesday, February 20, 2019

Leave Your Comment Form Here Tonight or

Send the Comment Form Back to:

Garver, Attn: Jon Hetzel, 4701 Northshore Drive, North Little Rock, AR 72118

Email Your Comments to: PublicInvolvement@GarverUSA.com

Information is available at:
http://ardot.gov/public_meetings/2019_PM/070442/070442.aspx

Appendix C – Agency and Tribal Coordination

Agency Consultation

Agency consultation letters and exhibits were sent to the following agencies for project coordination. Agency response dates are noted.

Arkansas Department of Environmental Quality

- Response received September 25, 2018

Arkansas Department of Health

- Response received June 6, 2018

Arkansas Department of Parks and Tourism

- Response received July 20, 2018

Arkansas Game and Fish Commission

- Response received July 20, 2018

Arkansas Historic Preservation Program

- Responses received May 14, 2018

Arkansas Natural Heritage Commission

- Responses with species occurrence data received June 12 and July 24, 2018

Arkansas Natural Resources Commission

- No response received to date

Arkadelphia Water Utilities

- No response received to date

U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS)

- Response received May 30, 2018, August 3, 2018, and February 5, 2020

U.S. Fish and Wildlife Service (USFWS)

- Responses received May 23 and July 25, 2018
- IPaC list received January 21, 2020

U.S. Geological Survey (USGS)

- No response received to date

ADEQ
ARKANSAS
Department of Environmental Quality

SEP 25 2018

Mr. Bill McAbee, Environmental Manager
Garver, LLC
4701 Northshore Drive
North Little Rock, Arkansas 72118

Re: National Environmental Policy Act (NEPA): Comments Requested Regarding Arkadelphia Bypass from Hwy. 67 to Hwy 51

Dear Mr. McAbee:

This is in reference to your July 6, 2018 submittal regarding the Arkadelphia Bypass from Hwy. 67 to Hwy 51 in Arkadelphia, Arkansas. Based upon the information submitted, and assuming the Arkansas Department of Transportation (ARDOT) is among the agencies contacted regarding this project, the Department does not have any specific objections at this time.

It is reminded, if the construction site will disturb in excess of one (1) acre, the permittee must comply with the terms of the Stormwater Construction General Permit ARR150000 prior to the start of construction. The ARR150000 does not authorize any activity to be conducted in Waters of the State or Waters of the United States. Any work being conducted in Waters of the State will require a Short Term Activity Authorization (STAA) from ADEQ in accordance with Regulation 2.305. A STAA is necessary for any in-stream activity that may cause an exceedance of applicable water quality standards, including, but not limited to: gravel removal, bridge or crossing repair/maintenance, bank stabilization, debris removal, culvert replacement, flood control projects, and stream relocation. Any work being conducted in Waters of the United States may require a Section 404 permit from the U.S. Army Corps of Engineers. All applicable State and Federal laws must be met before, during and after completion of the project.

This letter is issued in reliance upon the statements and representations made in the submittal and the Department has no responsibility for adequacy or proper functioning of the proposed project. If there are further questions, please contact the Permits Branch at 501-682-0623.

Sincerely,

Bryan Leamons, P.E.
Senior Operations Manager, Office of Water Quality

BL:tl

cc: Audree Miller, Pollution Prevention Coordinator, Office of Law and Policy

Arkansas Department of Health

4815 West Markham Street • Little Rock, Arkansas 72205-3867 • Telephone (501) 661-2000
Governor Asa Hutchinson
Nathaniel Smith, MD, MPH, Director and State Health Officer

June 6, 2018

Bill McAbee
Garver, LLC
4701 Northshore Drive
North Little Rock, AR 72118

RE: Arkadelphia Bypass from Hwy. 67 to Hwy. 51/8
Arkadelphia, Clark County, Arkansas
ARDOT Job No. 070442, Hwy. 67-Hwy. 51 (Arkadelphia Bypass) P.E.

Dear Mr. McAbee,

A staff review has been made of the information received on the following project:

ARDOT Project	ADH Number	Permit Name	County
070442	32-7846	ARKADELPHIA BYPASS HWY 67 TO HWY 51/8	CLARK

The Engineering Section has no comments on the submittal.

If you have any questions or comments, please coordinate them through Tyler Couch at (501) 280-4428.

Sincerely,

Lyle Godfrey, P.E.
Chief, Technical Support
Engineering Section

LG:DR:BG:tc

CC: Arkadelphia Waterworks, 700 Clay Street, Arkadelphia, AR 71923

Schmidt, Cassie P.

Subject: RE: Arkadelphia Bypass - possible 6(f)3 conflicts

From: Matt McNair <matt.mcnair@arkansas.gov>
Date: July 20, 2018 at 3:57:01 PM MDT
To: "McAbee, William C." <WCMcAbee@GarverUSA.com>
Subject: Arkadelphia Bypass - possible 6(f)3 conflicts

Howdy, Bill. Please find attached a very rough (re: kind of crummy) illustration highlighting possible 6(f)3 conflicts with regard to the upcoming Arkadelphia Bypass project.

My notations didn't show up all that well, but it appears to me the two main concerns will be, depending upon the ultimate project area, Feaster Park and River Park. Feaster Park is just west-southwest of Henderson State, and River Park is sited where Hwy 67 hooks north and into town from the southwest. It's down there by the railroad depot.

Both of these parks have LWCF funding in them, and are encumbered under Section 6(f)3 of the LWCF Act. As you can see, there are a two other parks that might be affected (Arkadelphia Central Park and Ouachita River Baseball Park), but to the best of my knowledge, they are not under 6(f)3 encumbrance.

Please accept my apology for the poor quality of this map and the thumbnail-sketch nature of this response; fieldwork has kept me out of the office of late, and promises to keep me out more often than not for a couple more weeks. I just wanted to touch base and give you a general idea of what conflicts might arise. I'll be back in the office more or less regularly starting the week of August 13th; if you need anything in the meantime, shoot me an email and I'll get back to you just as soon as I can.

Cheers,

Matt McNair
Project Officer / Environmental Review Coordinator
Arkansas Dept. of Parks & Tourism, Outdoor Recreation Grants Program
1 Capitol Mall, Little Rock, AR 72201
501.682.1227
matt.mcnair@arkansas.gov

Grant Management with Web AppBuilder for ArcGIS Outdoor Gr

Pat Fitts
Director

Caroline Cone
Chief of Staff and
Deputy Director

Chris Colclasure
Deputy Director

Chris Racey
Deputy Director

Arkansas Game and Fish Commission

July 20, 2018

Bill McAbee
Garver, LLC
4701 Northshore Drive
North Little Rock, Arkansas 72118

Re: Arkadelphia Bypass from Hwy. 67 to Hwy. 51/8-West Alignment
Arkadelphia, Clark County Arkansas
ARDOT Job No. 070442, Hwy. 67-Hwy. 51 (Arkadelphia Bypass) P.E.
Request for Information-Additional Study Area

Mr. McAbee,

Biologists with the Arkansas Fish and Game Commission (AGFC) have reviewed the west alignment additional study area for the Arkadelphia bypass for potential impacts to fish and wildlife resources of the state. This route should have minimal impacts to known populations of Species of Greatest Conservation Need, however, this project does fall within the consultation zone for Northern Long Eared Bat. Any tree clearing that occurs should happen only after consultation with the United States Fish and Wildlife Service. Any impacts to jurisdictional waters of the United States should be mitigated appropriately, at an approved mitigation bank adhering to the 2008 compensatory mitigation rule.

The AGFC appreciates the opportunity to review this proposed project. Should there be additional questions of the agency, please don't hesitate to contact me. Thanks.

Sincerely,

Justin Stroman

Justin Stroman
Environmental Coordination Biologist

THE DEPARTMENT OF ARKANSAS
HERITAGE

Asa Hutchinson
Governor

Stacy Hurst
Director

Arkansas Arts Council

Arkansas Natural
Heritage Commission

Arkansas State Archives

Delta Cultural Center

Historic Arkansas Museum

Mosaic Templars
Cultural Center

Old State House Museum

ARKANSAS HISTORIC
PRESERVATION PROGRAM

1100 North Street
Little Rock, AR 72201

(501) 324-9880
fax: (501) 324-9184
tdd: 711

e-mail:
info@arkansaspreservation.org
website:
www.arkansaspreservation.com

An Equal Opportunity Employer

May 14, 2018

Mr. Bill McAbee
Garver USA
4701 Northshore Drive
North Little Rock, AR 72118

RE: Clark – Arkadelphia
Section 106 Review – FHWA
Arkadelphia Bypass from Hwy. 67 to Hwy 51/8
ARDOT Job No. 070442
Hwy. 67 – Hwy. 51 (Arkadelphia Bypass) P.E.
AHPP Tracking Number: 101106

Dear Mr. McAbee:

This letter is in response to your inquiry regarding properties of archeological, historical, or architectural significance in the area of the proposed referenced project. The staff of the Arkansas Historic Preservation Program (AHPP) has reviewed records pertaining to the area in question.

A records check found several previously recorded archeological sites in the general area of this undertaking. The Arkansas 7/51 Bridge-CL0950 and Missouri Pacific Railroad Depot-CL0193 are listed in the National Register of Historic Places (NRHP) while the Ouachita River Railroad Bridge-CL0121 is eligible for listing. In addition, there are numerous historic structures in the proposed study area that have not been evaluated for eligibility for listing in the NRHP. Because so little work has been undertaken in the proposed study area previously, we recommend that a cultural resources survey be conducted in the area of potential effect (APE).

Tribes that have expressed an interest in the area include the Caddo Nation (Ms. Tamara Francis), the Chickasaw Nation (Ms. Karen Brunso), the Choctaw Nation of Oklahoma (Dr. Ian Thompson), the Osage Nation (Dr. Andrea Hunter), the Quapaw Tribe of Oklahoma (Mr. Everett Bandy), and the Shawnee Tribe of Oklahoma (Ms. Kim Jumper). We recommend that they be consulted in accordance with 36 CFR § 800.2 (c) (2).

Thank you for the opportunity to review this undertaking. Once the undertaking is further along in the planning stages, we look forward to reviewing the updated information. If you should have any questions or comments, please do not hesitate to contact Theresa Russell of my staff at (501)-324-9357.

Sincerely,

Scott Kaufman
Director, AHPP

cc: Dr. Andrea Hunter, Osage Nation
Dr. Ann Early, Arkansas Archeological Survey

THE DEPARTMENT OF ARKANSAS HERITAGE

Asa Hutchinson
Governor

Stacy Hurst
Director

Arkansas Arts Council
•
Arkansas Historic Preservation Program
•
Arkansas State Archives
•
Delta Cultural Center
•
Historic Arkansas Museum
•
Mosaic Templars Cultural Center
•
Old State House Museum

ARKANSAS NATURAL HERITAGE COMMISSION

1100 North Street
Little Rock, AR 72201

(501) 324-9619
fax: (501) 324-9618
tdd: 711

e-mail:
info@naturalheritage.com
website:
www.naturalheritage.com

An Equal Opportunity Employer

Date: June 12, 2018
Subject: Arkadelphia Bypass from Hwy. 67 to Hwy. 51/8
Arkadelphia, Clark County, Arkansas
ANHC No.: P-CF..-18-053

Mr. Bill McAbee
Garver, LLC
4701 Northshore Drive
North Little Rock, AR 72118

Dear Mr. McAbee:

Staff members of the Arkansas Natural Heritage Commission have reviewed our files for records indicating the occurrence of rare plants and animals, outstanding natural communities, natural or scenic rivers, or other elements of special concern within or near the study area for the Arkadelphia Bypass project from Highway 67 to Highway 51/8. The results of this review are provided as a Geographic Information System (GIS) layer file. Documentation is provided to help you interpret the information in this file.

Our records indicate the potential occurrence of the following species within or near (a one-mile radius of) the project area:

Anguilla rostrata, American eel - State Concern
Arcidens wheeleri, Ouachita Rock Pocketbook - Federal Concern (endangered)
Crystallaria asprella, crystal darter - State Concern
Cyprogenia sp. cf aberti, Ouachita Fanshell - State Concern
Hiodon tergisus, mooneye - State Concern
Lampsilis abrupta, Pink Mucket - Federal Concern (endangered)
Liodytes rigida, Glossy Swampsnake - State Concern
Mugil cephalus, striped mullet - State Concern
Nicrophorus americanus, American burying beetle - Federal Concern (endangered)
Percina vigil, saddleback darter - State Concern
Pleurobema sintoxia, Round Pigtoe - State Concern
Ptychobranchus occidentalis, Ouachita Kidneyshell - State Concern
Theliderma cylindrica, Rabbitsfoot - Federal Concern (threatened)
Toxolasma texasiense, Texas Lilliput - State Concern
Villosa lienosa, little spectaclecase - State Concern

Most of these species were reported from the Ouachita River. Many of these records are older observations. We do not know the current status of these species in this reach of the river. It is of note, that four of the above

species are of federal concern. Coordination with the U.S. Fish and Wildlife Service would be appropriate.

A Clark County Element list is enclosed for your reference. Represented on this list are elements for which we have records in our database. The list has been annotated to indicate those elements known to occur within a one and a five-mile radius of the project site. A legend is enclosed to help you interpret the codes used on this list.

Please keep in mind that the project area may contain important natural features of which we are unaware. Staff members of the Arkansas Natural Heritage Commission have not conducted a field survey of the study site. Our review is based on data available to the program at the time of the request. It should not be regarded as a final statement on the elements or areas under consideration. Because our files are updated constantly, you may want to check with us again at a later time.

Thank you for consulting us. It has been a pleasure to work with you on this study.

Sincerely,

Cindy Osborne

Cindy Osborne
Data Manager/Environmental Review Coordinator

Enclosures: GIS Layer file (ANHCDATA)
Clark County Element List (annotated)
Legend
Invoice

THE DEPARTMENT OF ARKANSAS HERITAGE

Asa Hutchinson
Governor

Stacy Hurst
Director

Arkansas Arts Council

Arkansas Historic Preservation Program

Arkansas State Archives

Delta Cultural Center

Historic Arkansas Museum

Mosaic Templars Cultural Center

Old State House Museum

ARKANSAS NATURAL HERITAGE COMMISSION

1100 North Street
Little Rock, AR 72201

(501) 324-9619
fax: (501) 324-9618
tdd: 711

e-mail:
info@naturalheritage.com
website:
www.naturalheritage.com

An Equal Opportunity Employer

Date: July 24, 2018
Subject: Elements of Special Concern
Arkadelphia Bypass-West Alignment
ARDOT Job No.: 070442
Clark County, Arkansas
ANHC No.: P-CF..-18-065

Mr. Bill McAbee
Garver
4701 Northshore Drive
North Little Rock, AR 72118

Dear Mr. McAbee:

Staff members of the Arkansas Natural Heritage Commission have reviewed our files for records indicating the occurrence of rare plants and animals, outstanding natural communities, natural or scenic rivers, or other elements of special concern within or near the following site:

Project Name	County	Quad. Name	Location
Arkadelphia Bypass West	Clark	Arkadelphia 7.5'	T17S/R19W/S19,20 T17S/R20W/S24

We find no records at present time.

A Clark County Element List is enclosed. Represented on this list are elements for which we have records in our database. The list has been annotated to indicate those elements known to occur within a one and a five mile radius of the project site. A legend is enclosed to help you interpret the codes used on this list.

Please keep in mind that the project area may contain important natural features of which we are unaware. Staff members of the Arkansas Natural Heritage Commission have not conducted a field survey of the study site. Our review is based on data available to the program at the time of the request. It should not be regarded as a final statement on the elements or areas under consideration. Because our files are updated constantly, you may want to check with us again at a later time.

Thank you for consulting us. It has been a pleasure to work with you on this study.

Sincerely,

Katie Shannon
for

Cindy Osborne
Data Manager/Environmental Review Coordinator

Enclosures: Legend
Clark County Element List (annotated)
Invoice

6/12/2018

Arkansas Natural Heritage Commission
Department of Arkansas Heritage
Elements of Special Concern
Clark County

	Scientific Name	Common Name	Federal Status	State Status	Global Rank	State Rank
	Animals-Invertebrates					
✓	*Alasmidonta marginata*	Elktoe	-	INV	G4	S3
	Amblyscirtes belli	Bell's Roadside-Skipper	-	INV	G3G4	S3S4
✓	*Arcidens wheeleri*	Ouachita Rock Pocketbook	LE	SE	G1	S1
	Atrytonopsis hianna	Dusted Skipper	-	INV	G4G5	S2S3
	Beameria venosa	A concealed-tymbal Cicada	-	INV	GNR	S1S2
	Chlosyne gorgone	Gorgone Checkerspot	-	INV	G5	S3
✓	*Cumberlandia monodonta*	Spectaclecase	LE	SE	G3	S2
✓	*Cyprogenia sp. cf aberti*	Ouachita Fanshell	-	INV	GNR	S3
	Euphyes dukesi	Dukes' Skipper	-	INV	G3	S1S2
	Fallicambarus jeanae	Daisie burrowing crayfish	-	INV	G2	S2
	Faxonius menae	Mena crayfish	-	INV	G3	S3
✓	*Lampsilis abrupta*	Pink Mucket	LE	SE	G2	S2
✓	*Lampsilis ornata*	Southern Pocketbook	-	INV	G5	S2
✓	*Lampsilis powellii*	Arkansas Fatmucket	LT	SE	G2	S2
	Lethe creola	Creole Pearly-Eye	-	INV	G3G4	S3
	Microstylum morosum	giant prairie robber fly	-	INV	G3G4	S1
✓	*Nicrophorus americanus*	American burying beetle	LE	SE	G2G3	S1
✓	*Obovaria olivaria*	Hickorynut	-	INV	G4	S3
✓	*Pleurobema rubrum*	Pyramid Pigtoe	-	INV	G2G3	S2
✓	*Pleurobema sintoxia*	Round Pigtoe	-	INV	G4G5	S3
	Poanes yehl	Yehl Skipper	-	INV	G4	S1S3
	Problema byssus	Byssus Skipper	-	INV	G3G4	S3
✓	*Procambarus parasimulans*	Bismark burrowing crayfish	-	INV	G4	S3
✓	*Ptychobranchus occidentalis*	Ouachita Kidneyshell	-	INV	G3G4	S3
	Quadrula fragosa	Winged Mapleleaf	LE	SE	G1	S1
	Quadrula nobilis	Gulf Mapleleaf	-	INV	G4	S3
✓	*Somatogyrus amnicoloides*	Ouachita pebblesnail	-	INV	GX	SX
✓	*Somatogyrus wheeleri*	channelled pebblesnail	-	INV	GX	SX
	Speyeria diana	Diana Fritillary	-	INV	G3G4	S2S3
	Tetraloniella albata	white long-horned bee	-	INV	GNR	S1
✓	*Theliderma cylindrica*	Rabbitsfoot	LT	SE	G3G4	S3
	Toxolasma lividum	Purple Lilliput	-	INV	G3Q	S3
	Toxolasma parvum	Lilliput	-	INV	G5	S3
✓	*Toxolasma texasiense*	Texas Lilliput	-	INV	G4	S3
✓	*Villosa lienosa*	little spectaclecase	-	INV	G5	S3
	Animals-Vertebrates					
✓	*Alosa alabamae*	Alabama shad	-	INV	G2G3	S1
✓	*Ambystoma talpoideum*	Mole Salamander	-	INV	G5	S3
✓	*Anguilla rostrata*	American eel	-	INV	G4	S3
✓	*Carphophis amoenus*	Common Wormsnake	-	INV	G5	S2
*	*Corynorhinus rafinesquii*	Rafinesque's big-eared bat	-	INV	G3G4	S3
✓	*Crystallaria asprella*	crystal darter	-	INV	G3	S2
	Erimyzon sucetta	lake chubsucker	-	INV	G5	S3
	Etheostoma clinton	beaded darter	-	INV	GNR	S2
✓	*Etheostoma parvipinne*	goldstripe darter	-	INV	G4G5	S3

Clark Co. (cont.)

	Scientific Name	Common Name	Federal Status	State Status	Global Rank	State Rank
	Eurycea paludicola	Western Dwarf Salamander	-	INV	GNR	S3
	Haliaeetus leucocephalus	Bald Eagle	-	INV	G5	S3B,S4N
	Hemidactylium scutatum	Four-toed Salamander	-	INV	G5	S2
✓	*Hiodon alosoides*	goldeye	-	INV	G5	S2
✓	*Hiodon tergisus*	mooneye	-	INV	G5	S2
✓	*Hyla avivoca*	Bird-voiced Treefrog	-	INV	G5	S3
	Lethenteron appendix	American brook lamprey	-	INV	G4	S3
✓	*Liodytes rigida*	Glossy Swampsnake	-	INV	G5	S3
✓	*Mugil cephalus*	striped mullet	-	INV	G5	S2
	Myotis austroriparius	southeastern bat	-	INV	G4	S3
	Myotis septentrionalis	northern long-eared bat	LT	SE	G1G2	S1S2
	Notropis ortenburgeri	Kiamichi shiner	-	INV	G3	S3
✓	*Notropis perpallidus*	peppered shiner	-	INV	G3	S3
✓	*Noturus taylori*	Caddo madtom	-	INV	G1	S1
	Ophisaurus attenuatus	Slender Glass Lizard	-	INV	G5	S3
✓	*Percina brucethompsoni*	Ouachita darter	-	INV	G2?	S2
✓	*Percina uranidea*	stargazing darter	-	INV	G3	S2
✓	*Percina vigil*	saddleback darter	-	INV	G5	S3
	Picoides borealis	Red-cockaded Woodpecker	LE	SE	G3	S1
✓	*Polyodon spathula*	paddlefish	-	INV	G4	S3
✓	*Porphyrio martinicus*	Purple Gallinule	-	INV	G5	S1B
✓	*Pteronotropis hubbsi*	bluehead shiner	-	INV	G3	S3
	Plants-Vascular					
	Agalinis auriculata	ear-leaf false foxglove	-	INV	G3	S1
✓	*Amsonia hubrichtii*	Ouachita bluestar	-	INV	G3	S3
✓	*Astragalus crassicarpus var. crassicarpus*	purple ground-plum	-	INV	G5T5	S2
	Carex decomposita	cypress-knee sedge	-	INV	G3G4	S2
	Cirsium engelmannii	Engelmann's thistle	-	INV	G4	S1
	Cypripedium kentuckiense	Kentucky lady's-slipper	-	INV	G3	S3
	Diaperia prolifera var. prolifera	big-head rabbit-tobacco	-	INV	G5TNR	S1S3
✓	*Fuirena simplex var. aristulata*	western umbrella sedge	-	INV	G5T4	S1
✓	*Glandularia bipinnatifida var. bipinnatifida*	Dakota vervain	-	INV	G5T5	S2
	Liatris squarrosa var. squarrosa	hairy scaly blazing-star	-	INV	G5T5	S1
	Lithospermum incisum	fringed puccoon	-	INV	G5	S2S3
	Lithospermum tuberosum	tuberous puccoon	-	INV	G4	S2
✓	*Lycopodiella prostrata*	prostrate bog club-moss	-	INV	G5	S1
	Minuartia drummondii	Drummond's sandwort	-	INV	G5	S2S3
	Nemastylis geminiflora	celestial-lily	-	INV	G4	S3
✓	*Physaria gracilis ssp. gracilis*	slender bladderpod	-	INV	G5T4	S1
✓	*Plantago rhodosperma*	red-seed plantain	-	INV	GNR	S1S2
✓	*Pseudolycopodiella caroliniana*	slender bog club-moss	-	INV	G4	S1
	Psilotum nudum	whisk fern	-	INV	G5	S1?
✓	*Pyrrhopappus pauciflorus*	few-flower false dandelion	-	INV	G5	S1S2
	Ranunculus flabellaris	yellow water crowfoot	-	INV	G5	S3
	Scleria verticillata	whorled nut-rush	-	ST	G5	S1
	Solidago tortifolia	twist-leaf goldenrod	-	INV	G4G5	S2
✓	*Spiranthes magnicamporum*	Great Plains ladies'-tresses	-	INV	G3G4	S1S2
	Spiranthes odorata	fragrant ladies'-tresses	-	INV	G5	S1
	Spiranthes ovalis var. erostellata	northern oval ladies'-tresses	-	INV	G5?T4?	S1

Clark Co. (cont.)

	Scientific Name	Common Name	Federal Status	State Status	Global Rank	State Rank
	Spiranthes praecox	giant ladies'-tresses	-	INV	G5	S1S2
	Stenosiphon linifolius	false gaura	-	ST	G5	S1
	Trichomanes petersii	dwarf bristle fern	-	ST	G4G5	S2
	Utricularia inflata	swollen bladderwort	-	INV	G5	S1
	Vernonia lettermannii	Letterman's ironweed	-	INV	G3	S3
	Viola walteri	Walter's violet	-	INV	G4G5	S1S2
	Xyris difformis var. difformis	bog yellow-eyed-grass	-	INV	G5T5	S2
	Special Elements-Natural Communities					
	Juniper-Hardwood Woodland		-	INV	GNR	S4
	Lowland Pine-Oak Forest		-	INV	GNR	S1
	South Central Saline Glade		-	INV	GNR	SNR
✓	West Gulf Coastal Plain Northern Calcareous Prairie		-	INV	GNR	SNR
	Special Elements-Other					
	Colonial nesting site, water birds		-	INV	GNR	SNR

***-This element of special concern has been recorded within one mile of the Arkadelphia Bypass-West Alignment.**

✓-These elements of special concern have been recorded within five miles of the Arkadelphia Bypass-West Alignment.

LEGEND

STATUS CODES

FEDERAL STATUS CODES

C = Candidate species. The U.S. Fish and Wildlife Service has enough scientific information to warrant proposing this species for listing as endangered or threatened under the Endangered Species Act.

LE = Listed Endangered; the U.S. Fish and Wildlife Service has listed this species as endangered under the Endangered Species Act.

LT = Listed Threatened; the U.S. Fish and Wildlife Service has listed this species as threatened under the Endangered Species Act.

-PD = Proposed for Delisting; the U.S. Fish and Wildlife Service has proposed that this species be removed from the list of Endangered or Threatened Species.

PE = Proposed Endangered; the U.S. Fish and Wildlife Service has proposed this species for listing as endangered.

PT = Proposed Threatened; the U.S. Fish and Wildlife Service has proposed this species for listing as threatened.

T/SA = Threatened (or Endangered) because of similarity of appearance.
E/SA

STATE STATUS CODES

INV = Inventory Element; The Arkansas Natural Heritage Commission is currently conducting active inventory work on these elements. Available data suggests these elements are of conservation concern. These elements may include outstanding examples of Natural Communities, colonial bird nesting sites, outstanding scenic and geologic features as well as plants and animals, which, according to current information, may be rare, peripheral, or of an undetermined status in the state. The ANHC is gathering detailed location information on these elements.

WAT = Watch List Species; The Arkansas Natural Heritage Commission is not conducting active inventory work on these species, however, available information suggests they may be of conservation concern. The ANHC is gathering general information on status and trends of these elements. An "*" indicates the status of the species will be changed to "INV" if the species is verified as occurring in the state (this typically means the agency has received a verified breeding record for the species).

MON = Monitored Species; The Arkansas Natural Heritage Commission is currently monitoring information on these species. These species do not have conservation concerns at present. They may be new species to the state, or species on which additional information is needed. The ANHC is gathering detailed location information on these elememts

SE = State Endangered; this term is applied differently for plants and animals.

Animals – These species are afforded protection under Arkansas Game and Fish Commission (AGFC) Regulation. The AGFC states that it is unlawful to import, transport, sell, purchase, hunt, harass or possess any threatened or endangered species of wildlife or parts. The AGFC lists as endangered any wildlife species or subspecies endangered or threatened with extinction, listed or proposed as a candidate for listing by the U.S. Fish and Wildlife Service or any native species or subspecies listed as endangered by the Commission.

Plants – These species have been recognized by the Arkansas Natural Heritage Commission as being in danger of being extirpated from the state. This is an administrative designation with no regulatory authority.

ST = State Threatened; These species have been recognized by the Arkansas Natural Heritage Commission as being likely to become endangered in Arkansas in the foreseeable future, based on current inventory information. This is an administrative designation with no regulatory authority.

DEFINITION OF RANKS

Global Ranks

G1 = Critically imperiled globally. At a very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.

G2 = Imperiled globally. At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.

G3 = Vulnerable globally. At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.

G4 = Apparently secure globally. Uncommon but not rare; some cause for long-term concern due to declines or other factors.

G5 = Secure globally. Common, widespread and abundant.

GH = Of historical occurrence, possibly extinct globally. Missing; known from only historical occurrences, but still some hope of rediscovery.

GU = Unrankable. Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

GX = Presumed extinct globally. Not located despite intensive searches and virtually no likelihood of rediscovery.

GNR = Unranked. The global rank not yet assessed.

GNA = Not Applicable. A conservation status rank is not applicable.

T-RANKS= T subranks are given to global ranks when a subspecies, variety, or race is considered at the state level. The subrank is made up of a "T" plus a number or letter (1, 2, 3, 4, 5, H, U, X) with the same ranking rules as a full species.

State Ranks

S1 = Critically imperiled in the state due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors making it vulnerable to extirpation.

S2 = Imperiled in the state due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it vulnerable to extirpation.

S3 = Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

S4 = Apparently secure in the state. Uncommon but not rare; some cause for long-term concern due to declines or other factors.

S5 = Secure in the state. Common, widespread and abundant.

SH = Of historical occurrence, with some possibility of rediscovery. Its presence may not have been verified in the past 20-40 years. A species may be assigned this rank without the 20-40 year delay if the only known occurrences were destroyed or if it had been extensively and unsuccessfully sought.

SU = Unrankable. Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

SX = Presumed extirpated from the state. Not located despite intensive searches and virtually no likelihood of rediscovery.

SNR = Unranked. The state rank not yet assessed.

SNA = Not Applicable. A conservation status rank is not applicable.

General Ranking Notes

Q = A "Q" in the global rank indicates the element's taxonomic classification as a species is a matter of conjecture among scientists.

RANGES= Ranges are used to indicate a range of uncertainty about the status of the element.

? = A question mark is used to denote an inexact numeric rank.

B = Refers to the breeding population of a species in the state.

N = Refers to the non-breeding population of a species in the state.

United States Department of Agriculture

May 30, 2018

Garver, LLC
4701 Northshore Drive
North Little Rock, AR 72118

Subject: Farmland Conversion Impact Rating
Garver, LLC
ARDOT Job No. 070442 Hwy 67-Hwy 51

Dear Bill McAbee

This letter is in response to your request for information related to Prime Farmland and Farmland of Statewide Importance for the proposed Arkadelphia Bypass from Hwy 67 to Hwy 51/8 in Clark County, Arkansas. Some areas in the proposed area are considered Prime Farmland or Farmland of Statewide Importance, as showed on the attached maps.

Should you have any questions or need additional information, please call me at (870) 345-3347 or email at marie.ross@ar.usda.gov .

Sincerely,

Marie Ross
Resource Soil Scientist
USDA-Natural Resources Conservation Service
640 South 6th Street
Arkadelphia AR 71923
870-345-3347

Enclosures:
Form AD-1006
Farmland Classification Map

cc.
Edgar Mersiovsky, NRCS, State Soil Scientist, Little Rock, AR

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request May 25, 2018
Name of Project Arkadelphia Bypass ARDOT 070442	Federal Agency Involved
Proposed Land Use construct bypass road	County and State Clark County, AR
PART II *(To be completed by NRCS)*	Date Request Received By NRCS May 10, 2018 / Person Completing Form: Marie Ross

Does the site contain Prime, Unique, Statewide or Local Important Farmland? *(If no, the FPPA does not apply - do not complete additional parts of this form)*	YES ☑ NO ☐	Acres Irrigated 278,293	Average Farm Size 777
Major Crop(s) soybeans	Farmable Land In Govt. Jurisdiction Acres: 118739 % 21	Amount of Farmland As Defined in FPPA Acres: 11873 % 21	
Name of Land Evaluation System Used SCS LESA	Name of State or Local Site Assessment System Arkansas	Date Land Evaluation Returned by NRCS	

PART III *(To be completed by Federal Agency)*	Alternative Site Rating			
	Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	635.6			
B. Total Acres To Be Converted Indirectly	0			
C. Total Acres In Site	635.6			
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland	376			
B. Total Acres Statewide Important or Local Important Farmland	0			
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted	0.3			
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value	100			
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)	25.9			

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)*	Maximum Points	Site A	Site B	Site C	Site D
1. Area In Non-urban Use	(15)				
2. Perimeter In Non-urban Use	(10)				
3. Percent Of Site Being Farmed	(20)				
4. Protection Provided By State and Local Government	(20)				
5. Distance From Urban Built-up Area	(15)				
6. Distance To Urban Support Services	(15)				
7. Size Of Present Farm Unit Compared To Average	(10)				
8. Creation Of Non-farmable Farmland	(10)				
9. Availability Of Farm Support Services	(5)				
10. On-Farm Investments	(20)				
11. Effects Of Conversion On Farm Support Services	(10)				
12. Compatibility With Existing Agricultural Use	(10)				
TOTAL SITE ASSESSMENT POINTS	160	0	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100	25.9	0	0	0
Total Site Assessment *(From Part VI above or local site assessment)*	160	0	0	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	25.9	0	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? YES ☐ NO ☐

Reason For Selection:

Name of Federal agency representative completing this form: Natural Resources Conservaton Service | Date: 5/25/2018

(See Instructions on reverse side)

Form AD-1006 (03-02)

STEPS IN THE PROCESSING THE FARMLAND AND CONVERSION IMPACT RATING FORM

Step 1 - Federal agencies (or Federally funded projects) involved in proposed projects that may convert farmland, as defined in the Farmland Protection Policy Act (FPPA) to nonagricultural uses, will initially complete Parts I and III of the form. For Corridor type projects, the Federal agency shall use form NRCS-CPA-106 in place of form AD-1006. The Land Evaluation and Site Assessment (LESA) process may also be accessed by visiting the FPPA website, http://fppa.nrcs.usda.gov/lesa/.

Step 2 - Originator (Federal Agency) will send one original copy of the form together with appropriate scaled maps indicating location(s)of project site(s), to the Natural Resources Conservation Service (NRCS) local Field Office or USDA Service Center and retain a copy for their files. (NRCS has offices in most counties in the U.S. The USDA Office Information Locator may be found at http://offices.usda.gov/scripts/ndISAPI.dll/oip_public/USA_map, or the offices can usually be found in the Phone Book under U.S. Government, Department of Agriculture. A list of field offices is available from the NRCS State Conservationist and State Office in each State.)

Step 3 - NRCS will, within 10 working days after receipt of the completed form, make a determination as to whether the site(s) of the proposed project contains prime, unique, statewide or local important farmland. (When a site visit or land evaluation system design is needed, NRCS will respond within 30 working days.

Step 4 - For sites where farmland covered by the FPPA will be converted by the proposed project, NRCS will complete Parts II, IV and V of the form.

Step 5 - NRCS will return the original copy of the form to the Federal agency involved in the project, and retain a file copy for NRCS records.

Step 6 - The Federal agency involved in the proposed project will complete Parts VI and VII of the form and return the form with the final selected site to the servicing NRCS office.

Step 7 - The Federal agency providing financial or technical assistance to the proposed project will make a determination as to whether the proposed conversion is consistent with the FPPA.

INSTRUCTIONS FOR COMPLETING THE FARMLAND CONVERSION IMPACT RATING FORM

(For Federal Agency)

Part I: When completing the "County and State" questions, list all the local governments that are responsible for local land use controls where site(s) are to be evaluated.

Part III: When completing item B (Total Acres To Be Converted Indirectly), include the following:

1. Acres not being directly converted but that would no longer be capable of being farmed after the conversion, because the conversion would restrict access to them or other major change in the ability to use the land for agriculture.
2. Acres planned to receive services from an infrastructure project as indicated in the project justification (e.g. highways, utilities planned build out capacity) that will cause a direct conversion.

Part VI: Do not complete Part VI using the standard format if a State or Local site assessment is used. With local and NRCS assistance, use the local Land Evaluation and Site Assessment (LESA).

1. Assign the maximum points for each site assessment criterion as shown in § 658.5(b) of CFR. In cases of corridor-type project such as transportation, power line and flood control, criteria #5 and #6 will not apply and will, be weighted zero, however, criterion #8 will be weighed a maximum of 25 points and criterion #11 a maximum of 25 points.

2. Federal agencies may assign relative weights among the 12 site assessment criteria other than those shown on the FPPA rule after submitting individual agency FPPA policy for review and comment to NRCS. In all cases where other weights are assigned, relative adjustments must be made to maintain the maximum total points at 160. For project sites where the total points equal or exceed 160, consider alternative actions, as appropriate, that could reduce adverse impacts (e.g. Alternative Sites, Modifications or Mitigation).

Part VII: In computing the "Total Site Assessment Points" where a State or local site assessment is used and the total maximum number of points is other than 160, convert the site assessment points to a base of 160.
Example: if the Site Assessment maximum is 200 points, and the alternative Site "A" is rated 180 points:

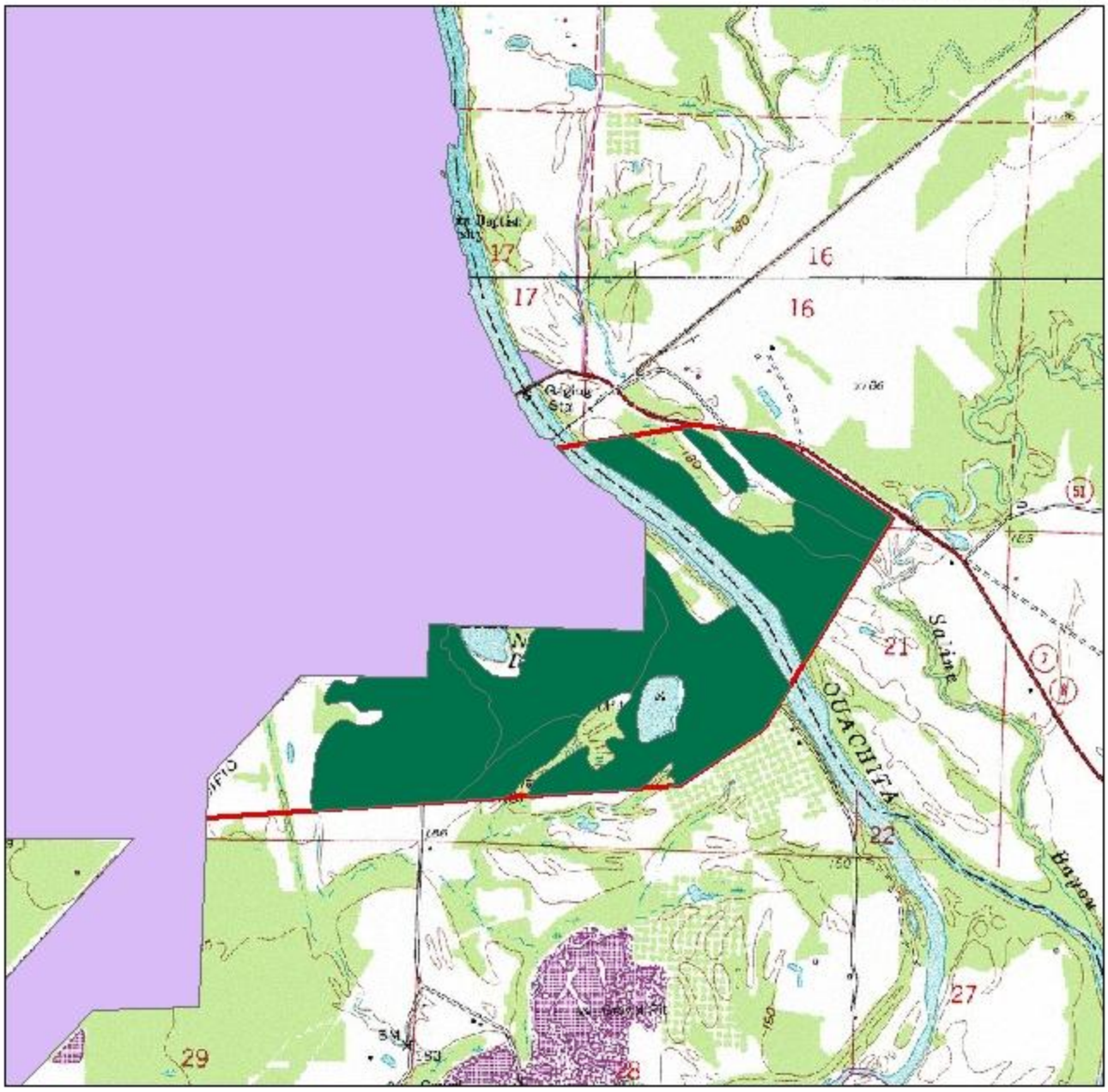
$$\frac{\text{Total points assigned Site A}}{\text{Maximum points possible}} = \frac{180}{200} \times 160 = 144 \text{ points for Site A}$$

For assistance in completing this form or FPPA process, contact the local NRCS Field Office or USDA Service Center.

NRCS employees, consult the FPPA Manual and/or policy for additional instructions to complete the AD-1006 form.

Farmland Classification
Arkadelphia Bypass from Hwy67 to Hwy 51/8
ARDOT Job No. 070442
Clark County, AR

Assisted by: Marie Ross, RSS
Natural Resources Conservation Service
Arkadelphia Field Office



Legend

1:24,000

May 2018

City Limit

Farmland Classification

All areas are prime farmland

United States Department of Agriculture

August 3, 2018

Garver, LLC
4701 Northshore Drive
North Little Rock, AR 72118
Attn: Bill McAbee

Subject: FormsAD106
Farmland Conversion Impact Rating
ARDot Job 070442 Hwy 67-Hwy 51 P.E
Arkadelphia West Bypass
Clark County, AR

Dear Mr. Bill McAbee

This letter is in response to your request for information related to Prime Farmland and Farmland of Statewide Importance for the proposed Arkadelphia West Bypass located in Clark County, Arkansas. Some areas in the proposed area are considered Prime Farmland or Farmland of Statewide Importance, as showed on the attached maps.

Should you have any questions or need additional information, please call me at (870) 345-3347 or email at marie.ross@ar.usda.gov

Sincerely,

Marie Ross
Resource Soil Scientist
USDA-Natural Resources Conservation Service
640 South 6th Street
Arkadelphia AR 71923
870-345-3347

cc
Edgar Mersiovsky, Arkansas State Soil Scientist, Little Rock, AR

U.S. DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service

NRCS-CPA-106
(Rev. 1-91)

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

PART I *(To be completed by Federal Agency)*	3. Date of Land Evaluation Request 7/9/18	4. Sheet 1 of 1
1. Name of Project Arkadelphia West Bypass ARDOT 070422	5. Federal Agency Involved	
2. Type of Project	6. County and State Clark County, AR	

PART II *(To be completed by NRCS)*	1. Date Request Received by NRCS 7/9/18	2. Person Completing Form Marie Ross
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form). YES ☑ NO ☐		4. Acres Irrigated 79 / Average Farm Size 128
5. Major Crop(s) soybeans	6. Farmable Land in Government Jurisdiction Acres: 252,989 % 42.6	7. Amount of Farmland As Defined in FPPA Acres: 252,989 % 42.6
8. Name Of Land Evaluation System Used SCS/LESA	9. Name of Local Site Assessment System Arkansas	10. Date Land Evaluation Returned by NRCS 7/31/18

PART III *(To be completed by Federal Agency)*	Alternative Corridor For Segment ____			
	Corridor A	**Corridor B**	**Corridor C**	**Corridor D**
A. Total Acres To Be Converted Directly	36.87			
B. Total Acres To Be Converted Indirectly, Or To Receive Services	0			
C. Total Acres In Corridor	36.87			
PART IV *(To be completed by NRCS) Land Evaluation Information*				
A. Total Acres Prime And Unique Farmland	20.6			
B. Total Acres Statewide And Local Important Farmland	0			
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted	0.0042			
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value	100			
PART V *(To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)*	49.2			

PART VI *(To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))*	**Maximum Points**				
1. Area in Nonurban Use	15				
2. Perimeter in Nonurban Use	10				
3. Percent Of Corridor Being Farmed	20				
4. Protection Provided By State And Local Government	20				
5. Size of Present Farm Unit Compared To Average	10				
6. Creation Of Nonfarmable Farmland	25				
7. Availablility Of Farm Support Services	5				
8. On-Farm Investments	20				
9. Effects Of Conversion On Farm Support Services	25				
10. Compatibility With Existing Agricultural Use	10				
TOTAL CORRIDOR ASSESSMENT POINTS	160	0	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland (From Part V)	100	49.2	0	0	0
Total Corridor Assessment (From Part VI above or a local site assessment)	160	0	0	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	49.2	0	0	0

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used? YES ☐ NO ☐

5. Reason For Selection:

Signature of Person Completing this Part: | DATE

NOTE: Complete a form for each segment with more than one Alternate Corridor

Clear Form

CORRIDOR - TYPE SITE ASSESSMENT CRITERIA

The following criteria are to be used for projects that have a linear or corridor - type site configuration connecting two distant points, and crossing several different tracts of land. These include utility lines, highways, railroads, stream improvements, and flood control systems. Federal agencies are to assess the suitability of each corridor - type site or design alternative for protection as farmland along with the land evaluation information.

(1) How much land is in nonurban use within a radius of 1.0 mile from where the project is intended?
More than 90 percent - 15 points
90 to 20 percent - 14 to 1 point(s)
Less than 20 percent - 0 points

(2) How much of the perimeter of the site borders on land in nonurban use?
More than 90 percent - 10 points
90 to 20 percent - 9 to 1 point(s)
Less than 20 percent - 0 points

(3) How much of the site has been farmed (managed for a scheduled harvest or timber activity) more than five of the last 10 years?
More than 90 percent - 20 points
90 to 20 percent - 19 to 1 point(s)
Less than 20 percent - 0 points

(4) Is the site subject to state or unit of local government policies or programs to protect farmland or covered by private programs to protect farmland?
Site is protected - 20 points
Site is not protected - 0 points

(5) Is the farm unit(s) containing the site (before the project) as large as the average - size farming unit in the County ? (Average farm sizes in each county are available from the NRCS field offices in each state. Data are from the latest available Census of Agriculture, Acreage or Farm Units in Operation with $1,000 or more in sales.)
As large or larger - 10 points
Below average - deduct 1 point for each 5 percent below the average, down to 0 points if 50 percent or more below average - 9 to 0 points

(6) If the site is chosen for the project, how much of the remaining land on the farm will become non-farmable because of interference with land patterns?
Acreage equal to more than 25 percent of acres directly converted by the project - 25 points
Acreage equal to between 25 and 5 percent of the acres directly converted by the project - 1 to 24 point(s)
Acreage equal to less than 5 percent of the acres directly converted by the project - 0 points

(7) Does the site have available adequate supply of farm support services and markets, i.e., farm suppliers, equipment dealers, processing and storage facilities and farmer's markets?
All required services are available - 5 points
Some required services are available - 4 to 1 point(s)
No required services are available - 0 points

(8) Does the site have substantial and well-maintained on-farm investments such as barns, other storage building, fruit trees and vines, field terraces, drainage, irrigation, waterways, or other soil and water conservation measures?
High amount of on-farm investment - 20 points
Moderate amount of on-farm investment - 19 to 1 point(s)
No on-farm investment - 0 points

(9) Would the project at this site, by converting farmland to nonagricultural use, reduce the demand for farm support services so as to jeopardize the continued existence of these support services and thus, the viability of the farms remaining in the area?
Substantial reduction in demand for support services if the site is converted - 25 points
Some reduction in demand for support services if the site is converted - 1 to 24 point(s)
No significant reduction in demand for support services if the site is converted - 0 points

(10) Is the kind and intensity of the proposed use of the site sufficiently incompatible with agriculture that it is likely to contribute to the eventual conversion of surrounding farmland to nonagricultural use?
Proposed project is incompatible to existing agricultural use of surrounding farmland - 10 points
Proposed project is tolerable to existing agricultural use of surrounding farmland - 9 to 1 point(s)
Proposed project is fully compatible with existing agricultural use of surrounding farmland - 0 points

Farmland Classification
Arkadelphia Bypass Hwy 67 to Hwy 51/8
West Alignment
Clark County, AR
ArDOT Job No. 070422

Assisted by: Marie Ross, RSS
Arkadelphia Service Center
Date: July 31, 2018

July 2018

1:24,000

United States Department of Agriculture

February 5, 2020

Garver, LLC
4701 Northshore Drive
North Little Rock, AR 72118
Attn: Cassie Schmidt

Subject: Forms AD106
Farmland Conversion Impact Rating
ARDot Job 070422
Clark County, AR

Dear Ms. Schmidt,

This letter is in response to your request for information related to Prime Farmland and Farmland of Statewide Importance for the proposed Arkadelphia Bypass from Hwy 67 to Hwy 51/8 in Clark County, Arkansas. Some areas in the proposed area are considered Prime Farmland or Farmland of Statewide Importance, as showed on the attached maps.

Should you have any questions or need additional information, please call me at (870) 345-3347 or email at marie.ross@usda.gov

Sincerely,

Marie Ross
Resource Soil Scientist
USDA-Natural Resources Conservation Service
640 South 6th Street
Arkadelphia AR 71923
870-345-3347

U.S. DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service

NRCS-CPA-106
(Rev. 1-91)

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

PART I *(To be completed by Federal Agency)*	3. Date of Land Evaluation Request 1/13/20	4. Sheet 1 of 1
1. Name of Project **Arkadelphia West Bypass ARDOT 070422**	5. Federal Agency Involved **FHWA**	
2. Type of Project **New Bypass Facility**	6. County and State **Clark County, AR**	

PART II *(To be completed by NRCS)*	1. Date Request Received by NRCS 1/16/20	2. Person Completing Form **Marie Ross**
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form). YES ☑ NO ☐		4. Acres Irrigated 79 / Average Farm Size 128
5. Major Crop(s) **soybeans**	6. Farmable Land in Government Jurisdiction Acres: **309,138** % **54.7**	7. Amount of Farmland As Defined in FPPA Acres: 252,989 % 42
8. Name Of Land Evaluation System Used **SCS/LESA**	9. Name of Local Site Assessment System **Arkansas**	10. Date Land Evaluation Returned by NRCS **1/28/20**

PART III *(To be completed by Federal Agency)*	Alternative Corridor For Segment (Preferred Alternative)			
	Corridor A	**Corridor B**	**Corridor C**	**Corridor D**
A. Total Acres To Be Converted Directly	100.5			
B. Total Acres To Be Converted Indirectly, Or To Receive Services	**0**			
C. Total Acres In Corridor	100.5			
PART IV *(To be completed by NRCS) Land Evaluation Information*				
A. Total Acres Prime And Unique Farmland	**21.8**			
B. Total Acres Statewide And Local Important Farmland	**5.6**			
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted	**0.03**			
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value	**100**			
PART V *(To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)*	21.9			

PART VI *(To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))*	**Maximum Points**				
1. Area in Nonurban Use	**15**				
2. Perimeter in Nonurban Use	**10**				
3. Percent Of Corridor Being Farmed	**20**				
4. Protection Provided By State And Local Government	**20**				
5. Size of Present Farm Unit Compared To Average	**10**				
6. Creation Of Nonfarmable Farmland	**25**				
7. Availablility Of Farm Support Services	**5**				
8. On-Farm Investments	**20**				
9. Effects Of Conversion On Farm Support Services	**25**				
10. Compatibility With Existing Agricultural Use	**10**				
TOTAL CORRIDOR ASSESSMENT POINTS	**160**	**0**	**0**	**0**	**0**
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland (From Part V)	**100**	**21.9**	**0**	**0**	**0**
Total Corridor Assessment (From Part VI above or a local site assessment)	**160**	**0**	**0**	**0**	**0**
TOTAL POINTS *(Total of above 2 lines)*	**260**	**21.9**	**0**	**0**	**0**

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used?
			YES ☐ NO ☐

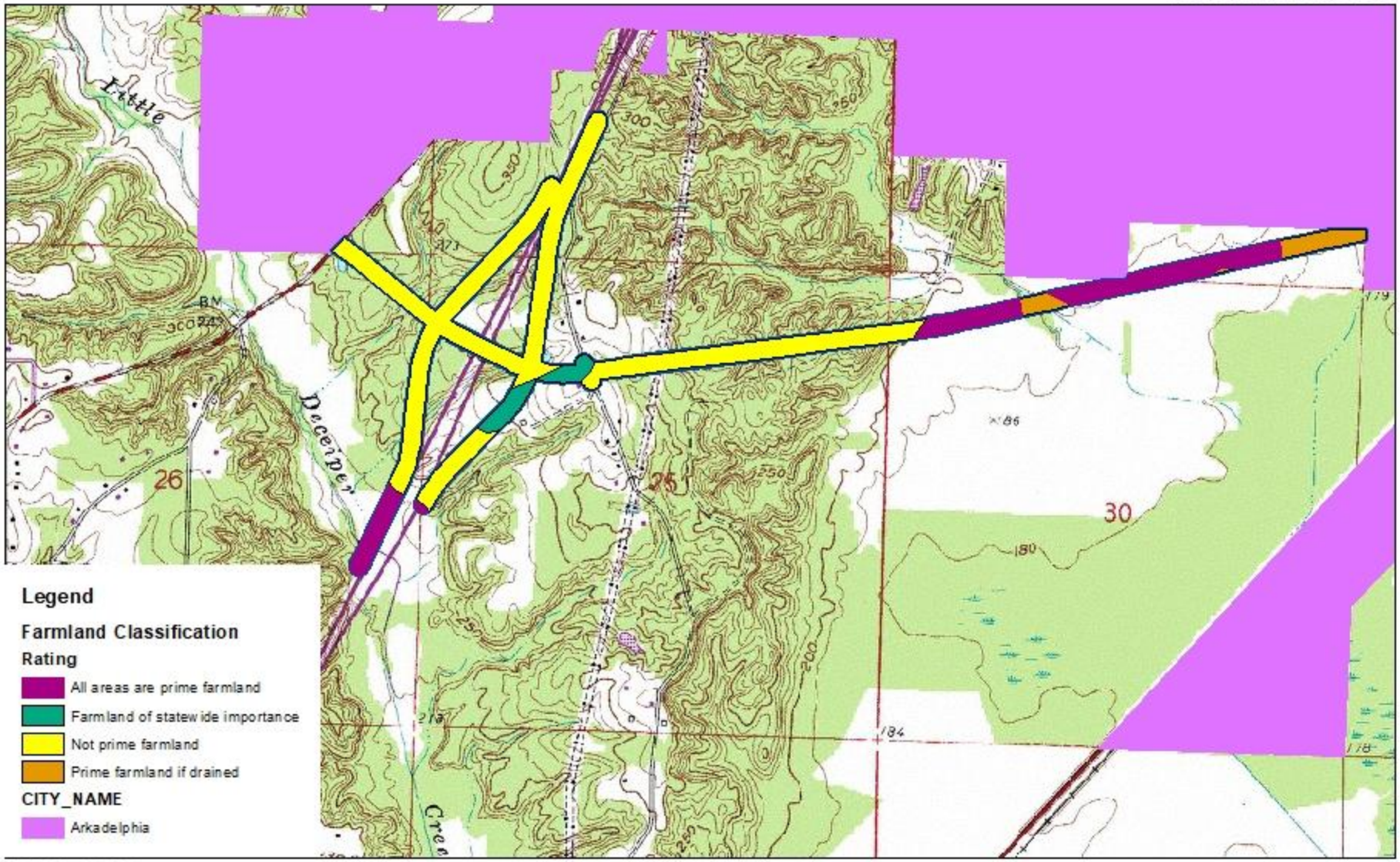
5. Reason For Selection:

Signature of Person Completing this Part: | DATE

NOTE: Complete a form for each segment with more than one Alternate Corridor

Farmland Classification
Arkadelphia Bypass Hwy 67 to Hwy 51/8
West Alignment
Clark County, AR
ArDOT Job No. 070422

Assisted by: Marie Ross, RSS
NRCS Arkadelphia Service Center
Date: January 28, 2020



1:20,000

USGS Topo

IN REPLY REFER TO:

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Arkansas Ecological Service Field Office
110 South Amity Road, Suite 300
Conway, Arkansas 72032

May 23, 2018

Mr. Bill McAbee
Environmental Manager
Garver, LLC
4701 Northshore Drive
North Little Rock, Arkansas 72118

Dear Mr. McAbee:

The Service has reviewed your letter and request for information in preparation of National Environmental Policy Act (NEPA) documents for the Arkansas Department of Transportation (ArDOT) related to the Arkadelphia Bypass from U.S. Highway 67 to Arkansas Highway 51/8 near Arkadelphia, Clark County, Arkansas. The request for information is related to development of alternatives for ArDOT Job No. 070442 and was received on May 17, 2018.

Your letter specifically requested review of the proposed study area and to notify you of any constraints or concerns regarding the proposed project, such as unique environmental features or environmentally sensitive areas, socio-economic issues, proposed urban developments, and permit or approvals that should be obtained prior to construction of the project. The Service has reviewed the project location, along with our records and offers the following comments.

As indicated within your letter, the Information for Planning and Consultation System (IPaC), identified a total of 9 threatened, endangered, or candidate species within the vicinity of this action, along with other species of conservation concern. The list includes:

Federally Listed Species

Northern Long-eared Bat *Myotis septentrionalis*	Threatened
Piping Plover *Charadrius melodus*	Threatened
Arkansas Fatmucket *Lampsilis powellii*	Threatened
Ouachita Rock Pocketbook *Arcidens wheeleri*	Endangered
Pink Mucket (pearlymussel) *Lampsilis abrupta*	Endangered
Rabbitsfoot *Theliderma cylindrica*	Threatened
Spectaclecase (mussel) *Margaritifera monodonta*	Endangered
Winged Mapleleaf *Quadrula fragosa*	Endangered
American Burying Beetle *Nicrophorus americanus*	Endangered

Critical Habitats There are no critical habitats at this location.

Migratory Birds and Eagles

Certain birds are protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. Due to the proximity to the Ouachita River and the habitat within this area, it is likely that Bald Eagle, *Haliaeetus leucocephalus*, inhabits this area.

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations:

1. The Migratory Bird Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Although each species identified will require further assessment and a determination by the action agency, the primary species that could be affected by this action, depending on the alternative, route, and design of the action are the freshwater mussel species identified that exist and have habitats within the Ouachita River. These species and their habitats lie within the project boundaries identified and the potentially affected areas upstream and downstream of the proposed action. Depending on the nature of the action, this project may require consultation in accordance with Section 7 of the Endangered Species Act.

Sediment and/or nutrient transport from the proposed project location may have direct, indirect, and/or cumulative effects to mussels, fish hosts, and/or their habitat(s). The effects of sedimentation and nutrients (e.g., ammonia, etc.) on mussels, fish, and their habitats are well documented in the scientific literature. Adverse effects associated with sedimentation and nutrification from all phases of construction activities may be minimized and/or alleviated through proper implementation and maintenance of erosion control best management practices and maintaining vegetative buffers. Buffer width is dependent upon slope, vegetation type, and soil types. The Service can provide additional technical assistance on appropriate vegetative buffer widths upon request.

The comments herein are for the sole purpose of providing technical assistance to the action agency or for individual pre-project planning assistance. These comments and opinions should not be misconstrued as an "effect determination" or considered as concurrence with any proceeding determination(s) by the action agency in accordance with Section 7 of the ESA. These comments do not authorize the "take" of a threatened or endangered species as defined under the ESA. There are mechanisms available for project proponents to receive authorization from the Service for "incidental take" (e.g., an ESA Section 10 Incidental Take Permit or a Biological Opinion with "incidental take" provisions).

The Service recommends preliminary planning, use of best management practices, and selection of alternatives that would minimize and/or avoid affects to these species. More detailed recommendations and guidance cannot be provided at this time due to the limited project

information available. We look forward to assisting your further as more details of the action become available and alternatives are selected.

For further assistance or if you have any questions, please contact Lindsey Lewis at (501) 513-4489 or lindsey_lewis@fws.gov.

Sincerely,

Melvin L. Tobin
Field Supervisor

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Arkansas Ecological Service Field Office
110 South Amity Road, Suite 300
Conway, Arkansas 72032

IN REPLY REFER TO:

July 25, 2018

Mr. Bill McAbee
Environmental Manager
Garver, LLC
4701 Northshore Drive
North Little Rock, Arkansas 72118

Dear Mr. McAbee:

The Service has reviewed your letter and request for information in preparation of National Environmental Policy Act (NEPA) documents for the Arkansas Department of Transportation (ArDOT) related to the Arkadelphia Bypass from U.S. Highway 67 to Arkansas Highway 51/8 - West Alignment near Arkadelphia, Clark County, Arkansas. The request for information is related to development of alternatives for ArDOT Job No. 070442 and was received on July 9, 2018.

Your letter specifically requested review of the proposed study area and to notify you of any constraints or concerns regarding the proposed project, such as unique environmental features or environmentally sensitive areas, socio-economic issues, proposed urban developments, and permit or approvals that should be obtained prior to construction of the project. The Service has reviewed the project location along with our records and offers the following comments.

As indicated within your letter, the Information for Planning and Consultation System (IPaC), identified a total of 8 threatened, endangered, or candidate species within the vicinity of this action along with other species of conservation concern. The list includes:

Federally Listed Species

Northern Long-eared Bat *Myotis septentrionalis*	Threatened
Piping Plover *Charadrius melodus*	Threatened
Ouachita Rock Pocketbook *Arcidens wheeleri*	Endangered
Pink Mucket (pearlymussel) *Lampsilis abrupta*	Endangered
Rabbitsfoot *Theliderma cylindrica*	Threatened
Spectaclecase (mussel) *Margaritifera monodonta*	Endangered
Winged Mapleleaf *Quadrula fragosa*	Endangered
American Burying Beetle *Nicrophorus americanus*	Endangered

Critical Habitats There are no critical habitats at this location.

Migratory Birds and Eagles

Certain birds are protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. Due to the proximity to the Ouachita River and the habitat within this area, it is likely that the Bald Eagle, *Haliaeetus leucocephalus*, inhabits this area.

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations:

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Although, each species identified will require further assessment and a determination by the action agency, the primary species that could be affected by this action, depending on the alternative, route, and design of the action, are the freshwater mussel species identified that exist and have habitats within the Ouachita River. These species and their habitats lie within the project boundaries identified and the potentially affected areas upstream and downstream of the proposed action. Depending on the nature of the action, this project may require consultation in accordance with Section 7 of the Endangered Species Act.

Sediment and/or nutrient transport from the proposed project location may have direct, indirect, and/or cumulative effects to mussels, fish hosts, and/or their habitat(s). The effects of sedimentation and nutrients (e.g., ammonia, etc.) on mussels, fish, and their habitats are well documented in the scientific literature. Adverse effects associated with sedimentation and nutrification from all phases of construction activities may be minimized and/or alleviated through proper implementation and maintenance of erosion control best management practices and maintaining vegetative buffers. Buffer width is dependent upon slope, vegetation type, and soil types. The Service can provide additional technical assistance on appropriate vegetative buffer widths upon request.

The comments herein are for the sole purpose of providing technical assistance to the action agency or for individual pre-project planning assistance. These comments and opinions should not be misconstrued as an "effect determination" or considered as concurrence with any proceeding determination(s) by the action agency in accordance with Section 7 of the ESA. These comments do not authorize the "take" of a threatened or endangered species, as defined under the ESA. There are mechanisms available for project proponents to receive authorization from the Service for "incidental take" (e.g., an ESA Section 10 Incidental Take Permit or a Biological Opinion with "incidental take" provisions).

The Service recommends preliminary planning, use of best management practices, and selection of alternatives that would minimize and/or avoid affects to these species. More detailed recommendations and guidance cannot be provided at this time due to limited project

information available. We look forward to assisting you further as more details of the action become available and alternatives are selected.

For further assistance or if you have any questions, please contact Lindsey Lewis at (501) 513-4489 or lindsey_lewis@fws.gov.

Sincerely,

Melvin L. Tobin
Field Supervisor

cc: Project File
Read File
Filename: C:\Users\lilewis\Documents\PROJECTS\FY2018\ARDOT\Job No. 070442 - Arkadelphia Bypass\AFO Letter- West Alignment - ArDOT Job 070442 - Arkadelphia Bypass - Comments.docx

Tribal Consultation

Tribal consultation letters and exhibits were sent to the following tribes for the project. Tribal response dates are noted.

Caddo Nation

- Response received May 24, 2018

Chickasaw Nation

- No response received to date

Choctaw Nation of Oklahoma

- No response received to date

Jena Band of the Choctaw Indians

- No response received to date

Osage Nation

- No response received to date

Quapaw Tribe of Oklahoma

- Response received June 1, 2018

Shawnee Tribe of Oklahoma

- No response received to date

Tunica-Biloxi Tribe of Louisiana, Inc.

- No response received to date

QUAPAW TRIBE OF OKLAHOMA

P.O. Box 765
Quapaw, OK 74363-0765

(918) 542-1853
FAX (918) 542-4694

RECEIVED
ARDOT
JUN 04 2018
ENVIRONMENTAL
DIVISION

June 1, 2018

Arkansas State Highway and
Transportation Department
P.O. Box 2261
Little Rock, Arkansas 72203-2261

Re: ArDOT Job No 070442 Hwy 67, 51 (Arkadelphia Bypass) P.E. Clark County, Arkansas

To whom it may concern,

The Quapaw Tribe Historic Preservation Office has received and reviewed the information provided for the proposed ArDOT Job No 070442 Hwy 67, 51 (Arkadelphia Bypass) P.E. Clark County, Arkansas and concurs with your recommendations for this to conduct a cultural resources survey.

In accordance with the National Historic Preservation Act, (NHPA) [16 U.S.C. 470 §§ 470-470w-6] 1966, undertakings subject to the review process are referred to in S101 (d) (6) (A), which clarifies that historic properties may have religious and cultural significance to Indian tribes. Additionally, Section 106 of NHPA requires Federal agencies to consider the effects of their actions on historic properties (36 CFR Part 800) as does the National Environmental Policy Act (43 U.S.C. 4321 and 4331-35 and 40 CFR 1501.7(a) of 1969).

The Quapaw Tribe has vital interests in protecting its historic and ancestral cultural resources. We do not anticipate that this project will adversely impact any cultural resources or human remains protected under the NHPA, NEPA, or the Native American Graves Protection and Repatriation Act. If however, artifacts or human remains are discovered during project construction, we ask that work cease immediately and that you contact the Quapaw Tribe Historic Preservation Office.

Should you have any questions or need any additional information, please feel free to contact me at the number listed below. Thank you for consulting with the Quapaw Tribe on this matter.

Sincerely,

Everett Bandy

Tribal Historic Preservation Office
Quapaw Tribe of Oklahoma
P.O. Box 765
Quapaw, OK 74363
(w) 918-238-3100

Appendix D – Conceptual Stage Relocation Study

CONCEPTUAL STAGE RELOCATION STUDY

Job 070442
Hwy. 67 - Hwy. 51 (Arkadelphia Bypass) P.E.
Clark County

September 9, 2020

GENERAL STATEMENT OF RELOCATION PROCEDURE

Persons displaced as a direct result of acquisition for the proposed project will be eligible for relocation assistance in accordance with Public Law 91-646, the Uniform Relocation Assistance and Real Property Acquisitions Policy Act of 1970, as amended (The Uniform Act). The Relocation Program provides advisory assistance and payments to minimize the adverse impact and hardship of displacement upon such persons. No lawful occupant shall be required to move without receiving a minimum of 90 days advance written notice. All displaced persons; residential, business, farm, nonprofit organization, and personal property relocatees are eligible for reimbursement for actual reasonable moving costs.

It is the Department's Policy that adequate replacement housing will be made available, built if necessary, before any person is required to move from their dwelling. All replacement housing must be fair housing and offered to all affected persons regardless of race, color, religion, sex or national origin. Construction of the project will not begin until decent, safe and sanitary replacement housing is in place and offered to all affected persons.

There are two basic types of residential relocation payments: (1) Replacement Housing payments and (2) Moving Expense payments. Replacement Housing payments are made to qualified owners and tenants. An owner may receive a payment of up to $31,000.00 for the increased cost of a comparable replacement dwelling. The amount of this payment is determined by a study of the housing market. Owners may also be eligible for payments to compensate them for the increased interest cost for a new mortgage and the incidental expenses incurred in connection with the purchase of a replacement dwelling. A tenant may receive a rental subsidy payment of up to $7,200.00. Tenants may elect to receive a down payment rather than a rental subsidy to enable them to purchase a replacement dwelling. Replacement Housing payments are made in addition to Moving Expense payments.

Businesses, farms, and nonprofit organizations are eligible for reestablishment payments, not to exceed $25,000.00. Reestablishment expense payments are made in addition to moving expense payments. A business, farm, or nonprofit organization may be eligible for a fixed payment in lieu of the moving costs and reestablishment costs if relocation cannot be accomplished without a substantial loss of existing patronage. The fixed payment will be computed in accordance with the Uniform Relocation Act and cannot exceed $40,000.00.

If the displacee is not satisfied with the amounts offered as relocation payments, they will be provided a form to assist in filing a formal appeal. A hearing will be arranged at a time and place convenient for the displacee, and the facts of the case will be promptly and carefully reviewed.

Relocation services will be provided until all persons are relocated or their relocation eligibility expires. The Relocation Office will have listings of available replacement housing and commercial

properties. Information is also maintained concerning other Federal and State Programs offering assistance to displaced persons.

PROJECT SPECIFIC DISPLACEMENTS

Based on preliminary right-of-way plans and aerial photographs, it is estimated that the alternatives under consideration for the subject project could cause the following displacements and costs:

WEST BYPASS ALTERNATIVES

Alternative A:

No Relocation

Alternative B:

No Relocation

Alternative H:

2	Residential Owners	$	80,000.00
4	Residential Tenants	$	56,000.00
2	Landlord Businesses	$	50,000.00
5	Businesses	$	212,000.00
1	Nonprofit Organization	$	40,000.00
	Total	**$**	**438,000.00**

EAST BYPASS ALTERNATIVES

Alternative D:

1	Residential Owner	$	40,000.00
2	Residential Tenants	$	24,000.00
4	Landlord Businesses	$	100,000.00
9	Businesses	$	360,000.00
1	Nonprofit Organization	$	40,000.00
	Total	**$**	**564,000.00**

Alternative F:

1	Residential Owner	$	40,000.00
2	Residential Tenants	$	24,000.00
2	Landlord Businesses	$	50,000.00
2	Businesses	$	83,000.00
	Total	**$**	**197,000.00**

Alternative G:

1	Residential Owner	$	40,000.00
2	Businesses	$	83,000.00
	Total	**$**	**123,000.00**

INTERCHANGE ALTERNATIVES

Alternative 1:

18	Residential Tenants	$	252,000.00
1	Landlord Business	$	25,000.00
4	Businesses	$	166,000.00
	Total	**$**	**443,000.00**

Alternative 1A:

1	Business	$	40,000.00
	Total	**$**	**40,000.00**

Alternative 2:

1	Business	$	40,000.00
	Total	**$**	**40,000.00**

Alternative 3:

3	Residential Tenants	$	42,000.00
1	Landlord Business	$	25,000.00
5	Businesses	$	212,000.00
	Total	**$**	**279,000.00**

The general characteristics of the displacees to be relocated are listed on the Conceptual Stage Relocation Inventory forms in the back of this report.

An available housing inventory has been compiled and it indicates there are at least 51 comparable replacement dwellings available for sale, 19 residential lots available for sale, and 10 comparable replacement dwellings available for rent within a reasonable proximity of the project area. At least nine developed commercial properties and three vacant land commercial properties are currently for sale in the project area. There are no known commercial properties for lease at the time of this report. A breakdown of the available properties is as follows:

Residential (For Sale)	Number of Units
$ 0.00 - 50,000	5
50,001 - 100,000	11
100,001 - 150,000	14
150,001 and up	21
Total	**51**

Residential Lots (For Sale)	
$ 0.00 - 25,000	10
25,001 - 50,000	3
50,001 and up	6
Total	**19**

Residential	
(Monthly Rent)	
$ 0.00 - 500.00	4
501.00 and up	6
Total	**10**
Commercial Properties	
(For Sale)	
$ 0 - 100,000	1
100,001 - 200,000	2
200,001 - 300,000	3
300,001 - 400,000	0
401,000 and up	3
Total	**9**
Commercial Land	
(For Sale)	
$ 0 - 100,000	0
100,001 - 200,000	1
200,001 and up	2
Total	**3**
Commercial Properties	
(For Lease)	
$ 0 - 1,000	0
1,001 - 2,000	0
2,001 and up	0
Total	**0**

This is a new location bypass project in Arkadelphia, AR. The dwellings and number of dwellings are comparable and adequate to provide replacement housing for the families displaced on the project. The housing market should not be detrimentally affected and there should be no problems with insufficient housing at this time. In the event housing cannot be found or can be found but not within the displacees' economic means at the time of displacement, Section 206 of Public Law 91-646 (Housing of Last Resort) will be utilized to its fullest and practical extent.

The replacement property inventory was compiled from data obtained from real estate companies and web sites for the subject area. The dwellings contained in the inventory have been determined to be comparable and decent, safe, and sanitary. The locations of the comparable dwellings are not less desirable in regard to public utilities and public and commercial facilities, are reasonably accessible to the displacees' places of employment, adequate to accommodate the displacees, and in neighborhoods which are not subject to unreasonable adverse environmental factors. It has also been determined that the available housing is within the financial means of the displacees and is fair housing open to all persons regardless of race, color, sex, religion or national origin consistent with the requirements of 49 CFR, Subpart A, Section 24.2 and Title VIII of the Civil Rights Act of 1968.

A commercial property inventory indicates there are at least nine developed properties and three vacant lots available in the subject area at this time. The businesses displaced on the project may not be able to relocate in the immediate area of their displacement resulting in termination of the operation. However, in order to assist the displaced businesses and nonprofit organizations in

relocating, the State will explore all possible sources of funding or other resources that may be available to businesses and nonprofit organizations. Sources that will be considered include: State and Local entities, the Department of Housing and Urban Development, the Economic Development Administration, the Small Business Administration, and other Federal Agencies. Emphasis will be given in providing relocation advisory services to the businesses and nonprofit organizations. Appropriate measures will be taken to ensure that each entity displaced is fully aware of their benefits, entitlements, courses of action that are open to it, and any special provisions designed to encourage businesses and nonprofit organizations to relocate within the same community.

All displacees will be offered relocation assistance under provisions in the applicable FHWA regulations. At the time of displacement another inventory of available housing in the subject area will be obtained and an analysis of the market made to ensure that there are dwellings adequate to meet the needs of all displacees. Also, special relocation advisory services and assistance will be administered commensurate with displacees' needs, when necessary. Examples of these include, but are not limited to, Housing of Last Resort as previously mentioned and consultation with local officials, social and federal agencies, and community groups.

There are no other identified unusual conditions involved with this project.

CONCEPTUAL STAGE RELOCATION INVENTORY

Job No.: 070442 Job Name: Hwy. 67 - Hwy. 51 (Arkadelphia Bypass) P.E. Date of Inventory: September 9, 2020

Relo. #	Relo. Type[1]	Description	Address	Eligible Costs[2]	Property Value Estimate[3]	# Employees	Occ. Length (Yrs)
West Bypass Alternative H							
1	LLBus + ResTen	Mobile Home	369 Red Hill Rd	$39,000	$15,000		
2	ResOwn	Home	379 Red Hill Rd	$40,000	$34,000		
3	ResOwn	Home	429 Red Hill Rd	$40,000	$188,550		
4-6	LLBus + ResTen	Portion of Cox Mobile Manor with 3 residential tenant relocations	3027 Pine St	$67,000	$28,500*	1	60
7	NPOrg	Grace Fellowship Church	469 Red Hill Rd	$40,000	$2,800,000	1	40
8	Bus	Arkadelphia Physical Therapy	3030 Pine St	$40,000	$785,000	8	19
9	Bus	Lucky Liquor	3035 Pine St	$46,000	$275,000	5	8
10	Bus	Private Mechanic Garage	24 Red Hill Rd	$46,000	$240,000	3 - 4	5
11	Bus	AT&T Store	3032 Pine St	$40,000	$315,000	Unk	Unk
12	Bus	Dimensions Sound & Vision	280 Professional Park Dr	$40,000	$320,000	2	18
East Bypass Alternative D							
1	LLBus + ResTen	Home	924 Main St	$37,000	$45,000		
2	LLBus	Home (Vacant)	925 Clay St	$25,000	$42,900		
3	LLBus + ResTen	Home	922 Crittenden St	$37,000	$35,000		
4	ResOwn	Home	529 S 9th St	$40,000	$182,450		
5	Bus	KFC	921 Clinton St	$40,000	$250,000	18	1
6	LLBus + NPOrg	Grace Bible Church	922 Main St	$65,000	$65,000	Unk	Unk
7	Bus	Mary & Martha's Florist & Gifts	921 Main St	$40,000	$220,000	3-4	13

Relo. #	Relo. Type[1]	Description	Address	Eligible Costs[2]	Property Value Estimate[3]	# Employees	Occ. Length (Yrs)
8	Bus	Ark. Dept. Community Corrections	911 Main St	$40,000	$135,000	Unk	Unk
9	Bus	Kidsource Therapy (Vacant)	Unknown	$40,000	$70,650	0	Unk
10	Bus	U-Lok-It Storage (Vacant & Listed for Sale for $289k)	921 Clay St	$40,000	$70,500	0	
11	Bus	Lane Refrigeration	903 Carpenter St	$40,000	$159,400	Unk	Unk
12	Bus	Security Warehouse (3 western-most buildings relocated)	725 S 7th St	$40,000	$288,200	2	20
13	Bus	NAPA Autoparts	922 Clinton St	$40,000	$239,050	3-4	15
14	Bus	Stewarts Auto Sales, Inc.	102 N 10th St.	$40,000	$66,700	1	24
East Bypass Alternative F							
1	LLBus + ResTen	Home	117 Hemphill Rd	$37,000	$6,800		
2	LLBus + ResTen	Home (eastern-most only)	108 Clay St	$37,000	$130,000		
3	ResOwn	Home	111 S 1st St	$40,000	$46,000		
4	Bus	Wade's Cabinet Shop	921 Highway 67 S	$43,000	$350,000	2	43
5	Bus	Unnamed commercial complex (Vacant)	Unk	$40,000	$43,100	0	Unk
East Bypass Alternative G							
1	ResOwn	Home	727 C St	$40,000	$37,000		
2	Bus	Wade's Cabinet Shop	921 Highway 67 S	$43,000	$350,000	2	43
3	Bus	Unnamed commercial complex (Vacant)	Unknown	$40,000	$43,100	0	Unk
Interchange Alternative 1							
1	Bus	Lucky Liquor	3035 Pine St	$46,000	$275,000	5	8
2	Bus	Exxon / Blackmon Oil Co.	3036 Pine St	$40,000	$406,000	11	8
3	Bus	Andy's Restaurant	2927 Pine St	$40,000	$365,000	Unk	Unk

Relo. #	Relo. Type[1]	Description	Address	Eligible Costs[2]	Property Value Estimate[3]	# Employees	Occ. Length (Yrs)
4	Bus	Citgo	3039 Pine St	$40,000	$350,000	3	1
5-22	LLBus + ResTen	Portion of Cox Mobile Manor with 18 residential tenant relocations	3027 Pine St	$277,000	$1,500,000	1	60
Interchange Alternative 1A							
1	Bus	Exxon / Blackmon Oil Co.	3036 Pine St	$40,000	$406,000	11	8
Interchange Alternative 2							
1	Bus	Exxon / Blackmon Oil Co.	3036 Pine St	$40,000	$406,000	11	8
Interchange Alternative 3							
1-3	LLBus + ResTen	Portion of Cox Mobile Manor with 3 residential tenant relocations	3027 Pine St	$67,000	$28,500	1	60
4	Bus	Arkadelphia Physical Therapy	3030 Pine St	$40,000	$785,000	8	19
5	Bus	Lucky Liquor	3035 Pine St	$46,000	$275,000	5	8
6	Bus	Private Mechanic Garage	24 Red Hill Rd	$46,000	$240,000	3 - 4	5
7	Bus	Dimensions Sound & Vision	280 Professional Park Dr	$40,000	$320,000	2	18
8	Bus	AT&T Store	3032 Pine St	$40,000	$315,000	Unk	Unk

[1] Relo. Type:

ResOwn	Residential Owner
ResTen	Residential Tenant
LLBus	Landlord Business
Bus	Business
NPOrg	Nonprofit Organization

[2] Replacement Housing Payment, Rental Assistance Payment, Reestablishment Payment, Search Expense Payment, &/or Moving Costs. NOTE: For those displacements involving a mobile home, car lift (mechanic garage), or shipping container (Lucky Liquor), an additional estimated cost of $3,000 per house/lift/container was applied to the moving cost.

[3] Based on ROW cost estimates, county parcel data, and/or estimated cost per acre for last reported sales price.

CONCEPTUAL STAGE RELOCATION INVENTORY

Job No.: 070442 Job Name: Hwy. 67 - Hwy. 51 (Arkadelphia Bypass) P.E. Date of Inventory: September 8, 2020

West Bypass Alternative A

Relocation Type	Number	Property Values or Residential Rental Rates[1]	Employees Affected (Range)
Residential Owners	0		
Residential Tenants	0		
Landlord Businesses	0		
Businesses	0		
Nonprofit Organizations	0		
Totals	0	N/A	0

[1] Based on interviews, ROW cost estimates, county parcel data, sales price, and/or estimated cost per acre for last reported sales price.

West Bypass Alternative B

Relocation Type	Number	Property Values or Residential Rental Rates[1]	Employees Affected (Range)
Residential Owners	0		
Residential Tenants	0		
Landlord Businesses	0		
Businesses	0		
Nonprofit Organizations	0		
Totals	0	N/A	0

[1] Based on interviews, ROW cost estimates, county parcel data, sales price, and/or estimated cost per acre for last reported sales price.

West Bypass Alternative H

Relocation Type	Number	Property Values or Residential Rental Rates[1]	Employees Affected (Range)
Residential Owners	2	$30,000.00 - $261,000.00	N/A
Residential Tenants	4	$125.00 - $725.00	N/A
Landlord Businesses	2	$7,200.00 - $1,5000,000.00	1 - 2
Businesses	5	$93,000.00 - $785,000.00	1 - 8
Nonprofit Organizations	1	$2,800,000.00	1
Totals	12	N/A	3 - 11

[1] Based on interviews, ROW cost estimates, county parcel data, sales price, and/or estimated cost per acre for last reported sales price.

East Bypass Alternative D

Relocation Type	Number	Property Values or Residential Rental Rates[1]	Employees Affected (Range)
Residential Owners	1	$181,000.00 - $243,000.00	N/A
Residential Tenants	2	$850.00 - $950.00	N/A
Landlord Businesses	4	$35,000.00 - $90,000.00	Unknown
Businesses	9	$65,000.00 - $480,000.00	0 - 4
Nonprofit Organizations	1	$53,000.00 - $65,000.00	Unknown
Totals	14	N/A	0 - 4

[1] Based on interviews, ROW cost estimates, county parcel data, sales price, and/or estimated cost per acre for last reported sales price.

East Bypass Alternative F

Relocation Type	Number	Property Values or Residential Rental Rates[1]	Employees Affected (Range)
Residential Owners	1	$46,000.00 - $97,000.00	N/A
Residential Tenants	2	$750.00 - $1,000.00	N/A
Landlord Businesses	2	$5,000.00 - $130,000.00	Unknown
Businesses	2	$27,000.00 - $350,000.00	0 - 2
Nonprofit Organizations	0		
Totals	5	N/A	0 - 2

[1] Based on interviews, ROW cost estimates, county parcel data, sales price, and/or estimated cost per acre for last reported sales price.

East Bypass Alternative G

Relocation Type	Number	Property Values or Residential Rental Rates[1]	Employees Affected (Range)
Residential Owners	1	$5,000.00 - $49,000.00	N/A
Residential Tenants	0		N/A
Landlord Businesses	0		
Businesses	2	$27,000.00 - $350,000.00	0 - 2
Nonprofit Organizations	0		
Totals	3	N/A	0 - 2

[1] Based on interviews, ROW cost estimates, county parcel data, sales price, and/or estimated cost per acre for last reported sales price.

Interchange Alternative 1

Relocation Type	Number	Property Values or Residential Rental Rates[1]	Employees Affected (Range)
Residential Owners	0		N/A
Residential Tenants	18	$125.00 - $135.00	N/A
Landlord Businesses	1	1,500,000.00	1
Businesses	4	$272,000.00 - $406,000.00	3 - 11
Nonprofit Organizations	0		
Totals	22	N/A	1 - 11

[1] Based on interviews, ROW cost estimates, county parcel data, sales price, and/or estimated cost per acre for last reported sales price.

Interchange Alternative 1A

Relocation Type	Number	Property Values or Residential Rental Rates[1]	Employees Affected (Range)
Residential Owners	0		N/A
Residential Tenants	0		N/A
Landlord Businesses	0		
Businesses	1	$406,000.00	11
Nonprofit Organizations	0		
Totals	1	N/A	11

[1] Based on interviews, ROW cost estimates, county parcel data, sales price, and/or estimated cost per acre for last reported sales price.

Interchange Alternative 2

Relocation Type	Number	Property Values or Residential Rental Rates[1]	Employees Affected (Range)
Residential Owners	0		N/A
Residential Tenants	0		N/A
Landlord Businesses	0		
Businesses	1	$406,000.00	11
Nonprofit Organizations	0		
Totals	1	N/A	11

[1] Based on interviews, ROW cost estimates, county parcel data, sales price, and/or estimated cost per acre for last reported sales price.

Interchange Alternative 3

Relocation Type	Number	Property Values or Residential Rental Rates[1]	Employees Affected (Range)
Residential Owners	0		N/A
Residential Tenants	3	$125.00 - $135.00	N/A
Landlord Businesses	1	$29,000.00 - $1,500,000.00	1
Businesses	5	$93,000.00 - $785,000.00	1 - 8
Nonprofit Organizations	0		
Totals	8	N/A	1 - 8

[1] Based on interviews, ROW cost estimates, county parcel data, sales price, and/or estimated cost per acre for last reported sales price.

Appendix E – Noise Screening

Job Number 070442

Screening Level Noise Assessment

Fundamentals of Sound and Noise

Noise is defined as unwanted or undesirable sound. The three basic parameters of how noise affects people are summarized below.

Intensity is determined by the level of sound expressed in units of decibels (dB). A 3 dB change in sound level is barely perceptible to most people in typical outdoor settings. However, a 5 dB increase presents a noticeable change and a 10 dB sound level increase is perceived to be twice as loud. Outdoor conversation at normal levels at a distance of 3 feet becomes difficult when the sound level exceeds the mid-60 dBA range.

Frequency is related to the tone or pitch of the sound. The amplification or attenuation of different frequencies of sound to correspond to the way the human ear hears these frequencies is referred to as “A-weighting.” The A-weighted sound level in decibels is expressed as dBA.

Variation with time occurs because most noise fluctuates from moment to moment. A single level called the equivalent sound level (Leq) is used to compensate for this fluctuation. The Leq is a steady sound level containing the same amount of sound energy as the actual time-varying sound evaluated over the same time period. The Leq averages the louder and quieter moments, but gives more weight to the louder moments.

For highway noise assessment purposes, Leq is typically evaluated over the worst 1-hour period and written as Leq(h). The Leq(h) commonly describes sound levels at locations of outdoor human use and activity, and reflects the conditions that will typically produce the worst traffic noise (e.g., the highest traffic volumes traveling at the highest possible speeds).

Noise Impact and Abatement Criteria

Traffic noise impacts are determined by comparing design year Leq(h) values to: (1) a set of Noise Abatement Criteria (NAC) for different land use categories; and (2) existing Leq(h) values. A noise impact occurs when design year (future build) levels approach or exceed the NAC value or a substantial increase in noise occurs. An approach is considered to be 1 dBA less than the NAC value. A substantial increase is defined as 10 dBA or greater than existing noise levels.

A *noise sensitive receptor* (receptor) is defined as a representative location of a noise sensitive area for various land uses. Most receptors associated with

highway traffic noise analysis are categorized as NAC Activity Category B (residential) and C (e.g., parks, hospitals, schools, places of worship). Since the NAC value for Activity Categories B and C is 67 dBA, noise impacts would occur at 66 dBA or greater.

Consideration of noise abatement measures is required when the NAC value is approached or exceeded, or when a substantial increase is predicted. Noise barriers (e.g., walls or berms) are the most common noise abatement measures.

Screening Level Noise Analysis

A screening level noise analysis (screening analysis) may be performed for projects that are unlikely to cause noise impacts and/or where noise abatement measures are likely to be unfeasible for acoustical or engineering reasons. Factors common to these types of projects include low traffic volumes, slower speeds, the presence of few or no receptors, and the need for roadway access points (e.g., driveways, roadway intersections, etc.). For screening analysis purposes, the ARDOT noise policy requires determining noise levels within 4 dBA of the NAC value. The screening analysis threshold would therefore be 63 dBA for Activity Categories B and C.

Screening analysis results represent a worst-case scenario with higher sound levels than would be expected in detailed modeling. The results may be used to determine the need for detailed analysis if noise impacts are likely and the placement of noise barriers is feasible. It may also be used for projects that lack receptors in order to assess impacts on undeveloped land for future land use planning purposes.

The FHWA Traffic Noise Model Version 2.5 (TNM) software program is used to predict existing and future Leq(h) traffic noise levels. The TNM straight line model uses the existing year and design year traffic and roadway information. Receptors (discrete points modeled in the TNM program to represent receptors) are incrementally placed away from the roadway centerline to determine the distance to which impacts extend. The model assumes that the roadway and receptors were located at the same elevation with no intervening barriers such as topography or dense vegetation.

Project Evaluation and Screening Analysis Results

Activity Category B and C receptors were identified in the project corridors. The screening analysis considered potential noise impacts for each build alternative, which includes six bypass alternatives and four interchange alternatives. **Table 1** shows results for the urban roadway sections and **Table 2** shows the results of the rural roadway sections. A detailed noise study is likely warranted based on

the results of the screening level analysis in that there are alternatives with no direct driveway access and full control nature of the project alternatives.

TNM modeling was completed using the existing year 2018 and design year 2040 (future build) traffic and roadway information. Receptors were extended from the centerlines of the various alternative alignments to distances correlating to approximately 66 dBA for existing and future build conditions, and 63 dBA for future build conditions. These distances are referred to as noise buffer zones (NBZ). The tenth value was used for rounding the decibel levels (e.g., 63.3 dBA reported as 63 dBA). The locations of outdoor human use and activity representing the receptors was estimated at approximately 5 feet from the structure's entrances. Receptor locations may be representative of many receptors. The model calculation tables, input data, and figures showing the predicted noise impact contours (distance buffers) and receptors are attached.

The alternatives analyzed in this screening are identified below:

1. Alternative A – From existing Highway 67 to the proposed interchange at Pine Street on new alignment.
2. Alternative B – From existing Highway 67 to Red Hill Road on new alignment, then north to Pine Street on partial new alignment.
3. Alternative D – From existing Highway 67 just south of Walnut Street to Clinton Street on new alignment.
4. Alternative F – From existing Highway 67 to 1st Street on partial new alignment.
5. Alternative G – From existing Highway 51 east of the Ouachita River to existing Highway 67 on new alignment.
6. Alternative H – From existing Highway 67 to I-30 on new alignment with a new interchange and collector lanes in both directions on I-30.
7. Interchange Alternatives 1, 1A, 2, and 3

Job Number 070442

Table 1. Noise Levels for Compatibility Planning – Urban

Location	2018		2040		Ambient Measurements (dBA) & Location	NAC Impacted Receptors Existing 66dB NBZ	NAC Impacted Receptors Proposed 66dB NBZ	NAC Receptors Within Future 63dB NBZ	Impacted Receptors by Substantial Increase
	Distance (feet)*	Leq(h), dBA**	Distance (feet)*	Leq(h), dBA**					
	No-Build – Pine Street								
I-30 to 26th St.	40	71	40	71	--	3	1	7	--
	50	69	50	70					
	100	66	110	66					
	165	63	190	63					
26th St. to 1st St.	35	68	35	69	--	50	22	68	--
	50	66	65	66					
	100	63	110	63					
	155	59	155	60					
E. of 1st St.	35	72	35	73	--	0	0	4	--
	50	71	50	71					
	120	66	125	66					
	155	63	160	63					
	Alternative D								
New Alignment	--	--	20	67	45.0 (#3)	0	0	0	8
	--	--	25	66					
	--	--	50	63					
	--	--	100	59					
	Alternative F								
1st St.	20	64	15	65	48.4 (#2)	0	0	0	0
	25	63	25	63					
	50	59	50	59					
	100	56	100	56					

Job Number 070442

Table 2. Noise Levels for Compatibility Planning - Rural

Location	2018		2040		Ambient Measurements (dBA)	NAC Impacted Receptors Existing 66dB NBZ	NAC Impacted Receptors Proposed 66dB NBZ	NAC Receptors Within Future 63dB NBZ	Impacted Receptors by Substantial Increase
	Distance (ft)*	Leq(h), dBA**	Distance (ft)*	Leq(h), dBA**					
	Alternatives A, B, and H								
Hwy. 67 to I-30	--	--	20	67	50.0 (#4)	0	0	0	0
	--	--	25	66	42.9 (#5)				
	--	--	50	63	40.7 (#6)				
	--	--	100	59	51.0 (#7)				
	--	--	150	56					
	--	--	200	53					
	Alternative F								
New Alignment	--	--	27	66	46.1 (#1) 48.4 (#2)	0	0	0	0
	--	--	50	63					
	--	--	100	60					
	--	--	150	56					
	Alternative G								
New Alignment	--	--	30	66	46.1 (#1) 48.4 (#2)	0	0	0	0
	--	--	55	63					
	--	--	100	60					
	--	--	150	57					
	Alternative H								
I-30 (South of Hwy. 51)	100	77	100	78	--	0	0	1	0
	200	72	200	74					
	350	66	350	69					
	450	63	450	66					
	500	62	550	63					
I-30 (North of Hwy. 51)	100	77	100	78	--	9	7	5	0
	200	72	200	74					
	350	66	350	69					
	450	63	450	66					
	500	62	550	63					

* Perpendicular to centerline of Alternative

** Rounded to tenth value

Alternative A - Rural

No receptors were predicted to experience noise impacts within a distance of 50 feet under future build conditions. The proposed right-of-way encompasses the future build 63 dBA screening analysis threshold that falls at this distance from the proposed centerline.

There are six residential areas in close proximity to the new alignment of Alternative A and as a result, ambient noise measurements were collected at representative locations to determine existing noise levels. **Table 2** documents these results in comparison to the TNM predicted noise levels. These comparisons are utilized in determining if there would be a substantial increase. No substantial increases (≥ 10 dBA) were predicted. Noise levels in the project area are already dominated by traffic noise from the existing roadways in the area; however, moderate increases in noise levels could occur (e.g., increases in noise levels ranging from 1 to 7.4 dBA).

Alternative B - Rural

Alternative B utilizes the same route as Alternative A for approximately 1.7 miles before splitting to the west, which is also on new alignment. The same six residential areas and representative ambient measurements are identified in **Table 2**. No substantial increases (≥ 10 dBA) were predicted; however, a moderate increase in noise levels could occur (e.g., increases in noise levels ranging from 1 to 7.4 dBA). The proposed right-of-way encompasses the future build 63 dBA screening analysis threshold that falls at a distance of 50 feet from the centerline.

Alternative D - Urban

Alternative D is a new alignment alternative that is located between Clinton Street and Highway 67. Alternative D is in close proximity to eight residences. An ambient noise measurement of 45 dBA was also collected in this area and compared to the TNM predicted noise levels of the new location roadway. Substantial increases (≥ 10 dBA) were predicted for eight residences with noise levels ranging from 10.6 to 12.6 dBA above ambient measurements. As a result of potential substantial increases for eight receptors, a detailed noise study would be warranted.

Alternative F

- **Urban (Existing Alignment)**

  A portion of Alternative F utilizes the same route of 1st Street before beginning on new location. The existing 66 dBA contour line for 1st Street would fall at the back of curb/edge of pavement. No residences were predicted to experience noise impacts within a distance of 25 feet under the future build conditions. Additionally, no residences fall within the 63

dBA screening analysis threshold at a distance of 25 feet under the future build conditions.

- **Rural (New Alignment)**

  The new alignment portion of Alternative F is in close proximity to five residences. An ambient noise measurement was also collected in this area and compared to the TNM predicted noise levels of the new location roadway. No substantial increases (≥ 10 dBA) were predicted; however, a moderate to high increase in noise levels could occur (e.g., increases in noise levels ranging from 5.5 to 9.8 dBA). No other residences were predicted to experience noise impacts within a distance of 27 feet under the future build conditions. Additionally, no residences fall within the 63 dBA screening analysis threshold at a distance of 50 feet under the future build conditions.

Alternative G - Rural

Alternative G is in close proximity to three residences. An ambient noise measurement was collected in this area at the end of C Street and compared to the TNM predicted noise levels of the new location roadway. A substantial increase (≥ 10 dBA) is not predicted; however, a moderate to high increase in noise levels could occur (e.g., increases in noise levels up to 8.9 dBA). The proposed right-of-way encompasses the future build 66 dBA that falls at a distance of 30 feet from the centerline. Additionally, no residences fall within the 63 dBA screening analysis threshold at a distance of 55 feet under the future build conditions.

Alternative H

Alternative H utilizes the same route as Alternatives A and B for approximately 1.7 miles, then ties to I-30 with a new proposed interchange.

- **Existing Alignment Portion**

  A portion of Alternative H includes adding collector and merge lanes to I-30 and a new interchange. Five (5) residences were predicted to be affected by noise within a distance of 550 feet under future build conditions. Seven (7) residences were predicted to experience noise impacts (66 dBA) within a distance of 450 feet, and nine (9) residences are impacted under existing conditions.

- **Rural (New Alignment)**

  No residences were predicted to experience noise impacts within a distance of 50 feet under future build conditions as I-30 dominates the noise levels along the interstate out to a distance of approximately 550 feet. There are six residential areas in close proximity to the new location portion of Alternative H. Ambient noise measurements were collected at representative locations to determine the ambient noise environment and

utilized in determining if there would be a substantial increase. No substantial increases (≥ 10 dBA) were predicted. Noise levels in the project area are already dominated by traffic noise from the existing roadways; however, a moderate increase in noise levels could occur by the proposed project (e.g., increases in noise levels ranging from 1 to 7.4 dBA). The proposed right-of-way encompasses the future build 63 dBA screening analysis threshold that falls at a distance of 50 feet from the centerline.

Interchange Alternatives at SH-51

Four interchange alternative configurations (Alts. 1, 1A, 2, and 3) as shown on the attached figures were analyzed in this screening analysis. The proposed right-of-way encompasses the future build 63 dBA that falls at a distance of 20 feet from the centerline; therefore no residences fall within the 63 dBA screening analysis threshold under the future build conditions and no substantial increases (≥ 10 dBA) are predicted.

No-Build Alternative

The No-Build condition is considered to be on existing Pine Street and Caddo Street through the City and is in close proximity to approximately 155 receptors. Fifty (50) of these receptors are impacted by the existing conditions. Under future conditions (more forecasted traffic and widening of Pine Street and Caddo Street), twenty-two (22) receptors would be impacted as falling within the NAC 66 dBA threshold and sixty-eight (68) receptors (including several apartment units, two hotels, one school, and one park) would be affected as they fall within the 63 dBA screening analysis threshold. No substantial increases (≥ 10 dBA) are predicted.

As previously noted, access points such as driveways and intersections are needed along the project corridor. For engineering reasons, it would not be possible to construct an effective noise barrier accommodating these access points. A detailed noise analysis is therefore not recommended for this project.

Project construction operations typically increase noise levels. These increases would be temporary and have minimal to minor adverse effects on land uses and activities in the project area. Local ordinances may prohibit construction activities or restrict noise levels or high noise levels between certain time periods (e.g., nighttime and/or weekend work). Temporary construction noise reduction measures such as nighttime and/or weekend work restrictions may also be considered.

Planning Information for Local Officials

The ARDOT encourages local communities and developers to practice noise compatibility planning. As presented in **Table 1** and **Table 2**, noise level

predictions for future build conditions were made at incremental distances. As previously described, rural and urban Activity Category B exterior areas would be impacted within a distance of approximately 150 feet as a result of substantial increase for urban sections and 100-120 feet for rural sections, as measured from the centerline of the alternatives. These predictions do not represent noise levels at every location at a particular distance back from the roadway. Noise levels will vary with changes in terrain and other site conditions.

Table 3 presents the NAC. This information is included to inform local officials and planners of anticipated noise levels so that future development will be compatible. In compliance with federal guidelines, a copy of this screening analysis will be transmitted to the City of Arkadelphia and regional planning commission for land use planning purposes.

Table 3. Noise Abatement Criteria (NAC)

Activity Category	$L_{eq(h)}$ dBA	Evaluation Location	Activity Description
A	57	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B*	67	Exterior	Residential properties.
C*	67	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structure, radio stations, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structure, radio studios, recording studios, schools, and television studios.
E*	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D, or F.

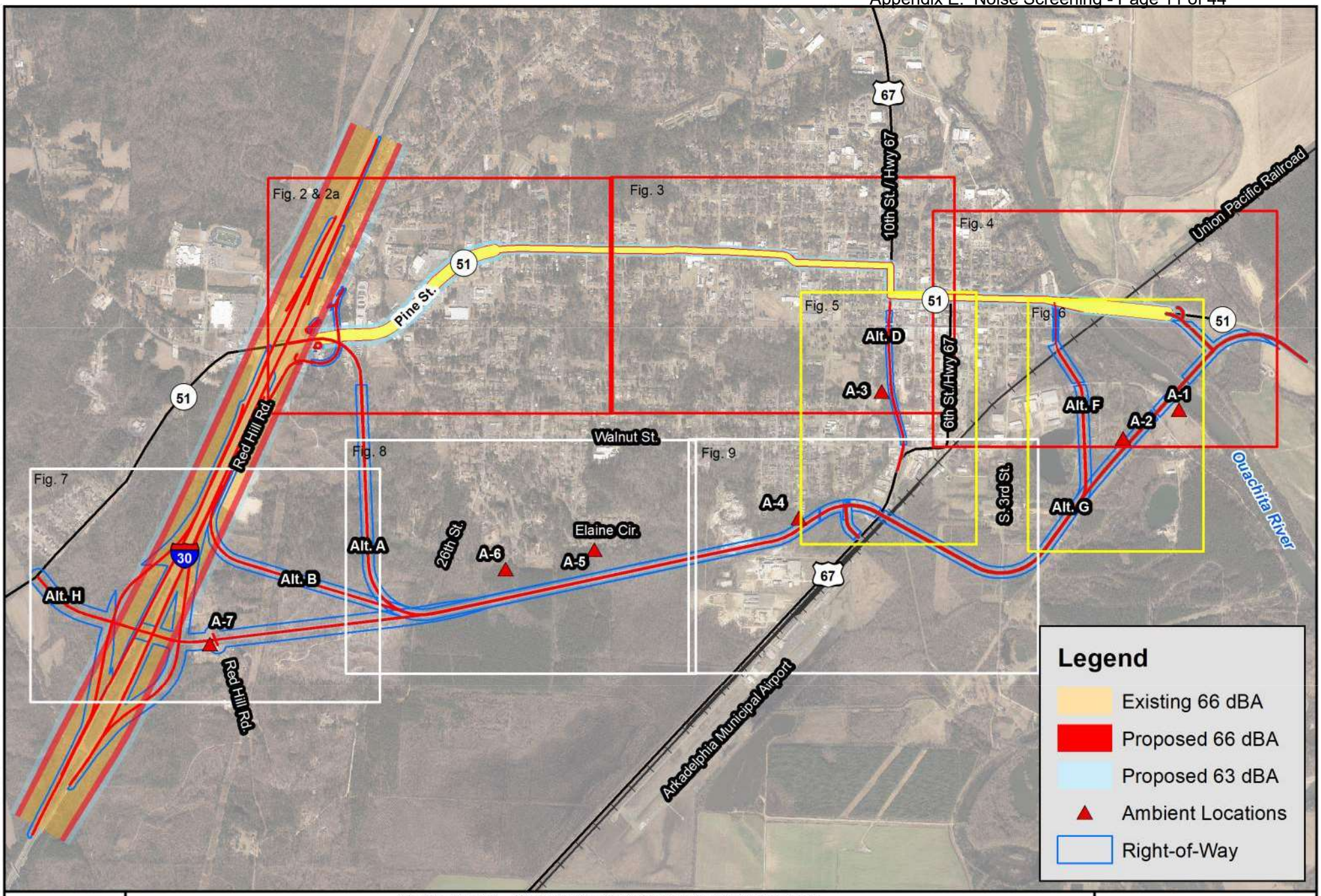
Job Number 070442

Activity Category	$L_{eq(h)}$ dBA	Evaluation Location	Activity Description
F	–––	–––	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	–––	–––	Undeveloped lands that are not permitted.

* Includes undeveloped lands permitted for this activity category.

Attachments

Figures 1-9
Traffic Worksheets and TNM Results



GARVER

N

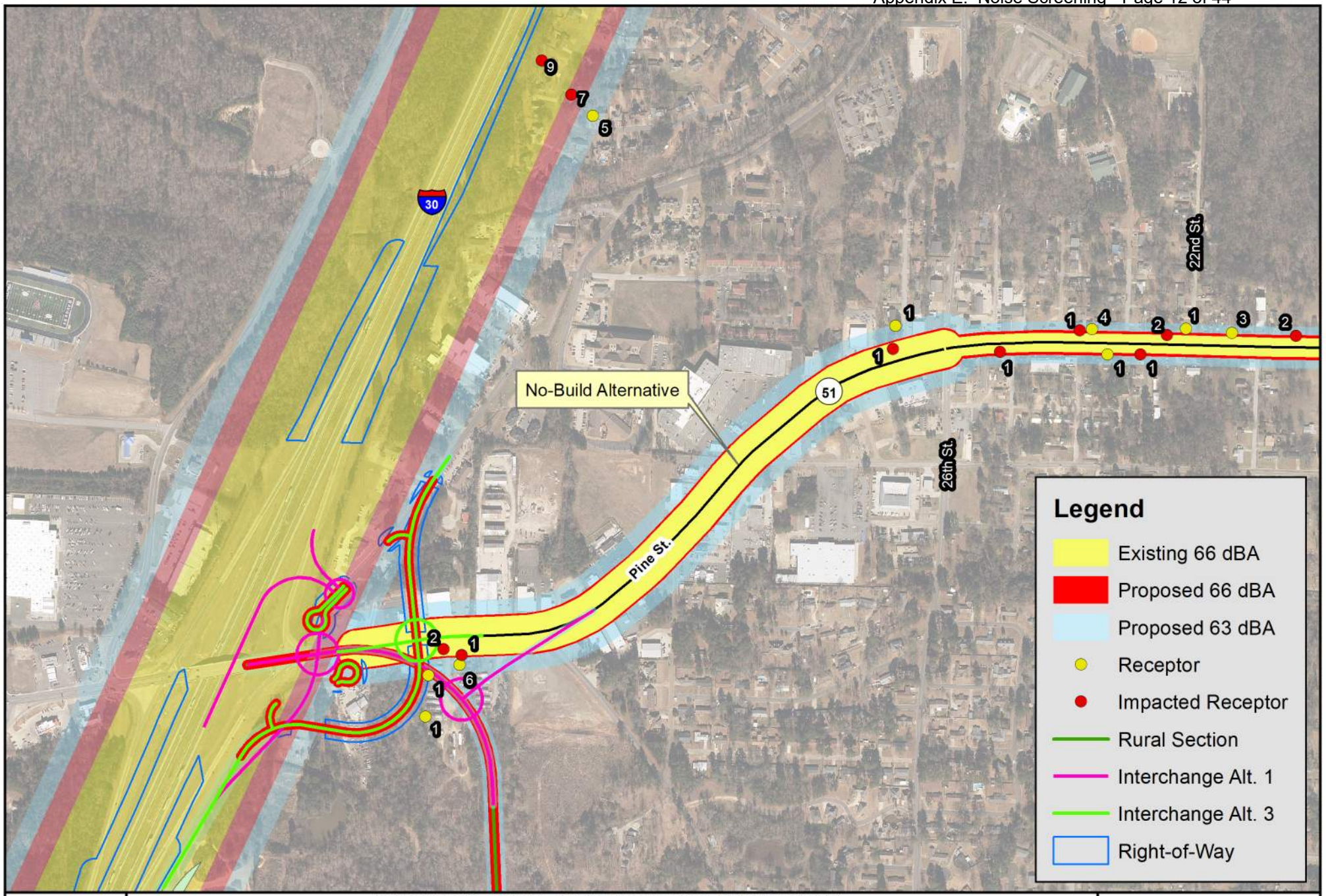
NOISE MEMO - 63 & 66 dB CONTOUR LINES OVERVIEW

ARDOT Job No. 070442, Hwy. 67 to Hwy. 51 (Arkadelphia Bypass) P.E.
Arkadelphia, Clark County, Arkansas

2017 Aerial Image; ARKANSAS GIS OFFICE

0 0.1 0.2 0.3 0.4 0.5
Miles

Figure 1



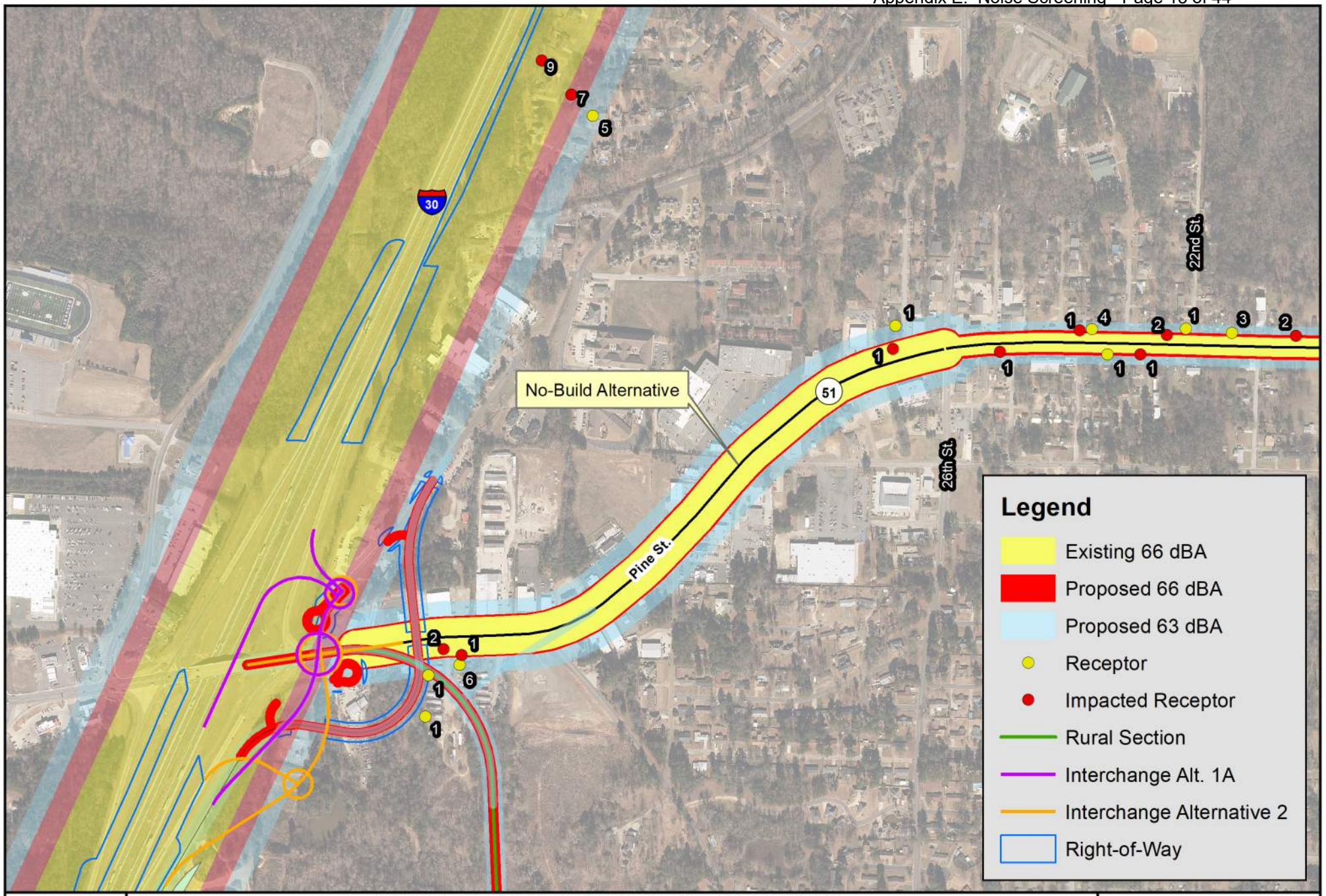
GARVER

NOISE MEMO - 63 & 66 dB CONTOUR LINES - DETAILED VIEW

ARDOT Job No. 070442, Hwy. 67 to Hwy. 51 (Arkadelphia Bypass) P.E.
Arkadelphia, Clark County, Arkansas

2017 Aerial Image; ARKANSAS GIS OFFICE

Figure 2



GARVER

N

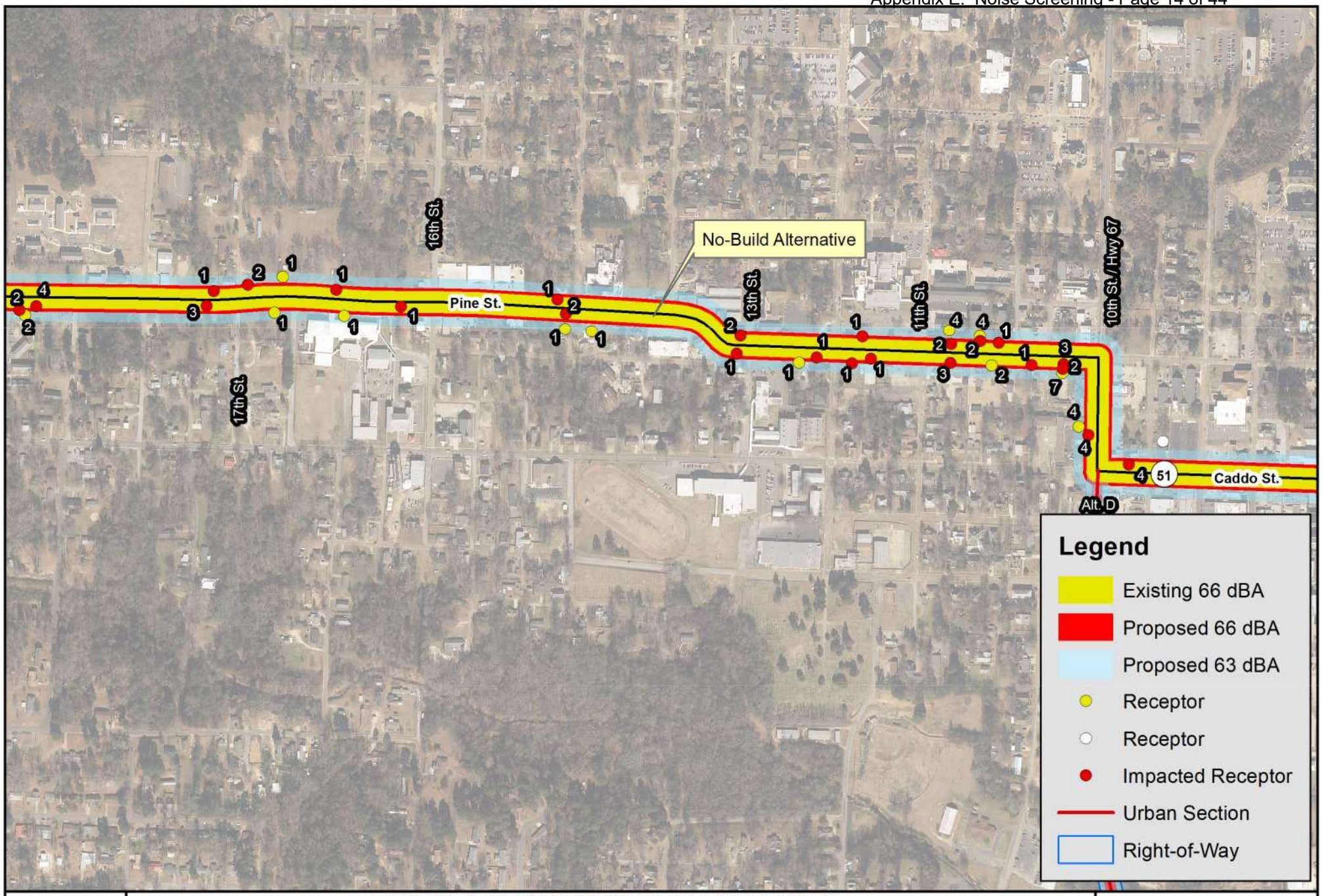
NOISE MEMO - 63 & 66 dB CONTOUR LINES - DETAILED VIEW

ARDOT Job No. 070442, Hwy. 67 to Hwy. 51 (Arkadelphia Bypass) P.E.
Arkadelphia, Clark County, Arkansas

2017 Aerial Image; ARKANSAS GIS OFFICE

0 200 400 600 800
Feet

Figure 2a



NOISE MEMO - 63 & 66 dB CONTOUR LINES - DETAILED VIEW

ARDOT Job No. 070442, Hwy. 67 to Hwy. 51 (Arkadelphia Bypass) P.E.
Arkadelphia, Clark County, Arkansas

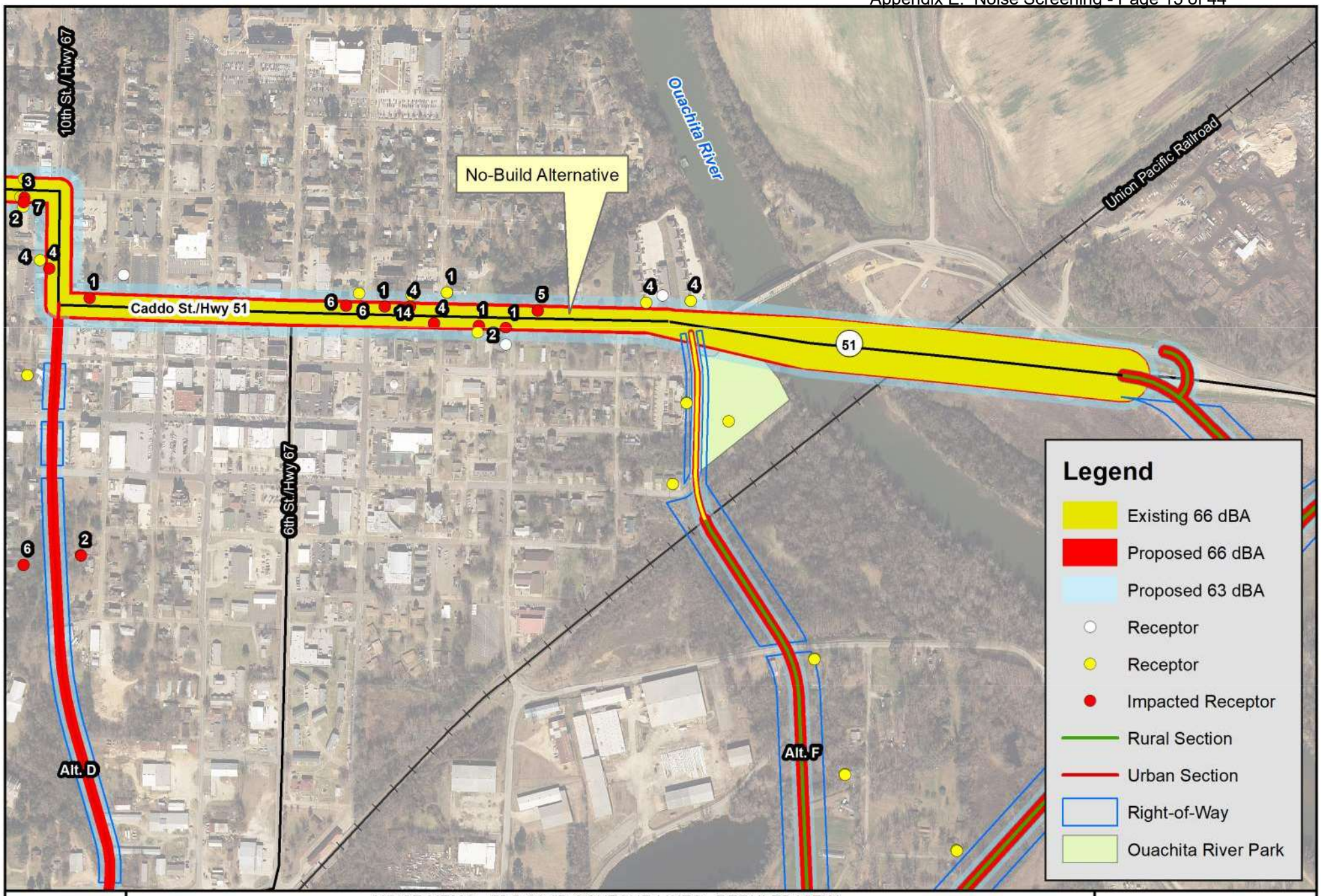
2017 Aerial Image; ARKANSAS GIS OFFICE

GARVER

N

0 200 400 600 800
Feet

Figure 3



GARVER

N

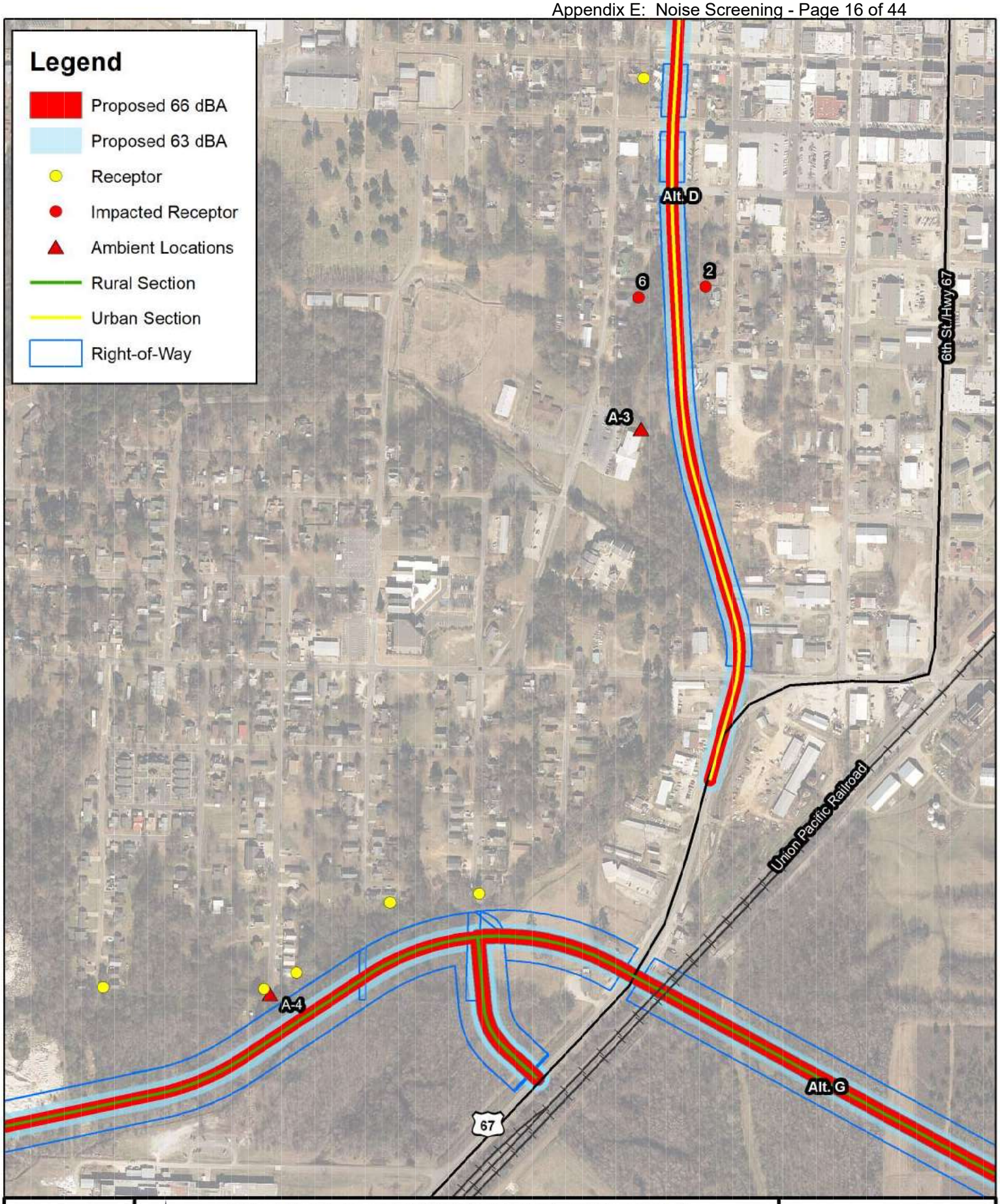
NOISE MEMO - 63 & 66 dB CONTOUR LINES - DETAILED VIEW

ARDOT Job No. 070442, Hwy. 67 to Hwy. 51 (Arkadelphia Bypass) P.E.
Arkadelphia, Clark County, Arkansas

2017 Aerial Image; ARKANSAS GIS OFFICE

0 200 400 600 800
Feet

Figure 4



GARVER

N

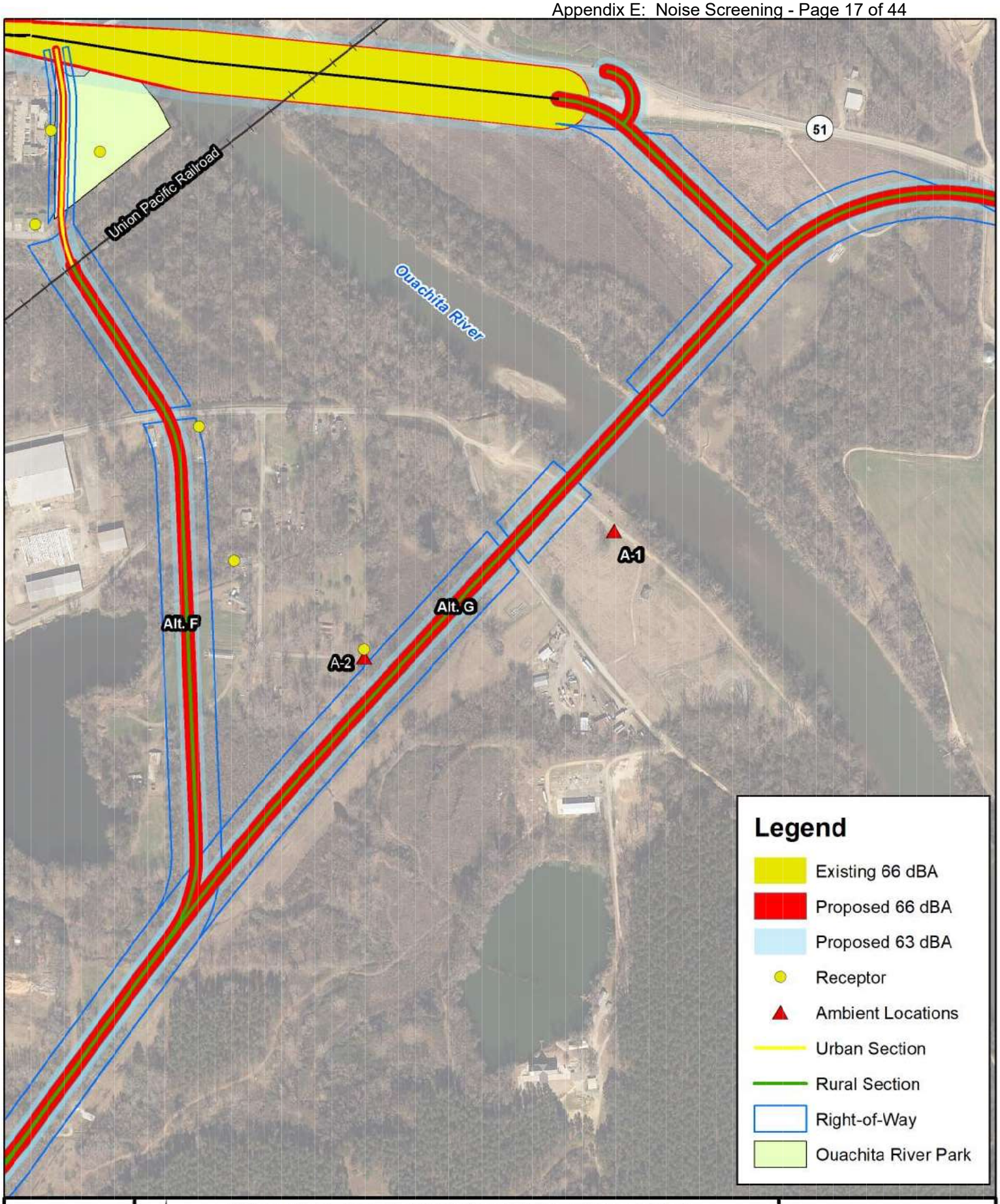
NOISE MEMO - 63 & 66 dB CONTOUR LINES - DETAILED VIEW

ARDOT Job No. 070442, Hwy. 67 to Hwy. 51 (Arkadelphia Bypass) P.E.
Arkadelphia, Clark County, Arkansas

2017 Aerial Image; ARKANSAS GIS OFFICE

0 200 400 600
Feet

Figure 5



GARVER

N

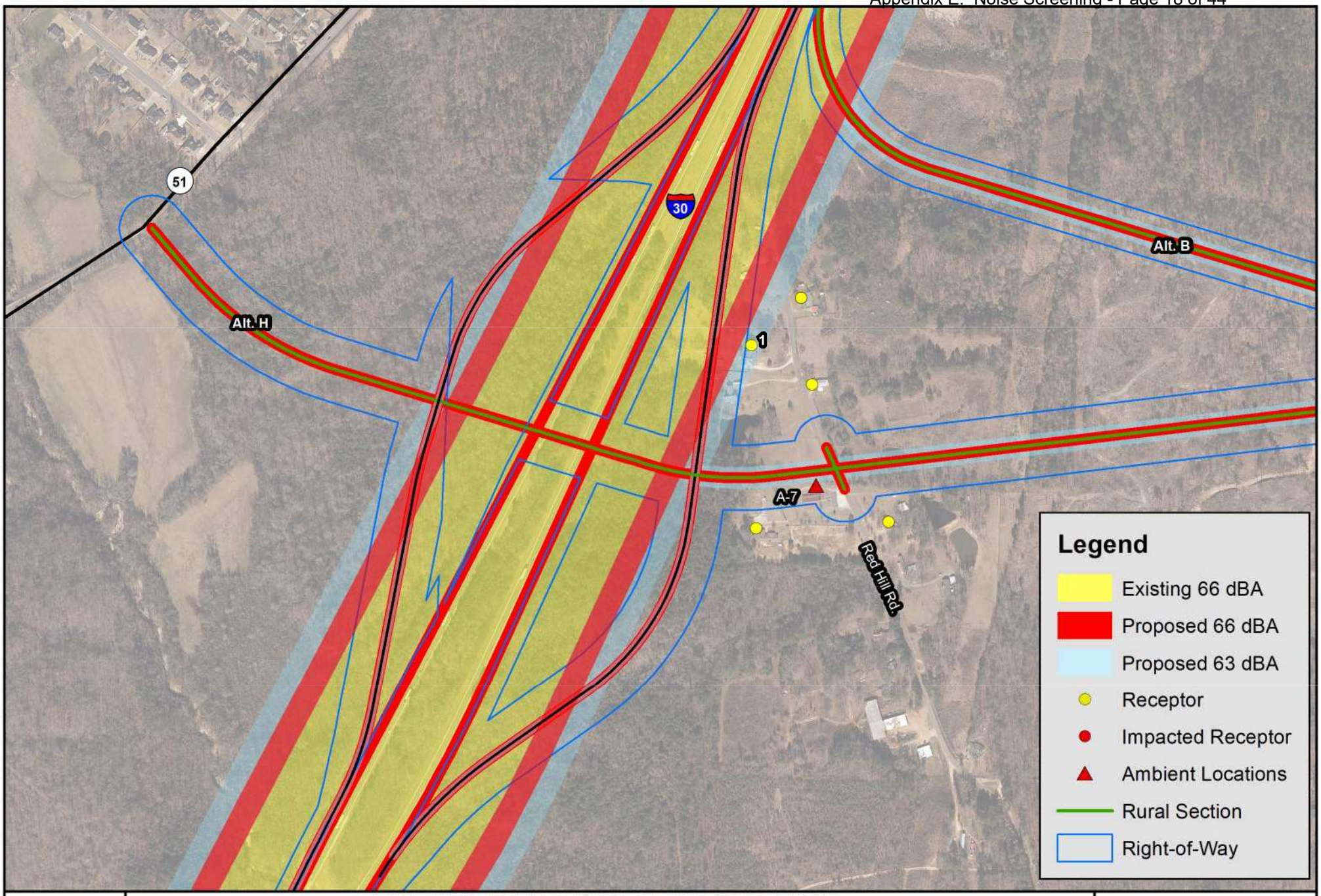
NOISE MEMO - 63 & 66 dB CONTOUR LINES - DETAILED VIEW

ARDOT Job No. 070442, Hwy. 67 to Hwy. 51 (Arkadelphia Bypass) P.E.
Arkadelphia, Clark County, Arkansas

2017 Aerial Image; ARKANSAS GIS OFFICE

0 200 400 600
Feet

Figure 6



GARVER

N

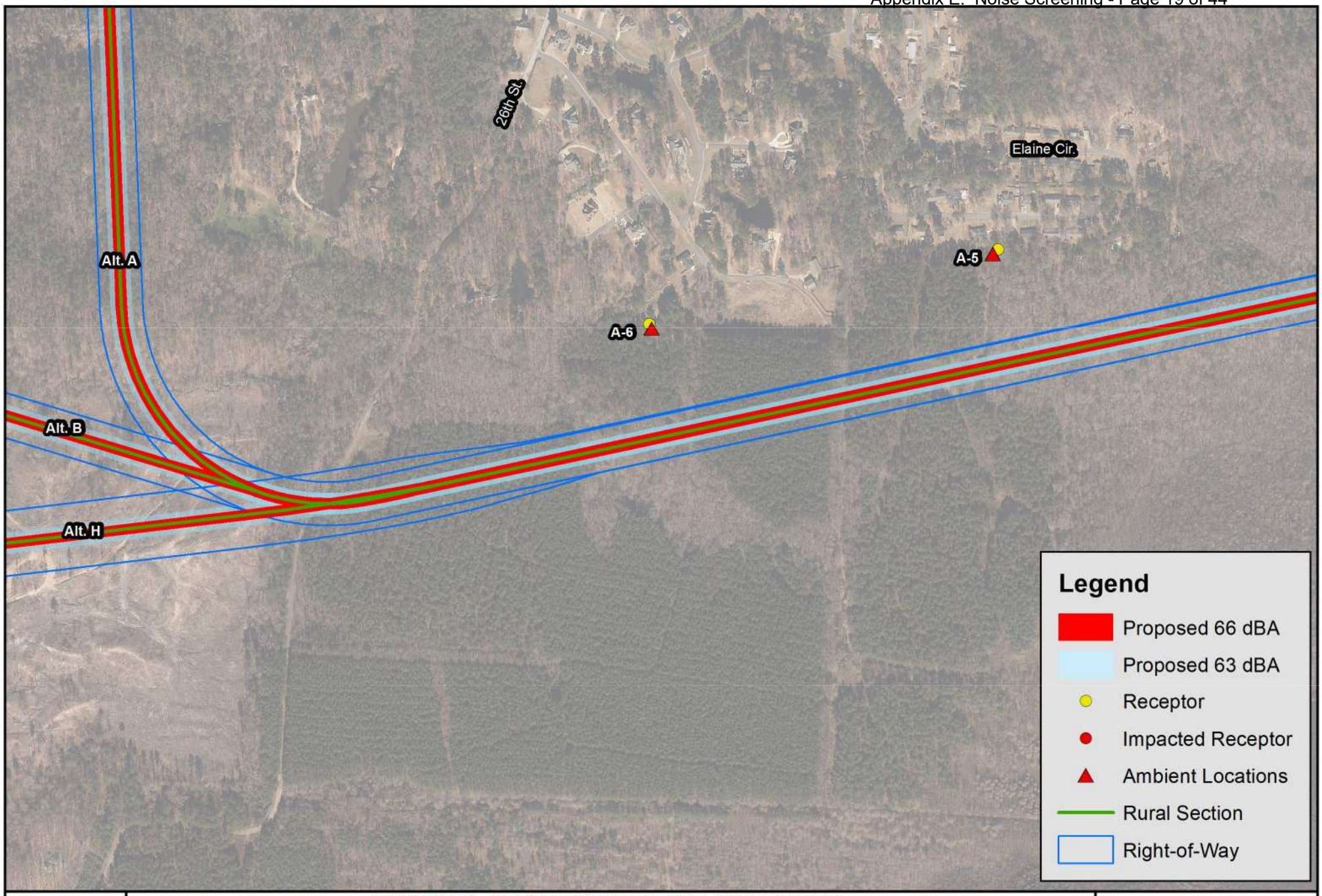
NOISE MEMO - 63 & 66 dB CONTOUR LINES - DETAILED VIEW

ARDOT Job No. 070442, Hwy. 67 to Hwy. 51 (Arkadelphia Bypass) P.E.
Arkadelphia, Clark County, Arkansas

2017 Aerial Image; ARKANSAS GIS OFFICE

0 200 400 600 800
Feet

Figure 7



GARVER

N

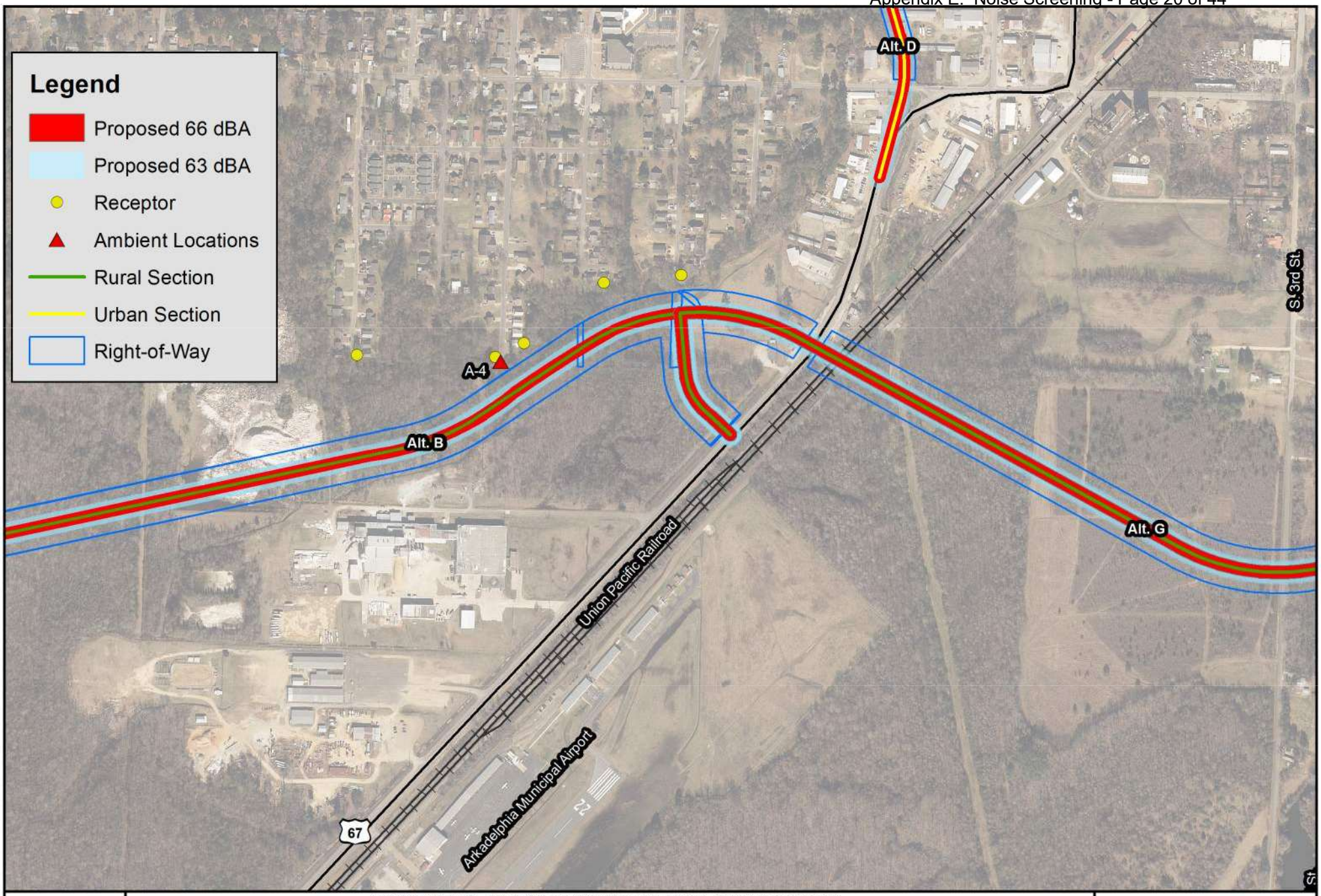
NOISE MEMO - 63 & 66 dB CONTOUR LINES - DETAILED VIEW

ARDOT Job No. 070442, Hwy. 67 to Hwy. 51 (Arkadelphia Bypass) P.E.
Arkadelphia, Clark County, Arkansas

2017 Aerial Image; ARKANSAS GIS OFFICE

0 200 400 600 800
Feet

Figure 8



NOISE MEMO - 63 & 66 dB CONTOUR LINES - DETAILED VIEW

ARDOT Job No. 070442, Hwy. 67 to Hwy. 51 (Arkadelphia Bypass) P.E.
Arkadelphia, Clark County, Arkansas

2017 Aerial Image; ARKANSAS GIS OFFICE

0 200 400 600 800
Feet

Figure 9

NOISE DATA WORKSHEET

Job No: 07442

Job Name: Hwy. 67 - Hwy. 51 (Arkadelphia Bypass) P.E.

Roadway Reference: Alt H - Proposed I-30 N. of Hwy 51, NB & S

County: Clark

Design Year: 2040

Year(s) To Be Modeled: 2018 2040

Roadway Cross-Sections: 64' wide-Three 12' travel lanes, 4' inside shldr & 12' outside shldr

2040 PROPOSED

Note: DHV = (ADT)(K)
DDHV = (ADT)(K)(D)
K - Percent of ADT occuring in design hour
D - Directional Distribution

Operating Speed: 70

Kfactor	11%	D	50%

Traffic Data:

YEAR	ADT	%TRUCK	DHV	CARS	MT	HT	CARS/2	MT/2	HT/2
					30%	70%			
2018	32,000	52%	3200	1536	499	1165	768	250	583
2040	38,100	52%	3800	1824	593	1383	912	297	692

I-30 – North of Hwy 51

Year	ADT	DHV	Truck %	MT30%	HT70%
2018	32,000	3,200	52	499.2	1164.8
2040	38,100	3,800	52	592.8	1383.2

Garver
Ryan Mountain

9-Jun-20
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND
PROJECT/CONTR/ Arkadelphia Bypass Screening
RUN: Alt H-I-30 N. of Hwy 51 NB & SB
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
50	1	1	0	81.3	66	81.3	10	Snd Lvl	81.3	0	8	-8
100	2	1	0	77.9	66	77.9	10	Snd Lvl	77.9	0	8	-8
150	3	1	0	75.8	66	75.8	10	Snd Lvl	75.8	0	8	-8
200	4	1	0	74.2	66	74.2	10	Snd Lvl	74.2	0	8	-8
250	5	1	0	72.9	66	72.9	10	Snd Lvl	72.9	0	8	-8
300	6	1	0	70.9	66	70.9	10	Snd Lvl	70.9	0	8	-8
325	7	1	0	69.9	66	69.9	10	Snd Lvl	69.9	0	8	-8
350	8	1	0	69.0	66	69	10	Snd Lvl	69	0	8	-8
375	11	1	0	68.2	66	68.2	10	Snd Lvl	68.2	0	8	-8
400	12	1	0	67.4	66	67.4	10	Snd Lvl	67.4	0	8	-8
425	13	1	0	66.7	66	66.7	10	Snd Lvl	66.7	0	8	-8
450	14	1	0	66.0	66	66.0	10	Snd Lvl	66	0	8	-8
475	15	1	0	65.3	66	65.3	10	----	65.3	0	8	-8
500	16	1	0	64.7	66	64.7	10	----	64.7	0	8	-8
525	18	1	0	64.1	66	64.1	10	----	64.1	0	8	-8
550	19	1	0	63.5	66	63.5	10	----	63.5	0	8	-8
575	20	1	0	63	66	63	10	----	63	0	8	-8
600	21	1	0	62.4	66	62.4	10	----	62.4	0	8	-8
625	23	1	0	61.9	66	61.9	10	----	61.9	0	8	-8

Dwelling Units	# DUs	Noise Reduction Min dB	Avg dB	Max dB
All Selected	19	0	0	0
All Impacted	12	0	0	0
All that meet NR Goal	0	0	0	0

NOISE DATA WORKSHEET

Job No: 07442

Job Name: Hwy. 67 - Hwy. 51 (Arkadelphia Bypass) P.E.

Roadway Reference: Alt A,B,H - Proposed Alignment Portion

County: Clark

Design Year: 2040

Year(s) To Be Modeled: 2018 2040

Roadway Cross-Sections: 32' wide - Two 12' travel lanes and 4' outside shoulders

2040 PROPOSED

Note: DHV = (ADT)(K)
DDHV = (ADT)(K)(D)
K - Percent of ADT occuring in design hour
D - Directional Distribution

Operating Speed: 55

Kfactor	11%	D	50%

Traffic Data:

YEAR	ADT	%TRUCK	DHV	CARS	MT	HT	CARS/2	MT/2	HT/2
					30%	70%			
				0	0	0	0	0	0
2040	1,600	3%	180	175	2	4	175	2	4

For the western portion between Walnut Street and 13th Street

Year	ADT	DHV	Truck %	MT30%	HT70%
2018	1,400	150	3	1.4	3.1
2040	1,600	180	3	1.6	3.8

Garver
Ryan Mountair

11-Jun-20
TNM 2.5
Calculated with TNM 2.5

RESULTS: SC
PROJECT/CO Arkadelphia Bypass Screening
RUN: Alt A, B, H - Proposed
BARRIER DES INPUT HEIGHTS

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

ATMOSPHER 68 deg F, 50% RH

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h	Calculated Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
20	1	1	0	67.2	66	67.2	10	Snd Lvl	67.2	0	8	-8
25	2	1	0	66.2	66	66.2	10	Snd Lvl	66.2	0	8	-8
30	3	1	0	65.3	66	65.3	10	---	65.3	0	8	-8
35	4	1	0	64.6	66	64.6	10	---	64.6	0	8	-8
40	5	1	0	63.9	66	63.9	10	---	63.9	0	8	-8
50	6	1	0	62.9	66	62.9	10	---	62.9	0	8	-8
60	7	1	0	62.0	66	62	10	---	62	0	8	-8
80	8	1	0	60.6	66	60.6	10	---	60.6	0	8	-8
100	11	1	0	59.4	66	59.4	10	---	59.4	0	8	-8
150	12	1	0	56.3	66	56.3	10	---	56.3	0	8	-8
165	13	1	0	55.2	66	55.2	10	---	55.2	0	8	-8
175	14	1	0	54.5	66	54.5	10	---	54.5	0	8	-8
200	15	1	0	52.9	66	52.9	10	---	52.9	0	8	-8
225	16	1	0	51.5	66	51.5	10	---	51.5	0	8	-8
300	18	1	0	48.1	66	48.1	10	---	48.1	0	8	-8
350	19	1	0	46.4	66	46.4	10	---	46.4	0	8	-8
400	20	1	0	44.9	66	44.9	10	---	44.9	0	8	-8
450	21	1	0	43.6	66	43.6	10	---	43.6	0	8	-8
500	22	1	0	42.4	66	42.4	10	---	42.4	0	8	-8
550	23	1	0	41.4	66	41.4	10	---	41.4	0	8	-8
600	24	1	0	40.4	66	40.4	10	---	40.4	0	8	-8

Dwelling Units	# DUs	Noise Reduction Min dB	Avg dB	Max dB
All Selected	21	0	0	0
All Impacted	2	0	0	0
All that meet NR Goal	0	0	0	0

NOISE DATA WORKSHEET

Job No: 07442

Job Name: Hwy. 67 - Hwy. 51 (Arkadelphia Bypass) P.E.

Roadway Reference: Alt A

County: Clark

Design Year: 2040

Year(s) To Be Modeled: 2018 2040

Roadway Cross-Sections: 32' wide - Two 12' travel lanes and 4' outside shoulders

2040 PROPOSED

Note: DHV = (ADT)(K)
DDHV = (ADT)(K)(D)
K - Percent of ADT occuring in design hour
D - Directional Distribution

Operating Speed: 55

Kfactor	11%	D	50%

Traffic Data:

YEAR	ADT	%TRUCK	DHV	CARS	MT	HT	CARS/2	MT/2	HT/2
					30%	70%			
				0	0	0	0	0	0
2040	1,600	3%	180	175	2	4	175	2	4

For the western portion between Walnut Street and 13th Street

Year	ADT	DHV	Truck %	MT30%	HT70%
2018	1,400	150	3	1.4	3.1
2040	1,600	180	3	1.6	3.8

Garver
Ryan Mountair

12-Jun-20
TNM 2.5
Calculated with TNM 2.5

RESULTS: SC
PROJECT/CO Arkadelphia Bypass Screening
RUN: Alt A
BARRIER DES INPUT HEIGHTS
ATMOSPHER 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h	Calculated Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
20	1	1	0	67.2	66	67.2	10	Snd Lvl	67.2	0	8	-8
25	2	1	0	66.2	66	66.2	10	Snd Lvl	66.2	0	8	-8
30	3	1	0	65.3	66	65.3	10	---	65.3	0	8	-8
35	4	1	0	64.6	66	64.6	10	---	64.6	0	8	-8
40	5	1	0	63.9	66	63.9	10	---	63.9	0	8	-8
50	6	1	0	62.9	66	62.9	10	---	62.9	0	8	-8
60	7	1	0	62.0	66	62	10	---	62	0	8	-8
80	8	1	0	60.6	66	60.6	10	---	60.6	0	8	-8
100	11	1	0	59.4	66	59.4	10	---	59.4	0	8	-8
150	12	1	0	56.3	66	56.3	10	---	56.3	0	8	-8
165	13	1	0	55.2	66	55.2	10	---	55.2	0	8	-8
175	14	1	0	54.5	66	54.5	10	---	54.5	0	8	-8
200	15	1	0	52.9	66	52.9	10	---	52.9	0	8	-8
225	16	1	0	51.5	66	51.5	10	---	51.5	0	8	-8
300	18	1	0	48.1	66	48.1	10	---	48.1	0	8	-8
350	19	1	0	46.4	66	46.4	10	---	46.4	0	8	-8
400	20	1	0	44.9	66	44.9	10	---	44.9	0	8	-8
450	21	1	0	43.6	66	43.6	10	---	43.6	0	8	-8
500	22	1	0	42.4	66	42.4	10	---	42.4	0	8	-8
550	23	1	0	41.4	66	41.4	10	---	41.4	0	8	-8
600	24	1	0	40.4	66	40.4	10	---	40.4	0	8	-8

Dwelling Units	# DUs	Noise Reduction Min dB	Avg dB	Max dB
All Selected	21	0	0	0
All Impacted	2	0	0	0
All that meet NR Goal	0	0	0	0

NOISE DATA WORKSHEET

Job No: 07442

Job Name: Hwy. 67 - Hwy. 51 (Arkadelphia Bypass) P.E.

Roadway Reference: Alt D

County: Clark

Design Year: 2040

Year(s) To Be Modeled: 2018 2040

Roadway Cross-Sections: 28' Wide - Two 12' lanes with curb & gutter

2040 PROPOSED

Note: DHV = (ADT)(K)
DDHV = (ADT)(K)(D)
K - Percent of ADT occuring in design hour
D - Directional Distribution

Operating Speed: 45

Kfactor	10%	D	50%

Traffic Data:

YEAR	ADT	%TRUCK	DHV	CARS	MT	HT	CARS/2	MT/2	HT/2
					30%	70%			
				0	0	0	0	0	0
2040	3,000	4%	300	288	4	8	288	4	9

For Alt D, assuming this is the only bypass improvement
For the eastern portion of the bypass:

Year	ADT	DHV	Truck %	MT30%	HT70%
2018	2000	200	4	2.4	5.6
2040	3000	300	4	3.6	8.4

Garver
Ryan Mountai

2-Jun-20
TNM 2.5
Calculated with TNM 2.5

RESULTS: SC
PROJECT/CO Arkadelphia Bypass Screening
RUN: Alt D - Proposed
BARRIER DES INPUT HEIGHTS

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

ATMOSPHER 68 deg F, 50% RH

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h	Calculated Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
15	1	1	0	68.0	66	68	10	Snd Lvl	68	0	8	-8
20	2	1	0	67.0	66	67	10	Snd Lvl	67	0	8	-8
25	3	1	0	66.1	66	66.1	10	Snd Lvl	66.1	0	8	-8
30	4	1	0	65.2	66	65.2	10	----	65.2	0	8	-8
40	5	1	0	63.8	66	63.8	10	----	63.8	0	8	-8
50	6	1	0	62.7	66	62.7	10	----	62.7	0	8	-8
60	7	1	0	61.9	66	61.9	10	----	61.9	0	8	-8
80	8	1	0	60.5	66	60.5	10	----	60.5	0	8	-8
100	11	1	0	59.3	66	59.3	10	----	59.3	0	8	-8
125	12	1	0	57.6	66	57.6	10	----	57.6	0	8	-8
150	13	1	0	55.6	66	55.6	10	----	55.6	0	8	-8
175	14	1	45	53.8	66	8.8	10	----	53.8	0	8	-8
200	15	1	0	52.4	66	52.4	10	----	52.4	0	8	-8
225	16	1	0	51.1	66	51.1	10	----	51.1	0	8	-8

Dwelling Units	# DUs	Noise Reduction Min dB	Avg dB	Max dB
All Selected	14	0	0	0
All Impacted	3	0	0	0
All that meet NR Goal	0	0	0	0

NOISE DATA WORKSHEET

Job No: 07442

Job Name: Hwy. 67 - Hwy. 51 (Arkadelphia Bypass) P.E.

Roadway Reference: Alt F - New Alignment Portion

County: Clark

Design Year: 2040

Year(s) To Be Modeled: 2018 2040

Roadway Cross-Sections: 28' Wide - Two 12' lanes with curb & gutter

2040 PROPOSED

Note: DHV = (ADT)(K)
DDHV = (ADT)(K)(D)
K - Percent of ADT occuring in design hour
D - Directional Distribution

Operating Speed: 45

Kfactor	10%	D	50%

Traffic Data:

YEAR	ADT	%TRUCK	DHV	CARS	MT	HT	CARS/2	MT/2	HT/2
					30%	70%			
				0	0	0	0	0	0
2040	1,200	32%	120	82	12	27	82	12	27

For the eastern portion of the bypass:

Year	ADT	DHV	Truck %	MT30%	HT70%
2018	1,000	100	4	1.2	2.8
2040	1,200	120	32	11.5	26.9

Garver
Ryan Mountain

2-Jun-20
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUI
PROJECT/CONT Arkadelphia Bypass Screening
RUN: Alt F - Proposed
BARRIER DESIC INPUT HEIGHTS

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

ATMOSPHERIC: 68 deg F, 50% RH

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h		Increase over existing		Type	With Barrier Calculated	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc	Impact	LAeq1h	Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
27	1	1	0	66.0	66	66	10	Snd Lvl	66	0	8	-8
30	2	1	0	65.5	66	65.5	10	----	65.5	0	8	-8
35	3	1	0	64.8	66	64.8	10	----	64.8	0	8	-8
40	4	1	0	64.1	66	64.1	10	----	64.1	0	8	-8
45	5	1	0	63.5	66	63.5	10	----	63.5	0	8	-8
50	6	1	0	63.0	66	63	10	----	63	0	8	-8
60	7	1	0	62.5	66	62.5	10	----	62.5	0	8	-8
70	8	1	0	60.7	66	60.7	10	----	60.7	0	8	-8
100	11	1	0	59.6	66	59.6	10	----	59.6	0	8	-8
120	12	1	0	58.7	66	58.7	10	----	58.7	0	8	-8
140	13	1	0	57.5	66	57.5	10	----	57.5	0	8	-8
160	14	1	0	56.9	66	56.9	10	----	56.9	0	8	-8
180	15	1	0	56.8	66	56.8	10	----	56.8	0	8	-8
200	16	1	0	53.9	66	53.9	10	----	53.9	0	8	-8

Dwelling Units	# DUs	Noise Reduction Min dB	Avg dB	Max dB
All Selected	14	0	0	0
All Impacted	1	0	0	0
All that meet NR Goal	0	0	0	0

NOISE DATA WORKSHEET

Job No: 07442

Job Name: Hwy. 67 - Hwy. 51 (Arkadelphia Bypass) P.E.

Roadway Reference: Alt F - 1st St. Existing Alignment Portion

County: Clark

Design Year: 2040

Year(s) To Be Modeled: 2018 2040

Roadway Cross-Sections: 38' Wide - Two 12' lanes w/ C&G, park lane, side walk

2018 EXISTING

Note: DHV = (ADT)(K)
DDHV = (ADT)(K)(D)
K - Percent of ADT occuring in design hour
D - Directional Distribution

Operating Speed: 25

Kfactor	10%	D	50%

Traffic Data:

YEAR	ADT	%TRUCK	DHV	CARS	MT	HT	CARS/2	MT/2	HT/2
					30%	70%			
2018	1,220	32%	110	75	11	25	75	11	25
2040	1,000	32%	100	68	10	22	68	10	23

Alternative F: 1st Street

Year	ADT	DHV	Truck %	MT30%	HT70%
2018	1220	110	32	10	25
2040	1450	130	32	13	28

Garver
Ryan Mountain

11-Jun-20
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND L
PROJECT/CONTRA(Arkadelphia Bypass Screening
RUN: Alt F - Existing
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n	Type Impact Sub'l Inc	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
20	1	1	0	64.3	66	64.3	10	----	64.3	0	8	-8
25	2	1	0	63.2	66	63.2	10	----	63.2	0	8	-8
30	3	1	0	62.1	66	62.1	10	----	62.1	0	8	-8
35	4	1	0	61.3	66	61.3	10	----	61.3	0	8	-8
40	5	1	0	60.6	66	60.6	10	----	60.6	0	8	-8
45	6	1	0	60.0	66	60	10	----	60	0	8	-8
50	7	1	0	59.4	66	59.4	10	----	59.4	0	8	-8
60	8	1	0	58.6	66	58.6	10	----	58.6	0	8	-8
70	11	1	0	57.9	66	57.9	10	----	57.9	0	8	-8
80	12	1	0	57.2	66	57.2	10	----	57.2	0	8	-8
90	13	1	0	56.7	66	56.7	10	----	56.7	0	8	-8
100	14	1	0	56.1	66	56.1	10	----	56.1	0	8	-8
120	15	1	0	55.3	66	55.3	10	----	55.3	0	8	-8
130	16	1	0	54.8	66	54.8	10	----	54.8	0	8	-8
140	18	1	0	54.5	66	54.5	10	----	54.5	0	8	-8
150	19	1	0	54.1	66	54.1	10	----	54.1	0	8	-8
160	20	1	0	53.6	66	53.6	10	----	53.6	0	8	-8
200	21	1	0	51.5	66	51.5	10	----	51.5	0	8	-8
300	22	1	0	47.9	66	47.9	10	----	47.9	0	8	-8
400	23	1	0	45.5	66	45.5	10	----	45.5	0	8	-8

Dwelling Units	# DUs	Noise Reduction Min dB	Avg dB	Max dB
All Selected	20	0	0	0
All Impacted	0	0	0	0
All that meet NR Goal	0	0	0	0

NOISE DATA WORKSHEET

Job No: 07442

Job Name: Hwy. 67 - Hwy. 51 (Arkadelphia Bypass) P.E.

Roadway Reference: Alt F - 1st St. Alignment Portion

County: Clark

Design Year: 2040

Year(s) To Be Modeled: 2018 | 2040

Roadway Cross-Sections: 28' Wide - Two 12' lanes w/ C&G

2040 | PROPOSED

Note: DHV = (ADT)(K)
DDHV = (ADT)(K)(D)
K - Percent of ADT occuring in design hour
D - Directional Distribution

Operating Speed: 25

Kfactor	10%	D	50%

Traffic Data:

YEAR	ADT	%TRUCK	DHV	CARS	MT	HT	CARS/2	MT/2	HT/2
					30%	70%			
2018	1,220	32%	110	75	11	25	75	11	25
2040	1,000	32%	100	68	10	22	68	10	23

Alternative F: 1st Street

Year	ADT	DHV	Truck %	MT30%	HT70%
2018	1220	110	32	10	25
2040	1450	130	32	13	28

Garver
Ryan Mountain

11-Jun-20
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUN
PROJECT/CONTI Arkadelphia Bypass Screening
RUN: Alt F - 1st St. Proposed
BARRIER DESIGI INPUT HEIGHTS

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

ATMOSPHERICS 68 deg F, 50% RH

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n	Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB		dB		dBA	dB	dB	dB
15	1	1	0	64.8	66	64.8	10	----		64.8	0	8	-8
25	2	1	0	62.6	66	62.6	10	----		62.6	0	8	-8
30	3	1	0	61.7	66	61.7	10	----		61.7	0	8	-8
35	4	1	0	60.9	66	60.9	10	----		60.9	0	8	-8
40	5	1	0	60.2	66	60.2	10	----		60.2	0	8	-8
45	6	1	0	59.6	66	59.6	10	----		59.6	0	8	-8
50	7	1	0	59.1	66	59.1	10	----		59.1	0	8	-8
60	8	1	0	58.2	66	58.2	10	----		58.2	0	8	-8
70	11	1	0	57.5	66	57.5	10	----		57.5	0	8	-8
80	12	1	0	56.8	66	56.8	10	----		56.8	0	8	-8
90	13	1	0	56.3	66	56.3	10	----		56.3	0	8	-8
100	14	1	0	55.7	66	55.7	10	----		55.7	0	8	-8
120	15	1	0	54.6	66	54.6	10	----		54.6	0	8	-8
130	16	1	0	53.9	66	53.9	10	----		53.9	0	8	-8
140	18	1	0	53.3	66	53.3	10	----		53.3	0	8	-8
150	19	1	0	52.7	66	52.7	10	----		52.7	0	8	-8
160	20	1	0	52.1	66	52.1	10	----		52.1	0	8	-8
200	21	1	0	50.3	66	50.3	10	----		50.3	0	8	-8
300	22	1	0	47	66	47	10	----		47	0	8	-8
400	23	1	0	44.8	66	44.8	10	----		44.8	0	8	-8

Dwelling Units	# DUs	Noise Reduction Min dB	Avg dB	Max dB
All Selected	20	0	0	0
All Impacted	0	0	0	0
All that meet NR Goal	0	0	0	0

NOISE DATA WORKSHEET

Job No: 07442

Job Name: Hwy. 67 - Hwy. 51 (Arkadelphia Bypass) P.E.

Roadway Reference: Alt F - Hemphill Rd.

County: Clark

Design Year: 2040

Year(s) To Be Modeled: 2018 2040

Roadway Cross-Sections: 20' Wide - Two 10' lanes with no shldr

2018 EXISTING

Note: DHV = (ADT)(K)
DDHV = (ADT)(K)(D)
K - Percent of ADT occuring in design hour
D - Directional Distribution

Operating Speed:

Kfactor	10%	D	50%

Traffic Data:

YEAR	ADT	%TRUCK	DHV	CARS	MT	HT	CARS/2	MT/2	HT/2
					30%	70%			
2018	100	1%	100	99	0	1	99	1	1
	0	0%	0	0	0	0	0	0	0

Alternative F: Hemphill Road*

Year	ADT	DHV	Truck %	MT30%	HT70%
2018	100	10	1	.03	.07
2040	130	12	1	.04	.08

*These volumes are a educated guess based on nearby traffic volumes and the lack of connectivity on the east end of Hemphill Road.

Garver
Ryan Mountai

9-Jun-20
TNM 2.5
Calculated with TNM 2.5

RESULTS: SC
PROJECT/CO Arkadelphia Bypass Screening
RUN: Alt F @ Hemphill
BARRIER DES INPUT HEIGHTS

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

ATMOSPHER 68 deg F, 50% RH

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h	Calculated Crit'n	Increase over existing Calculated	Crit'n	Type Impact Sub'l Inc	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
20	1	1	0	54.9	66	54.9	10	----	54.9	0	8	-8
25	2	1	0	54.0	66	54	10	----	54	0	8	-8
30	3	1	0	53.2	66	53.2	10	----	53.2	0	8	-8
35	4	1	0	52.4	66	52.4	10	----	52.4	0	8	-8
40	5	1	0	51.8	66	51.8	10	----	51.8	0	8	-8
45	6	1	0	51.2	66	51.2	10	----	51.2	0	8	-8
50	7	1	0	50.7	66	50.7	10	----	50.7	0	8	-8
60	8	1	0	49.8	66	49.8	10	----	49.8	0	8	-8
70	11	1	0	49.1	66	49.1	10	----	49.1	0	8	-8
80	12	1	0	48.4	66	48.4	10	----	48.4	0	8	-8
90	13	1	0	47.4	66	47.4	10	----	47.4	0	8	-8
100	14	1	0	46.3	66	46.3	10	----	46.3	0	8	-8
120	15	1	0	44.5	66	44.5	10	----	44.5	0	8	-8
130	16	1	0	43.8	66	43.8	10	----	43.8	0	8	-8

Dwelling Units	# DUs	Noise Reduction Min dB	Avg dB	Max dB
All Selected	14	0	0	0
All Impacted	0	0	0	0
All that meet NR Goal	0	0	0	0

NOISE DATA WORKSHEET

Job No: 07442

Job Name: Hwy. 67 - Hwy. 51 (Arkadelphia Bypass) P.E.

Roadway Reference: Alt G - New Alignment

County: Clark

Design Year: 2040

Year(s) To Be Modeled: 2018 2040

Roadway Cross-Sections: 32' Wide - Two 12' lanes with 4' shoulders

2040 PROPOSED

Note: DHV = (ADT)(K)
DDHV = (ADT)(K)(D)
K - Percent of ADT occuring in design hour
D - Directional Distribution

Operating Speed: 55

Kfactor	10%	D	50%

Traffic Data:

YEAR	ADT	%TRUCK	DHV	CARS	MT	HT	CARS/2	MT/2	HT/2
					30%	70%			
				0	0	0	0	0	0
2040	1,100	20%	110	88	7	15	88	7	16

For Alt G, assuming the western portion of the bypass is also constructed
For the eastern portion of the bypass:

Year	ADT	DHV	Truck %	MT30%	HT70%
2018	1000	100	20	6	14
2040	1100	110	20	6.6	15.4

Garver
Ryan Mountai

2-Jun-20
TNM 2.5
Calculated with TNM 2.5

RESULTS: SC
PROJECT/CO Arkadelphia Bypass Screening
RUN: Alt. G - Proposed
BARRIER DES INPUT HEIGHTS

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

ATMOSPHER 68 deg F, 50% RH

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
29	1	1	0	66.1	66	66.1	10	Snd Lvl	66.1	0	8	-8
30	2	1	0	66.0	66	66.0	10	Snd Lvl	66	0	8	-8
35	3	1	0	65.2	66	65.2	10	--	65.2	0	8	-8
40	4	1	0	64.6	66	64.6	10	--	64.6	0	8	-8
45	5	1	0	64.0	66	64.0	10	--	64	0	8	-8
50	6	1	0	63.5	66	63.5	10	--	63.5	0	8	-8
55	7	1	0	63.0	66	63.0	10	--	63	0	8	-8
80	8	1	0	61.2	66	61.2	10	--	61.2	0	8	-8
100	11	1	0	60.1	66	60.1	10	--	60.1	0	8	-8
120	12	1	0	59.2	66	59.2	10	--	59.1	0	8	-8
140	13	1	0	57.9	66	57.9	10	--	57.9	0	8	-8
148	14	1	48.4	57.3	66	8.9	10	--	57.3	0	8	-8
150	15	1	0	57.2	66	57.2	10	--	57.2	0	8	-8
200	16	1	0	54.1	66	54.1	10	--	54.1	0	8	-8

Dwelling Units	# DUs	Noise Reduction Min dB	Avg dB	Max dB
All Selected	14	0	0	0
All Impacted	2	0	0	0
All that meet NR Goal	0	0	0	0

NOISE DATA WORKSHEET

Job No: 07442

Job Name: Hwy. 67 - Hwy. 51 (Arkadelphia Bypass) P.E.

Roadway Reference: Alt H - Existing I-30 NB N. of Hwy 51

County: Clark

Design Year: 2040

Year(s) To Be Modeled: 2018 | 2040

Roadway Cross-Sections: 40' wide-Two 12' travel lanes, 4' inside shldr & 12' outside shldr

2018 EXISTING

Note: DHV = (ADT)(K)
DDHV = (ADT)(K)(D)
K - Percent of ADT occuring in design hour
D - Directional Distribution

Operating Speed: 70

Kfactor	11%	D	50%

Traffic Data:

YEAR	ADT	%TRUCK	DHV	CARS	MT	HT	CARS/2	MT/2	HT/2
					30%	70%			
2018	32,000	52%	3200	1536	499	1165	768	250	583
2040	38,100	52%	3800	1824	593	1383	912	297	692

I-30 – North of Hwy 51

Year	ADT	DHV	Truck %	MT30%	HT70%
2018	32,000	3,200	52	499.2	1164.8
2040	38,100	3,800	52	592.8	1383.2

Garver
Ryan Mountair

9-Jun-20
TNM 2.5
Calculated with TNM 2.5

RESULTS: SC
PROJECT/CO Arkadelphia Bypass Screening
RUN: Alt H-I-30 N. of 51 NB& SB Existing
BARRIER DES INPUT HEIGHTS

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

ATMOSPHER 68 deg F, 50% RH

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h	Calculated Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
50	1	1	0	80.5	66	80.5	10	Snd Lvl	80.5	0	8	-8
75	2	1	0	78.6	66	78.6	10	Snd Lvl	78.6	0	8	-8
100	3	1	0	77.1	66	77.1	10	Snd Lvl	77.1	0	8	-8
125	4	1	0	76.0	66	76	10	Snd Lvl	76	0	8	-8
150	5	1	0	75.0	66	75	10	Snd Lvl	75	0	8	-8
175	6	1	0	73.7	66	73.7	10	Snd Lvl	73.7	0	8	-8
200	7	1	0	72.3	66	72.3	10	Snd Lvl	72.3	0	8	-8
225	8	1	0	71.0	66	71	10	Snd Lvl	71	0	8	-8
250	11	1	0	69.8	66	69.8	10	Snd Lvl	69.8	0	8	-8
275	12	1	0	68.8	66	68.8	10	Snd Lvl	68.8	0	8	-8
300	13	1	0	67.9	66	67.9	10	Snd Lvl	67.9	0	8	-8
325	14	1	0	67.0	66	67.0	10	Snd Lvl	67	0	8	-8
350	15	1	0	66.2	66	66.2	10	Snd Lvl	66.2	0	8	-8
375	16	1	0	65.5	66	65.5	10	----	65.5	0	8	-8
400	18	1	0	64.8	66	64.8	10	----	64.8	0	8	-8
425	19	1	0	64.1	66	64.1	10	----	64.1	0	8	-8
450	20	1	0	63.5	66	63.5	10	----	63.5	0	8	-8
475	21	1	0	62.9	66	62.9	10	----	62.9	0	8	-8
500	23	1	0	62.4	66	62.4	10	----	62.4	0	8	-8

Dwelling Units	# DUs	Noise Reduction Min dB	Avg dB	Max dB
All Selected	19	0	0	0
All Impacted	13	0	0	0
All that meet NR Goal	0	0	0	0

NOISE DATA WORKSHEET

Job No: 07442

Job Name: Hwy. 67 - Hwy. 51 (Arkadelphia Bypass) P.E.

Roadway Reference: Alt H - Existing I-30 NB S. of Hwy 51

County: Clark

Design Year: 2040

Year(s) To Be Modeled: 2018 | 2040

Roadway Cross-Sections: 40' wide-Two 12' travel lanes, 4' inside shldr & 12' outside shldr

2018 | EXISTING

Note: DHV = (ADT)(K)
DDHV = (ADT)(K)(D)
K - Percent of ADT occuring in design hour
D - Directional Distribution

Operating Speed: 70

Kfactor	11%	D	50%

Traffic Data:

YEAR	ADT	%TRUCK	DHV	CARS	MT	HT	CARS/2	MT/2	HT/2
					30%	70%			
2018	29,000	53%	2900	1363	461	1076	682	231	538
2040	34,500	53%	3500	1645	557	1299	823	279	650

I-30 – South of Hwy 51

Year	ADT	DHV	Truck %	MT30%	HT70%
2018	29,000	2,900	53	461.1	1075.9
2040	34,500	3,500	53	556.5	1298.5

Garver
Ryan Mountair

2-Jun-20
TNM 2.5
Calculated with TNM 2.5

RESULTS: SC
PROJECT/CO Arkadelphia Bypass Screening
RUN: Alt H-I-30 NB&SB Existing
BARRIER DES INPUT HEIGHTS

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

ATMOSPHER 68 deg F, 50% RH

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h	Calculated Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
50	1	1	0	80.2	66	80.2	10	Snd Lvl	80.2	0	8	-8
75	2	1	0	78.2	66	78.2	10	Snd Lvl	78.2	0	8	-8
100	3	1	0	76.8	66	76.8	10	Snd Lvl	76.8	0	8	-8
125	4	1	0	75.6	66	75.6	10	Snd Lvl	75.6	0	8	-8
150	5	1	0	74.6	66	74.6	10	Snd Lvl	74.6	0	8	-8
175	6	1	0	73.4	66	73.4	10	Snd Lvl	73.4	0	8	-8
200	7	1	0	71.9	66	71.9	10	Snd Lvl	71.9	0	8	-8
225	8	1	0	70.6	66	70.6	10	Snd Lvl	70.6	0	8	-8
250	11	1	0	69.5	66	69.5	10	Snd Lvl	69.5	0	8	-8
275	12	1	0	68.4	66	68.4	10	Snd Lvl	68.4	0	8	-8
300	13	1	0	67.5	66	67.5	10	Snd Lvl	67.5	0	8	-8
325	14	1	0	66.6	66	66.6	10	Snd Lvl	66.6	0	8	-8
350	15	1	0	65.8	66	65.8	10	----	65.8	0	8	-8
375	16	1	0	65.1	66	65.1	10	----	65.1	0	8	-8
400	18	1	0	64.4	66	64.4	10	----	64.4	0	8	-8
425	19	1	0	63.8	66	63.8	10	----	63.8	0	8	-8
450	20	1	0	63.1	66	63.1	10	----	63.1	0	8	-8
475	21	1	0	62.6	66	62.6	10	----	62.6	0	8	-8
500	23	1	0	62	66	62	10	----	62	0	8	-8

Dwelling Units	# DUs	Noise Reduction Min dB	Avg dB	Max dB
All Selected	19	0	0	0
All Impacted	12	0	0	0
All that meet NR Goal	0	0	0	0

NOISE DATA WORKSHEET

Job No: 07442

Job Name: Hwy. 67 - Hwy. 51 (Arkadelphia Bypass) P.E.

Roadway Reference: Alt H - I-30 Proposed S. of Hwy 51 NB & SB

County: Clark

Design Year: 2040

Year(s) To Be Modeled: 2018 | 2040

Roadway Cross-Sections: 64' wide-Three 12' travel lanes, 4' inside shldr & 12' outside shldr

2018 | EXISTING

Note: DHV = (ADT)(K)
DDHV = (ADT)(K)(D)
K - Percent of ADT occuring in design hour
D - Directional Distribution

Operating Speed: 70

Kfactor	11%	D	50%

Traffic Data:

YEAR	ADT	%TRUCK	DHV	CARS	MT	HT	CARS/2	MT/2	HT/2
					30%	70%			
2018	29,000	53%	2900	1363	461	1076	682	231	538
2040	34,500	53%	3500	1645	557	1299	823	279	650

I-30 – South of Hwy 51

Year	ADT	DHV	Truck %	MT30%	HT70%
2018	29,000	2,900	53	461.1	1075.9
2040	34,500	3,500	53	556.5	1298.5

Garver
Ryan Mountair

12-Jun-20
TNM 2.5
Calculated with TNM 2.5

RESULTS: SC
PROJECT/CO Arkadelphia Bypass Screening
RUN: Alt H-I-30S NB & SB Proposed
BARRIER DES INPUT HEIGHTS

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

ATMOSPHER 68 deg F, 50% RH

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n	Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB			dBA	dB	dB	dB
50	1	1	0	81	66	81	10		Snd Lvl	81	0	8	-8
100	2	1	0	77.6	66	77.6	10		Snd Lvl	77.6	0	8	-8
150	3	1	0	75.5	66	75.5	10		Snd Lvl	75.5	0	8	-8
200	4	1	0	73.9	66	73.9	10		Snd Lvl	73.9	0	8	-8
250	5	1	0	72.6	66	72.6	10		Snd Lvl	72.6	0	8	-8
300	6	1	0	70.6	66	70.6	10		Snd Lvl	70.6	0	8	-8
325	7	1	0	69.6	66	69.6	10		Snd Lvl	69.6	0	8	-8
350	8	1	0	68.7	66	68.7	10		Snd Lvl	68.7	0	8	-8
375	11	1	0	67.9	66	67.9	10		Snd Lvl	67.9	0	8	-8
400	12	1	0	67.1	66	67.1	10		Snd Lvl	67.1	0	8	-8
425	13	1	0	66.4	66	66.4	10		Snd Lvl	66.4	0	8	-8
450	14	1	0	65.7	66	65.7	10		----	65.7	0	8	-8
475	15	1	0	65	66	65	10		----	65	0	8	-8
500	16	1	0	64.4	66	64.4	10		----	64.4	0	8	-8
525	18	1	0	63.8	66	63.8	10		----	63.8	0	8	-8
550	19	1	0	63.2	66	63.2	10		----	63.2	0	8	-8
575	20	1	0	62.7	66	62.7	10		----	62.7	0	8	-8
600	21	1	0	62.1	66	62.1	10		----	62.1	0	8	-8
625	23	1	0	61.6	66	61.6	10		----	61.6	0	8	-8

Dwelling Units	# DUs	Noise Reduction Min dB	Avg dB	Max dB
All Selected	19	0	0	0
All Impacted	11	0	0	0
All that meet NR Goal	0	0	0	0

NOISE DATA WORKSHEET

Job No: 07442

Job Name: Hwy. 67 - Hwy. 51 (Arkadelphia Bypass) P.E.

Roadway Reference: Alt H - Connection to Hwy 51

County: Clark

Design Year: 2040

Year(s) To Be Modeled: 2018 2040

Roadway Cross-Sections: 32' wide - Two 12' travel lanes and 4' outside shoulders

2040 PROPOSED

Note: DHV = (ADT)(K)
DDHV = (ADT)(K)(D)
K - Percent of ADT occuring in design hour
D - Directional Distribution

Operating Speed: 40 **Kfactor** 11% **D** 50%

Traffic Data:

YEAR	ADT	%TRUCK	DHV	CARS	MT	HT	CARS/2	MT/2	HT/2
					30%	70%			
2018	0	0%	0	0	0	0	0	0	0
2040	200	4%	20	19	0	1	20	1	1

Alternative H: Connection to Hwy 51 west of new interchange

Year	ADT	DHV	Truck %	MT30%	HT70%
2018	120	10	4	0.1	0.3
2040	200	20	4	0.2	0.6

Garver
Ryan Mountain

11-Jun-20
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUN
PROJECT/CONT Arkadelphia Bypass Screening
RUN: Alt H Conn to Hwy 51
BARRIER DESIG INPUT HEIGHTS
ATMOSPHERICS 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n	Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB			dBA	dB	dB	dB
17	1	1	0	57.2	66	57.2	10	----		57.2	0	8	-8
20	2	1	0	56.7	66	56.7	10	----		56.7	0	8	-8
25	3	1	0	55.6	66	55.6	10	----		55.6	0	8	-8
30	4	1	0	54.7	66	54.7	10	----		54.7	0	8	-8
35	5	1	0	54.0	66	54	10	----		54	0	8	-8
40	6	1	0	53.3	66	53.3	10	----		53.3	0	8	-8
45	7	1	0	52.7	66	52.7	10	----		52.7	0	8	-8
50	8	1	0	52.2	66	52.2	10	----		52.2	0	8	-8
60	11	1	0	51.3	66	51.3	10	----		51.3	0	8	-8
70	12	1	0	50.6	66	50.6	10	----		50.6	0	8	-8
80	13	1	0	49.9	66	49.9	10	----		49.9	0	8	-8
90	14	1	0	49.3	66	49.3	10	----		49.3	0	8	-8
100	15	1	0	48.8	66	48.8	10	----		48.8	0	8	-8
110	16	1	0	48.3	66	48.3	10	----		48.3	0	8	-8
150	18	1	0	45.8	66	45.8	10	----		45.8	0	8	-8
200	19	1	0	42.6	66	42.6	10	----		42.6	0	8	-8
250	20	1	0	40.2	66	40.2	10	----		40.2	0	8	-8
300	21	1	0	38.2	66	38.2	10	----		38.2	0	8	-8
350	23	1	0	36.6	66	36.6	10	----		36.6	0	8	-8

Dwelling Units	# DUs	Noise Reduction Min dB	Avg dB	Max dB
All Selected	19	0	0	0
All Impacted	0	0	0	0
All that meet NR Goal	0	0	0	0

NOISE DATA WORKSHEET

Job No: 07442

Job Name: Hwy. 67 - Hwy. 51 (Arkadelphia Bypass) P.E.

Roadway Reference: Alt H - Red Hill-Existing

County: Clark

Design Year: 2040

Year(s) To Be Modeled: 2018 2040

Roadway Cross-Sections: 20' wide - Two 10' travel lanes and no outside shoulders

2018 EXISTING

Note: DHV = (ADT)(K)
DDHV = (ADT)(K)(D)
K - Percent of ADT occuring in design hour
D - Directional Distribution

Operating Speed: 35

Kfactor	11%	D	50%

Traffic Data:

YEAR	ADT	%TRUCK	DHV	CARS	MT	HT	CARS/2	MT/2	HT/2
					30%	70%			
2018	280	1%	25	25	0	0	25	1	1
2040	330	1%	30	30	0	0	30	1	1

Alternative H: At Red Hill Road south of Pine

Year	ADT	DHV	Truck %	MT30%	HT70%
2018	280	25	1	0.1	0.2
2040	330	30	1	0.1	0.2

Garver
Ryan Mountain

9-Jun-20
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOU
PROJECT/CON Arkadelphia Bypass Screening
RUN: Alt H-Red Hill Existing
BARRIER DESIC INPUT HEIGHTS
ATMOSPHERIC 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n	Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB			dBA	dB	dB	dB
11	1	1	0	56.7	66	56.7	10	---		56.7	0	8	-8
15	2	1	0	55.3	66	55.3	10	---		55.3	0	8	-8
25	3	1	0	53.4	66	53.4	10	---		53.4	0	8	-8
50	4	1	0	50.1	66	50.1	10	---		50.1	0	8	-8
75	5	1	0	48.1	66	48.1	10	---		48.1	0	8	-8
125	6	1	0	43.5	66	43.5	10	---		43.5	0	8	-8
175	7	1	0	40.3	66	40.3	10	---		40.3	0	8	-8
250	8	1	0	37.1	66	37.1	10	---		37.1	0	8	-8
350	11	1	0	34.2	66	34.2	10	---		34.2	0	8	-8
400	12	1	0	33.1	66	33.1	10	---		33.1	0	8	-8
425	13	1	0	32.6	66	32.6	10	---		32.6	0	8	-8
450	14	1	0	32.1	66	32.1	10	---		32.1	0	8	-8
475	15	1	0	31.7	66	31.7	10	---		31.7	0	8	-8
500	16	1	0	31.3	66	31.3	10	---		31.3	0	8	-8
525	18	1	0	30.8	66	30.8	10	---		30.8	0	8	-8
550	19	1	0	30.4	66	30.4	10	---		30.4	0	8	-8
575	20	1	0	30.1	66	30.1	10	---		30.1	0	8	-8
600	21	1	0	29.7	66	29.7	10	---		29.7	0	8	-8
625	23	1	0	29.3	66	29.3	10	---		29.3	0	8	-8

Dwelling Units	# DUs	Noise Reduction Min dB	Avg dB	Max dB
All Selected	19	0	0	0
All Impacted	0	0	0	0
All that meet NR Goal	0	0	0	0

NOISE DATA WORKSHEET

Job No: 07442

Job Name: Hwy. 67 - Hwy. 51 (Arkadelphia Bypass) P.E.

Roadway Reference: Alt H - Red Hill Proposed

County: Clark

Design Year: 2040

Year(s) To Be Modeled: 2018 2040

Roadway Cross-Sections: 20' wide - Two 10' travel lanes and no outside shoulders

Note: DHV = (ADT)(K)
DDHV = (ADT)(K)(D)
K - Percent of ADT occuring in design hour
D - Directional Distribution

2040	PROPOSED	

Operating Speed: 35

Kfactor	11%	D	50%

Traffic Data:

YEAR	ADT	%TRUCK	DHV	CARS	MT	HT	CARS/2	MT/2	HT/2
					30%	70%			
2018	280	1%	25	25	0	0	25	1	1
2040	330	1%	30	30	0	0	30	1	1

Alternative H: At Red Hill Road south of Pine

Year	ADT	DHV	Truck %	MT30%	HT70%
2018	280	25	1	0.1	0.2
2040	330	30	1	0.1	0.2

Garver
Ryan Mountair

9-Jun-20
TNM 2.5
Calculated with TNM 2.5

RESULTS: SC
PROJECT/CO Arkadelphia Bypass Screening
RUN: Alt H-Red Hill Proposed
BARRIER DES INPUT HEIGHTS

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

ATMOSPHER 68 deg F, 50% RH

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h	Calculated Crit'n	Increase over existing Calculated	Crit'n	Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB		dB		dBA	dB	dB	dB
11	1	1	0	57.1	66	57.1	10		----	57.1	0	8	-8
15	2	1	0	55.7	66	55.7	10		----	55.7	0	8	-8
25	3	1	0	53.8	66	53.8	10		----	53.8	0	8	-8
50	4	1	0	50.5	66	50.5	10		----	50.5	0	8	-8
75	5	1	0	48.5	66	48.5	10		----	48.5	0	8	-8
125	6	1	0	43.9	66	43.9	10		----	43.9	0	8	-8
175	7	1	0	40.7	66	40.7	10		----	40.7	0	8	-8
250	8	1	0	37.4	66	37.4	10		----	37.4	0	8	-8
350	11	1	0	34.5	66	34.5	10		----	34.5	0	8	-8
400	12	1	0	33.4	66	33.4	10		----	33.4	0	8	-8
425	13	1	0	32.9	66	32.9	10		----	32.9	0	8	-8
450	14	1	0	32.4	66	32.4	10		----	32.4	0	8	-8
475	15	1	0	31.9	66	31.9	10		----	31.9	0	8	-8
500	16	1	0	31.5	66	31.5	10		----	31.5	0	8	-8
525	18	1	0	31.1	66	31.1	10		----	31.1	0	8	-8
550	19	1	0	30.7	66	30.7	10		----	30.7	0	8	-8
575	20	1	0	30.3	66	30.3	10		----	30.3	0	8	-8
600	21	1	0	29.9	66	29.9	10		----	29.9	0	8	-8
625	23	1	0	29.6	66	29.6	10		----	29.6	0	8	-8

Dwelling Units	# DUs	Noise Reduction Min dB	Avg dB	Max dB
All Selected	19	0	0	0
All Impacted	0	0	0	0
All that meet NR Goal	0	0	0	0

NOISE DATA WORKSHEET

Job No: 07442

Job Name: Hwy. 67 - Hwy. 51 (Arkadelphia Bypass) P.E.

Roadway Reference: Alt H - Alt H S. of Pine

County: Clark

Design Year: 2040

Year(s) To Be Modeled: 2018 | 2040

Roadway Cross-Sections: 32' wide - Two 12' travel lanes and 4' outside shoulders

2040 | PROPOSED

Note: DHV = (ADT)(K)
DDHV = (ADT)(K)(D)
K - Percent of ADT occuring in design hour
D - Directional Distribution

Operating Speed: 40

Kfactor	11%	D	50%

Traffic Data:

YEAR	ADT	%TRUCK	DHV	CARS	MT	HT	CARS/2	MT/2	HT/2
					30%	70%			
2018	0	0%	0	0	0	0	0	0	0
2040	330	1%	30	30	0	0	30	1	1

Alternative H: At Red Hill Road south of Pine

Year	ADT	DHV	Truck %	MT30%	HT70%
2018	280	25	1	0.1	0.2
2040	330	30	1	0.1	0.2

Garver
Ryan Mountair
9-Jun-20
TNM 2.5
Calculated with TNM 2.5

RESULTS: SC
PROJECT/CO Arkadelphia Bypass Screening
RUN: Alt H-S of Pine
BARRIER DES INPUT HEIGHTS
ATMOSPHER 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h	Calculated Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
17	1	1	0	56.9	66	56.9	10	----	56.9	0	8	-8
22	2	1	0	56.0	66	56	10	----	56	0	8	-8
25	3	1	0	55.3	66	55.3	10	----	55.3	0	8	-8
30	4	1	0	54.4	66	54.4	10	----	54.4	0	8	-8
50	5	1	0	51.9	66	51.9	10	----	51.9	0	8	-8
125	6	1	0	47.4	66	47.4	10	----	47.4	0	8	-8
175	7	1	0	43.8	66	43.8	10	----	43.8	0	8	-8
250	8	1	0	39.9	66	39.9	10	----	39.9	0	8	-8
350	11	1	0	36.4	66	36.4	10	----	36.4	0	8	-8
400	12	1	0	35.1	66	35.1	10	----	35.1	0	8	-8
425	13	1	0	34.5	66	34.5	10	----	34.5	0	8	-8
450	14	1	0	33.9	66	33.9	10	----	33.9	0	8	-8
475	15	1	0	33.4	66	33.4	10	----	33.4	0	8	-8
500	16	1	0	32.9	66	32.9	10	----	32.9	0	8	-8
525	18	1	0	32.5	66	32.5	10	----	32.5	0	8	-8
550	19	1	0	32	66	32	10	----	32	0	8	-8
575	20	1	0	31.6	66	31.6	10	----	31.6	0	8	-8
600	21	1	0	31.1	66	31.1	10	----	31.1	0	8	-8
625	23	1	0	30.7	66	30.7	10	----	30.7	0	8	-8

Dwelling Units	# DUs	Noise Reduction Min dB	Avg dB	Max dB
All Selected	19	0	0	0
All Impacted	0	0	0	0
All that meet NR Goal	0	0	0	0

NOISE DATA WORKSHEET

Job No: 07442

Job Name: Hwy. 67 - Hwy. 51 (Arkadelphia Bypass) P.E.

Roadway Reference: Alt A,B,H - Proposed Alignment Portion

County: Clark

Design Year: 2040

Year(s) To Be Modeled: 2018 2040

Roadway Cross-Sections: 32' wide - Two 12' travel lanes and 4' outside shoulders

2040 PROPOSED

Note: DHV = (ADT)(K)
DDHV = (ADT)(K)(D)
K - Percent of ADT occuring in design hour
D - Directional Distribution

Operating Speed: 55

Kfactor	11%	D	50%

Traffic Data:

YEAR	ADT	%TRUCK	DHV	CARS	MT	HT	CARS/2	MT/2	HT/2
					30%	70%			
				0	0	0	0	0	0
2040	1,600	3%	180	175	2	4	175	2	4

For the western portion between Walnut Street and 13th Street

Year	ADT	DHV	Truck %	MT30%	HT70%
2018	1,400	150	3	1.4	3.1
2040	1,600	180	3	1.6	3.8

Garver 11-Jun-20
Ryan Mountair TNM 2.5
Calculated with TNM 2.5

RESULTS: SC
PROJECT/CO Arkadelphia Bypass Screening
RUN: Alt A, B, H - Proposed
BARRIER DES INPUT HEIGHTS
ATMOSPHER 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h	Calculated Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
20	1	1	0	67.2	66	67.2	10	Snd Lvl	67.2	0	8	-8
25	2	1	0	66.2	66	66.2	10	Snd Lvl	66.2	0	8	-8
30	3	1	0	65.3	66	65.3	10	---	65.3	0	8	-8
35	4	1	0	64.6	66	64.6	10	---	64.6	0	8	-8
40	5	1	0	63.9	66	63.9	10	---	63.9	0	8	-8
50	6	1	0	62.9	66	62.9	10	---	62.9	0	8	-8
60	7	1	0	62.0	66	62	10	---	62	0	8	-8
80	8	1	0	60.6	66	60.6	10	---	60.6	0	8	-8
100	11	1	0	59.4	66	59.4	10	---	59.4	0	8	-8
150	12	1	0	56.3	66	56.3	10	---	56.3	0	8	-8
165	13	1	0	55.2	66	55.2	10	---	55.2	0	8	-8
175	14	1	0	54.5	66	54.5	10	---	54.5	0	8	-8
200	15	1	0	52.9	66	52.9	10	---	52.9	0	8	-8
225	16	1	0	51.5	66	51.5	10	---	51.5	0	8	-8
300	18	1	0	48.1	66	48.1	10	---	48.1	0	8	-8
350	19	1	0	46.4	66	46.4	10	---	46.4	0	8	-8
400	20	1	0	44.9	66	44.9	10	---	44.9	0	8	-8
450	21	1	0	43.6	66	43.6	10	---	43.6	0	8	-8
500	22	1	0	42.4	66	42.4	10	---	42.4	0	8	-8
550	23	1	0	41.4	66	41.4	10	---	41.4	0	8	-8
600	24	1	0	40.4	66	40.4	10	---	40.4	0	8	-8

Dwelling Units	# DUs	Noise Reduction Min dB	Avg dB	Max dB
All Selected	21	0	0	0
All Impacted	2	0	0	0
All that meet NR Goal	0	0	0	0

NOISE DATA WORKSHEET

Job No: 07442

Job Name: Hwy. 67 - Hwy. 51 (Arkadelphia Bypass) P.E.

Roadway Reference: No-Build_Existing_1st St. to 26th St.

County: Clark

Design Year: 2040

Year(s) To Be Modeled: 2018 2040

Roadway Cross-Sections: 40' wide - Two 12' travel lanes and 8' outside shoulders

2018 EXISTING

Note: DHV = (ADT)(K)
DDHV = (ADT)(K)(D)
K - Percent of ADT occuring in design hour
D - Directional Distribution

Operating Speed: 45

Kfactor	11%	D	50%

Traffic Data:

YEAR	ADT	%TRUCK	DHV	CARS	MT	HT	CARS/2	MT/2	HT/2
					30%	70%			
2018	18,200	3%	2000	1940	18	42	1940	18	42
2040	21,700	3%	2400	2328	22	50	2328	22	51

No-build scenario on Pine east of I-30 interchange

Year	ADT	DHV	Truck %	MT30%	HT70%
2018	18,200	2,000	3	18.0	42.0
2040	21,700	2,400	3	21.6	50.4

Garver
Ryan Mountai
11-Jun-20
TNM 2.5
Calculated with TNM 2.5

RESULTS: SC
PROJECT/CO Arkadelphia Bypass Screening
RUN: No-Build-Existing_1st St.-26th St.
BARRIER DE INPUT HEIGHTS
ATMOSPHER 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h	Calculated Crit'n	Increase over existing Calculated	Crit'n	Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB			dBA	dB	dB	dB
22	1	1	0	70.1	66	70.1	10		Snd Lvl	70.1	0	8	-8
25	2	1	0	69.5	66	69.5	10		Snd Lvl	69.5	0	8	-8
30	3	1	0	68.6	66	68.6	10		Snd Lvl	68.6	0	8	-8
35	4	1	0	67.9	66	67.9	10		Snd Lvl	67.9	0	8	-8
50	5	1	0	66.1	66	66.1	10		Snd Lvl	66.1	0	8	-8
75	6	1	0	64.2	66	64.2	10		----	64.2	0	8	-8
100	7	1	0	62.7	66	62.7	10		----	62.7	0	8	-8
120	8	1	0	61.5	66	61.5	10		----	61.5	0	8	-8
155	11	1	0	58.8	66	58.8	10		----	58.8	0	8	-8
175	12	1	0	57.5	66	57.5	10		----	57.5	0	8	-8
200	13	1	0	56.2	66	56.2	10		----	56.2	0	8	-8
250	14	1	0	54.0	66	54.0	10		----	54	0	8	-8
300	15	1	0	52.3	66	52.3	10		----	52.3	0	8	-8
350	16	1	0	50.9	66	50.9	10		----	50.9	0	8	-8
400	18	1	0	49.7	66	49.7	10		----	49.7	0	8	-8
450	19	1	0	48.7	66	48.7	10		----	48.7	0	8	-8
500	20	1	0	47.8	66	47.8	10		----	47.8	0	8	-8

Dwelling Units	# DUs	Noise Reduction Min dB	Avg dB	Max dB
All Selected	17	0	0	0
All Impacted	5	0	0	0
All that meet NR Goal	0	0	0	0

NOISE DATA WORKSHEET

Job No: 07442

Job Name: Hwy. 67 - Hwy. 51 (Arkadelphia Bypass) P.E.

Roadway Reference: No-Build_Existing_26th St. to I-30

County: Clark

Design Year: 2040

Year(s) To Be Modeled: 2018 2040

Roadway Cross-Sections: 70' wide - Four 12' travel lanes, 12' right turn, and 5' sidewalks

2018 EXISTING

Note: DHV = (ADT)(K)
DDHV = (ADT)(K)(D)
K - Percent of ADT occuring in design hour
D - Directional Distribution

Operating Speed: 45 **Kfactor** 11% **D** 50%

Traffic Data:

YEAR	ADT	%TRUCK	DHV	CARS	MT	HT	CARS/2	MT/2	HT/2
					30%	70%			
2018	18,200	3%	2000	1940	18	42	1940	18	42
2040	21,700	3%	2400	2328	22	50	2328	22	51

No-build scenario on Pine east of I-30 interchange

Year	ADT	DHV	Truck %	MT30%	HT70%
2018	18,200	2,000	3	18.0	42.0
2040	21,700	2,400	3	21.6	50.4

Garver
Ryan Mountain

12-Jun-20
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUN
PROJECT/CONTI Arkadelphia Bypass Screening
RUN: No-Build-Existing_26th St.-I-30
BARRIER DESIGI INPUT HEIGHTS
ATMOSPHERICS 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h	Calculated Crit'n	Increase over existing Calculated	Crit'n	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
							Sub'l Inc					
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
37	1	1	0	71.0	66	71	10	Snd Lvl	71	0	8	-8
40	2	1	0	70.6	66	70.6	10	Snd Lvl	70.6	0	8	-8
50	3	1	0	69.4	66	69.4	10	Snd Lvl	69.4	0	8	-8
60	4	1	0	68.4	66	68.4	10	Snd Lvl	68.4	0	8	-8
75	5	1	0	67.3	66	67.3	10	Snd Lvl	67.3	0	8	-8
100	6	1	0	65.8	66	65.8	10	----	65.8	0	8	-8
125	7	1	0	64.6	66	64.6	10	----	64.6	0	8	-8
165	8	1	0	63.1	66	63.1	10	----	63.1	0	8	-8
200	11	1	0	62.0	66	62	10	----	62	0	8	-8
250	12	1	0	60.7	66	60.7	10	----	60.7	0	8	-8
300	13	1	0	59.2	66	59.2	10	----	59.2	0	8	-8
350	14	1	0	57.2	66	57.2	10	----	57.2	0	8	-8
400	15	1	0	55.5	66	55.5	10	----	55.5	0	8	-8
450	16	1	0	54.0	66	54	10	----	54	0	8	-8
500	18	1	0	52.7	66	52.7	10	----	52.7	0	8	-8
550	19	1	0	51.5	66	51.5	10	----	51.5	0	8	-8
600	20	1	0	50.4	66	50.4	10	----	50.4	0	8	-8

Dwelling Units	# DUs	Noise Reduction Min dB	Avg dB	Max dB
All Selected	17	0	0	0
All Impacted	5	0	0	0
All that meet NR Goal	0	0	0	0

NOISE DATA WORKSHEET

Job No: 07442

Job Name: Hwy. 67 - Hwy. 51 (Arkadelphia Bypass) P.E.

Roadway Reference: No-Build_Existing_East of 1st St.

County: Clark

Design Year: 2040

Year(s) To Be Modeled: 2018 | 2040

Roadway Cross-Sections: 40' wide - Two 12' travel lanes and 8' outside shoulders

2018 EXISTING

Note: DHV = (ADT)(K)
DDHV = (ADT)(K)(D)
K - Percent of ADT occuring in design hour
D - Directional Distribution

Operating Speed: 45

Kfactor	11%	D	50%

Traffic Data:

YEAR	ADT	%TRUCK	DHV	CARS	MT	HT	CARS/2	MT/2	HT/2
					30%	70%			
2018	18,200	3%	2000	1940	18	42	1940	18	42
2040	21,700	3%	2400	2328	22	50	2328	22	51

No-build scenario on Pine east of I-30 interchange

Year	ADT	DHV	Truck %	MT30%	HT70%
2018	18,200	2,000	3	18.0	42.0
2040	21,700	2,400	3	21.6	50.4

Garver
Ryan Mountair

11-Jun-20
TNM 2.5
Calculated with TNM 2.5

RESULTS: SC
PROJECT/CO Arkadelphia Bypass Screening
RUN: No-Build-Existing_E of 1st St.
BARRIER DES INPUT HEIGHTS

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

ATMOSPHER 68 deg F, 50% RH

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h	Calculated Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
22	1	1	0	74.5	66	74.5	10	Snd Lvl	74.5	0	8	-8
25	2	1	0	73.9	66	73.9	10	Snd Lvl	73.9	0	8	-8
30	3	1	0	73.1	66	73.1	10	Snd Lvl	73.1	0	8	-8
35	4	1	0	72.3	66	72.3	10	Snd Lvl	72.3	0	8	-8
50	5	1	0	70.6	66	70.6	10	Snd Lvl	70.6	0	8	-8
75	6	1	0	68.7	66	68.7	10	Snd Lvl	68.7	0	8	-8
100	7	1	0	67.2	66	67.2	10	Snd Lvl	67.2	0	8	-8
120	8	1	0	65.9	66	65.9	10	----	65.9	0	8	-8
155	11	1	0	63.0	66	63	10	----	63	0	8	-8
175	12	1	0	61.6	66	61.6	10	----	61.6	0	8	-8
200	13	1	0	60.2	66	60.2	10	----	60.2	0	8	-8
250	14	1	0	57.7	66	57.7	10	----	57.7	0	8	-8
300	15	1	0	55.7	66	55.7	10	----	55.7	0	8	-8
350	16	1	0	54.1	66	54.1	10	----	54.1	0	8	-8
400	18	1	0	52.7	66	52.7	10	----	52.7	0	8	-8
450	19	1	0	51.6	66	51.6	10	----	51.6	0	8	-8
500	20	1	0	50.5	66	50.5	10	----	50.5	0	8	-8

Dwelling Units	# DUs	Noise Reduction Min dB	Avg dB	Max dB
All Selected	17	0	0	0
All Impacted	7	0	0	0
All that meet NR Goal	0	0	0	0

NOISE DATA WORKSHEET

Job No: 07442

Job Name: Hwy. 67 - Hwy. 51 (Arkadelphia Bypass) P.E.

Roadway Reference: No-Build_Prop_1st St.-26th St.

County: Clark

Design Year: 2040

Year(s) To Be Modeled: 2018 2040

Roadway Cross-Sections: 40' wide - Two 12' travel lanes and 8' outside shoulders

2040 PROPOSED

Note: DHV = (ADT)(K)
DDHV = (ADT)(K)(D)
K - Percent of ADT occuring in design hour
D - Directional Distribution

Operating Speed: 45 **Kfactor** 11% **D** 50%

Traffic Data:

YEAR	ADT	%TRUCK	DHV	CARS	MT	HT	CARS/2	MT/2	HT/2
					30%	70%			
2018	18,200	3%	2000	1940	18	42	1940	18	42
2040	21,700	3%	2400	2328	22	50	2328	22	51

No-build scenario on Pine east of I-30 interchange

Year	ADT	DHV	Truck %	MT30%	HT70%
2018	18,200	2,000	3	18.0	42.0
2040	21,700	2,400	3	21.6	50.4

Garver
Ryan Mountain

12-Jun-20
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOU
PROJECT/CON: Arkadelphia Bypass Screening
RUN: No-Build-Prop_1st St.-26th St.
BARRIER DESI(INPUT HEIGHTS
ATMOSPHERIC 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h	Calculated Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
22	1	1	0	70.9	66	70.9	10	Snd Lvl	70.9	0	8	-8
25	2	1	0	70.3	66	70.3	10	Snd Lvl	70.3	0	8	-8
30	3	1	0	69.4	66	69.4	10	Snd Lvl	69.4	0	8	-8
35	4	1	0	68.7	66	68.7	10	Snd Lvl	68.7	0	8	-8
65	5	1	0	65.7	66	65.7	10	----	65.7	0	8	-8
75	6	1	0	65.0	66	65	10	----	65	0	8	-8
110	7	1	0	63.1	66	63.1	10	----	63.1	0	8	-8
120	8	1	0	62.3	66	62.3	10	----	62.3	0	8	-8
155	11	1	0	59.6	66	59.6	10	----	59.6	0	8	-8
175	12	1	0	58.4	66	58.4	10	----	58.4	0	8	-8
200	13	1	0	57.0	66	57	10	----	57	0	8	-8
250	14	1	0	54.8	66	54.8	10	----	54.8	0	8	-8
300	15	1	0	53.1	66	53.1	10	----	53.1	0	8	-8
350	16	1	0	51.7	66	51.7	10	----	51.7	0	8	-8
400	18	1	0	50.5	66	50.5	10	----	50.5	0	8	-8
450	19	1	0	49.5	66	49.5	10	----	49.5	0	8	-8
500	20	1	0	48.6	66	48.6	10	----	48.6	0	8	-8

Dwelling Units	# DUs	Noise Reduction Min dB	Avg dB	Max dB
All Selected	17	0	0	0
All Impacted	4	0	0	0
All that meet NR Goal	0	0	0	0

NOISE DATA WORKSHEET

Job No: 07442

Job Name: Hwy. 67 - Hwy. 51 (Arkadelphia Bypass) P.E.

Roadway Reference: No-Build_Prop_26th St. to I-30

County: Clark

Design Year: 2040

Year(s) To Be Modeled: 2018 2040

Roadway Cross-Sections: 70' wide - Four 12' travel lanes, 12' right turn, and 5' sidewalks

2040 PROPOSED

Note: DHV = (ADT)(K)
DDHV = (ADT)(K)(D)
K - Percent of ADT occuring in design hour
D - Directional Distribution

Operating Speed: 40

Kfactor	11%	D	50%

Traffic Data:

YEAR	ADT	%TRUCK	DHV	CARS	MT	HT	CARS/2	MT/2	HT/2
					30%	70%			
2018	18,200	3%	2000	1940	18	42	1940	18	42
2040	21,700	3%	2400	2328	22	50	2328	22	51

No-build scenario on Pine east of I-30 interchange

Year	ADT	DHV	Truck %	MT30%	HT70%
2018	18,200	2,000	3	18.0	42.0
2040	21,700	2,400	3	21.6	50.4

Garver
Ryan Mountai

12-Jun-20
TNM 2.5
Calculated with TNM 2.5

RESULTS: SC
PROJECT/CO Arkadelphia Bypass Screening
RUN: No-Build-Prop_26th St.-I-30
BARRIER DE INPUT HEIGHTS

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

ATMOSPHER 68 deg F, 50% RH

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h	Calculated	Crit'n	Increase over existing Calculated	Crit'n	Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB				dBA	dB	dB	dB
37	1	1	0	71.8	66	71.8	10	Snd Lvl		71.8	0	8	-8
40	2	1	0	71.4	66	71.4	10	Snd Lvl		71.4	0	8	-8
50	3	1	0	70.2	66	70.2	10	Snd Lvl		70.2	0	8	-8
60	4	1	0	69.2	66	69.2	10	Snd Lvl		69.2	0	8	-8
70	5	1	0	68.4	66	68.4	10	Snd Lvl		68.4	0	8	-8
80	6	1	0	67.7	66	67.7	10	Snd Lvl		67.7	0	8	-8
90	7	1	0	67.2	66	67.2	10	Snd Lvl		67.2	0	8	-8
110	8	1	0	66.1	66	66.1	10	Snd Lvl		66.1	0	8	-8
125	11	1	0	65.4	66	65.4	10	----		65.4	0	8	-8
150	12	1	0	64.4	66	64.4	10	----		64.4	0	8	-8
190	13	1	0	63.1	66	63.1	10	----		63.1	0	8	-8
250	14	1	0	61.5	66	61.5	10	----		61.5	0	8	-8
300	15	1	0	60.0	66	60	10	----		60	0	8	-8
350	16	1	0	58.0	66	58	10	----		58	0	8	-8
400	18	1	0	56.3	66	56.3	10	----		56.3	0	8	-8
450	19	1	0	54.8	66	54.8	10	----		54.8	0	8	-8
500	20	1	0	53.5	66	53.5	10	----		53.5	0	8	-8

Dwelling Units	# DUs	Noise Reduction Min dB	Avg dB	Max dB
All Selected	17	0	0	0
All Impacted	8	0	0	0
All that meet NR Goal	0	0	0	0

NOISE DATA WORKSHEET

Job No: 07442

Job Name: Hwy. 67 - Hwy. 51 (Arkadelphia Bypass) P.E.

Roadway Reference: No-Build_Prop_East of 1st St.

County: Clark

Design Year: 2040

Year(s) To Be Modeled: 2018 2040

Roadway Cross-Sections: 40' wide - Two 12' travel lanes and 8' outside shoulders

2040 PROPOSED

Note: DHV = (ADT)(K)
DDHV = (ADT)(K)(D)
K - Percent of ADT occuring in design hour
D - Directional Distribution

Operating Speed: 45

Kfactor	11%	D	50%

Traffic Data:

YEAR	ADT	%TRUCK	DHV	CARS	MT	HT	CARS/2	MT/2	HT/2
					30%	70%			
2018	18,200	3%	2000	1940	18	42	1940	18	42
2040	21,700	3%	2400	2328	22	50	2328	22	51

No-build scenario on Pine east of I-30 interchange

Year	ADT	DHV	Truck %	MT30%	HT70%
2018	18,200	2,000	3	18.0	42.0
2040	21,700	2,400	3	21.6	50.4

Garver
Ryan Mountair

12-Jun-20
TNM 2.5
Calculated with TNM 2.5

RESULTS: SC
PROJECT/CO Arkadelphia Bypass Screening
RUN: No-Build-Prop_E of 1st St.
BARRIER DES INPUT HEIGHTS

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

ATMOSPHER 68 deg F, 50% RH

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h	Calculated Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
22	1	1	0	75.3	66	75.3	10	Snd Lvl	75.3	0	8	-8
25	2	1	0	74.7	66	74.7	10	Snd Lvl	74.7	0	8	-8
30	3	1	0	73.9	66	73.9	10	Snd Lvl	73.9	0	8	-8
35	4	1	0	73.1	66	73.1	10	Snd Lvl	73.1	0	8	-8
50	5	1	0	71.4	66	71.4	10	Snd Lvl	71.4	0	8	-8
75	6	1	0	69.5	66	69.5	10	Snd Lvl	69.5	0	8	-8
100	7	1	0	68.0	66	68	10	Snd Lvl	68	0	8	-8
125	8	1	0	66.3	66	66.3	10	Snd Lvl	66.3	0	8	-8
160	11	1	0	63.5	66	63.5	10	----	63.5	0	8	-8
175	12	1	0	62.4	66	62.4	10	----	62.4	0	8	-8
200	13	1	0	61.0	66	61	10	----	61	0	8	-8
250	14	1	0	58.5	66	58.5	10	----	58.5	0	8	-8
300	15	1	0	56.5	66	56.5	10	----	56.5	0	8	-8
350	16	1	0	54.9	66	54.9	10	----	54.9	0	8	-8
400	18	1	0	53.6	66	53.6	10	----	53.6	0	8	-8
450	19	1	0	52.4	66	52.4	10	----	52.4	0	8	-8
500	20	1	0	51.4	66	51.4	10	----	51.4	0	8	-8

Dwelling Units	# DUs	Noise Reduction Min dB	Avg dB	Max dB
All Selected	17	0	0	0
All Impacted	8	0	0	0
All that meet NR Goal	0	0	0	0

NOISE DATA WORKSHEET

Job No: 07442

Job Name: Hwy. 67 - Hwy. 51 (Arkadelphia Bypass) P.E.

Roadway Reference: Interchange Alts. 1, 1A, 2, 3

County: Clark

Design Year: 2040

Year(s) To Be Modeled: 2018 2040

Roadway Cross-Sections: 32' wide - Two 12' travel lanes and 4' outside shoulders

2040 PROPOSED

Note: DHV = (ADT)(K)
DDHV = (ADT)(K)(D)
K - Percent of ADT occuring in design hour
D - Directional Distribution

Operating Speed: 40 mph **Kfactor** 11% **D** 50%

Traffic Data:

YEAR	ADT	%TRUCK	DHV	CARS	MT	HT	CARS/2	MT/2	HT/2
					30%	70%			
2018	0	0%	0	0	0	0	0	0	0
2040	160	3%	180	175	2	4	175	2	4

For the western portion between Walnut Street and 13th Street

Year	ADT	DHV	Truck %	MT30%	HT70%
2018	1,400	150	3	1.4	3.1
2040	1,600	180	3	1.6	3.8

Garver
Ryan Mountain

19-Jun-20
TNM 2.5
Calculated with TNM 2.5

RESULTS: SC
PROJECT/CO Arkadelphia Bypass Screening
RUN: Interchange Alts. 1, 1A, 2, 3
BARRIER DES INPUT HEIGHTS

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

ATMOSPHER 68 deg F, 50% RH

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h	Calculated Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
17	1	1	0	63.8	66	63.8	10	---	63.8	0	8	-8
20	2	1	0	63.2	66	63.2	10	---	63.2	0	8	-8
25	3	1	0	62.2	66	62.2	10	---	62.2	0	8	-8
30	4	1	0	61.3	66	61.3	10	---	61.3	0	8	-8
35	5	1	0	60.6	66	60.6	10	---	60.6	0	8	-8
40	6	1	0	59.9	66	59.9	10	---	59.9	0	8	-8
45	7	1	0	59.3	66	59.3	10	---	59.3	0	8	-8
50	8	1	0	58.8	66	58.8	10	---	58.8	0	8	-8
60	11	1	0	57.9	66	57.9	10	---	57.9	0	8	-8
70	12	1	0	57.2	66	57.2	10	---	57.2	0	8	-8
80	13	1	0	56.5	66	56.5	10	---	56.5	0	8	-8
90	14	1	0	56.0	66	56.0	10	---	56	0	8	-8
100	15	1	0	55.4	66	55.4	10	---	55.4	0	8	-8
110	16	1	0	54.9	66	54.9	10	---	54.9	0	8	-8
150	18	1	0	52.4	66	52.4	10	---	52.4	0	8	-8
200	19	1	0	49.1	66	49.1	10	---	49.1	0	8	-8
250	20	1	0	46.6	66	46.6	10	---	46.6	0	8	-8
300	21	1	0	44.7	66	44.7	10	---	44.7	0	8	-8
350	23	1	0	43.1	66	43.1	10	---	43.1	0	8	-8

Dwelling Units	# DUs	Noise Reduction Min dB	Avg dB	Max dB
All Selected	19	0	0	0
All Impacted	0	0	0	0
All that meet NR Goal	0	0	0	0

Appendix F – Visual Impact Assessment

Job Number 070442

Visual Impact Assessment Technical Memorandum

Purpose of this Memorandum

The purpose of this Visual Impact Assessment (VIA) Memorandum (memo) is to evaluate potential visual impacts associated with the Hwy. 67 - Hwy. 51 (Arkadelphia Bypass) project. The VIA was prepared using guidance outlined in the *Guidelines for the Visual Impact Assessment of Highway Projects* published by the Federal Highway Administration (FHWA) in January 2015.

Visual Impact Assessment

The VIA Scoping Questionnaire was completed. As shown in Attachment 1, the response to each question has a corresponding value between 1 and 3, resulting in an overall score of 14. Consistent with FHWA guidelines, a score of 10 to 14 recommends the preparation of a brief visual impact assessment in memo format. This memo documents the recommended level of assessment.

Visual resource and VIA definitions for the concepts and terms used in the remainder of this memo are provided in Attachment 2. The visual impacts described are associated with Alternatives A, B, D, F, G, and H and Interchange Alternatives 2 and 3; no impacts are anticipated under the No Action Alternative.

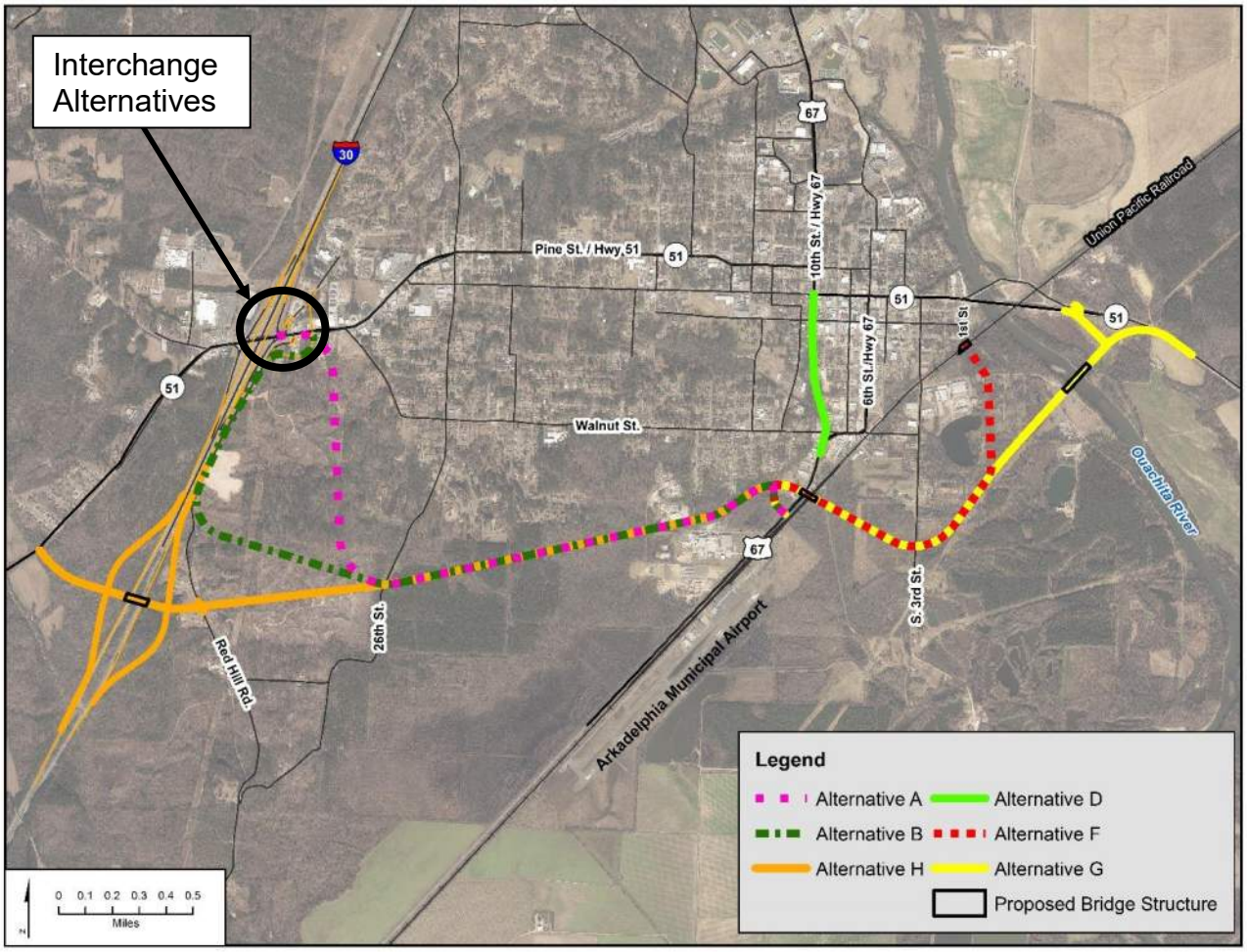
Proposed project viewers are categorized as either neighbors or travelers. Neighbors include residents and business occupants. Travelers include users of the project corridor and adjacent roadways.

Existing Visual Character

The area of visual effect (APE) for the West Bypass Alternatives (Alternatives A, B, and H) extend along the south side of the city from I-30 to Hwy. 67. The AVE for East Bypass Alternatives F and G extend along the south side of the city from Hwy. 51 near the Ouachita River to Hwy. 67, while Alternative D creates a new north-south route for Hwy. 67. All alternatives terminate at Hwy 67 near the Arkadelphia Municipal Airport and would construct a new two-lane bypass that will help reduce traffic within downtown Arkadelphia.

The AVE for Interchange Alternatives 1, 1A, 2, and 3 occur immediately east of the existing I-30/Hwy. 51 interchange. See **Figure 1** below showing the general AVE and each alternative’s location.

Figure 1: Area of Visual Effect (AVE) and each Project Corridor



Alternatives A and B begin near the southeast side of the I-30/Hwy. 51 interchange while Alternative H begins at Hwy. 51 west of I-30. Alternatives A and H are located on all new alignments while Alternative B improves the existing Redhill Drive for 0.6 mile before heading east on new alignment. All West Bypass Alternatives (i.e., A, B, and H) would likely be a two-lane rural road with open shoulders.

Alternative H provides additional connectivity to Hwy. 51 on the west side of I-30, includes a diamond interchange at I-30 (including a proposed overpass at I-30), and then extends east to follow a similar route to Alternatives A and B as it ties into Hwy. 67. Due to the close spacing between the proposed Alternative H interchange and the existing interchange, collector-distributor (C-D) lanes (one single lane road on each side of I-30) would be incorporated between the interchanges to eliminate weaving on the main lanes of I-30. These C-D lanes would be utilized in order to access both the existing and proposed interchanges. Alternative H also requires street improvements immediately east of the existing I-

30/Hwy. 51 interchange in order to provide adequate separation between the on/off ramps and local street intersections.

Alternative D's corridor begins near the intersection of Hwy. 67 and Caddo St. and extends south on primarily new alignment for approximately 0.6 miles then connects back to Hwy. 67 just north of the Airport. Alternative D would improve the existing roadway geometry at the intersection of Caddo St. and 10th St. then extend south approximately 0.6 mile on new alignment and tie back into Hwy. 67 just south of Walnut Street. Alternative D would consist of two travel lanes with a concrete combination curb and gutter.

Alternative F begins near the intersection of 1st St. and Hwy. 51 west of the existing Ouachita River bridge. This alternative would improve a portion of 1st St., construct a bridge over the Union Pacific Railroad (UPRR), continue south on new alignment, and construct another bridge over both Hwy. 67 and the UPRR before tying into Hwy. 67. Retaining walls are proposed to avoid direct impacts to the apartment complex located on the west side of 1st St. and to minimize impacts to the Ouachita River Park located on the east side of 1st Street.

Alternative G begins at Hwy. 51 east of the existing Ouachita River bridge. This alternative is entirely on new alignment and would require construction of a new bridge across the Ouachita River. The southern-most portion of Alternative G follows the same alignment as Alternative F and would also construct a bridge over both Hwy. 67 and the UPRR before tying into Hwy. 67.

Interchange Alternative 1 would require modifications to the existing diamond interchange to allow for better intersection spacing. Two new buttonhook ramps would be constructed that tie into Professional Park Dr. The new exit ramp would allow for a left or right turn onto Professional Park Dr. The right turn movement would also serve as access to Hwy. 51 westbound. The existing eastbound I-30 exit would be retained and modified where left turning movements would no longer be permitted so that only access to eastbound Hwy. 51 would be provided. The new eastbound I-30 entrance ramp connection would tie into Professional Park Dr. and connect to the existing I-30 eastbound entrance ramp, requiring removal of approximately 700 feet of the existing ramp. To the east of the Red Hill Dr. realignment, the new primary through movement will be the new bypass alignment instead of Hwy. 51. The existing Hwy. 51 alignment to the east of the interchange will be modified to tie into the new bypass alignment with a signalized intersection or roundabout.

Alternative 1A would require the same modifications as Alternative 1 with the exception that it would not construct the eastern-most intersection improvement that ties into Hwy. 51.

Interchange Alternative 2 would require modifications to the existing diamond interchange. Two new buttonhook ramps would be constructed; one that ties into Professional Park Dr. north of Hwy. 51, and another that ties into the new bypass

alignment to the south, which also serves as access to Red Hill Road. Approximately 700 feet of the existing exit ramp will be removed to the north of the new ramp connection. The new eastbound I-30 entrance ramp connection would tie into Professional Park Dr. and connect to the existing I-30 eastbound entrance ramp. The existing Hwy. 51 alignment would largely remain the same as existing conditions.

Interchange Alternative 3 would not require modifications to the existing diamond interchange. With this alternative, the ramps would remain in their existing location, and the intersection of Professional Park Dr. and Red Hill Rd. would be relocated to the east. The existing Hwy. 51 alignment would largely remain the same as existing conditions.

The following summarizes each alternative's corridor and their estimated ROW widths:

- Alternative A (200-foot width) – Deciduous and coniferous woodland over terrain ranging from 180 to 300 feet in elevation. Alternative A passes near residential and commercial areas concentrated near Hwy. 51 and Hwy. 67.
- Alternative B (200-foot width) – Includes 0.6 mile of Redhill Drive, which is immediately east of I-30. Areas directly east of Redhill Drive are currently being developed and construction and land disturbance is believed to be on-going. The remainder of the corridor contains deciduous and coniferous woodland over terrain ranging from 180 to 330 feet in elevation. Alternative B passes near residential and commercial areas concentrated near Hwy. 51 and Hwy. 67.
- Alternative H (100 to 300-foot width) – The bypass and ramp segments consists predominantly of deciduous and coniferous woodland over terrain ranging from 180 to 350 feet in elevation. Alternative H also crosses a portion of Red Hill Dr. containing a small cluster of rural residences. The corridor segments that would contain the C-D lanes include portions of I-30, adjacent woodlands, and urban commercial development near the existing I-30/Hwy. 51 interchange. The corridor segments that would contain the local street improvements immediately east of the existing I-30/Hwy. 51 interchange contain urban commercial development as well as a portion of a mobile home park. Urban areas have minimal landscaping.
- Alternative D (100-foot width) – Mix of commercial structures and single-family homes located near downtown Arkadelphia over terrain ranging from 190 to 240 feet in elevation. Urban areas near Hwy 67 have minimal landscaping with few improvements, while many of the residences near Caddo St. feature trees, grassy lawns, and other landscaping elements.
- Alternative F (100 to 200-foot width) – Includes 0.1 mile of S. 1st St., which is located near downtown Arkadelphia and contains single-family homes, an

apartment complex, a city park, and one commercial/industrial facility. Sidewalks and curbs and gutters are inconsistently present along S. 1st Street. The remainder of the corridor contains predominantly woodland, but also includes some commercial properties and the UPRR crossings. Most commercial areas lack landscaping and are not architecturally uniform in appearance. Terrain within the corridor is flat and ranges from 180 to 210 feet in elevation.

- Alternative G (200-foot width) – Primarily agricultural fields and woodland over terrain ranging from 150 to 210 feet in elevation. Includes the Ouachita River, commercial structures near Hwy. 67, and the UPRR. Alternative G passes near additional residential and commercial areas concentrated near Hwy. 67 and S 3rd Street. Urban areas have minimal landscaping with few improvements near Hwy 67.
- Interchange Alternatives 1, 1A, 2, and 3 (100-foot widths) – Urban commercial development and a portion of a mobile home park over terrain ranging from 290 to 330 feet in elevation. These areas have minimal landscaping with few improvements along Hwy 51.

Overall, the project study areas east of 26th St. are relatively flat while areas west of 26th St. have hilltops and valleys that vary significantly in elevation. Elevations across the entire project range from approximately 180 to 350 feet above mean sea level. Long distance views are fairly uncommon due to a combination of elevation uniformity (primarily to the east), the screening effect of structures (in urban areas), and the screening effect of wooded areas (in new alignment sections). These wooded areas consist of a predominantly dense mix of coniferous, upland deciduous, riparian woodlands, and bottomland hardwood forests. For those corridors with existing roadways, all lack medians, many do not feature curbs and gutters or sidewalks, and several neighboring structures afford partial or complete views of the roadway and are in turn visible to travelers.

Permanent Impacts

All build alternatives would permanently create new infrastructure that would change travelers' visual resources. All build alternatives would also remove existing structures and clear trees and vegetation that would alter the project corridor's current appearance; however, few neighbors are present to discern such changes. Neighboring structures such as businesses would become visible to travelers along portions of the new bypass facility, such as those along I-30 (for Alternative H), Red Hill Rd. (Alternatives B and H), Hwy. 67 (Alternatives D, F, and G), and 1st St. (Alternative F). Undeveloped wooded areas will also become a positive visual resource for travelers utilizing Alternatives A, B, F, G, and H. Overall, visual quality is predicted to be enhanced for the majority of travelers as the alignments route travelers away from urban settings and through more rural ones.

Alternatives F, G, and H would introduce structures that are relatively higher than others in the surrounding area. Alternative F would construct two new bridges over the UPRR and Alternative G would construct a UPRR overpass as well as a new bridge over the Ouachita River. Alternative H would construct an I-30 overpass. The heights of these proposed overpass/bridge structures would increase neighbors' views of them; although few neighbors are present. Additionally, these proposed overpass/bridge structures would expand travelers' views of the surrounding area, which is primarily undeveloped areas. These new elevated structures would represent a moderate change from the project area's existing visual character.

For residents and businesses (referred to as project "neighbors"), all build alternatives would permanently alter their viewshed through the introduction of a new roadway, removal of existing structures, and clearing trees. However, this is not out of character with the existing viewsheds of Alternatives B, D, F, G, and H corridors, as existing highways are already incorporated into the visual character of their locations and are compatible with surrounding land development principles. Nevertheless, impacts may be adverse for residential neighbors for whom views of the roadway would become prominent. For Alternative A, residences at Cox Mobile Manor and business neighbors near Hwy. 51/I-30 will have a direct view of the bypass. For Alternatives A, B, and H, residences at the south ends of S. 13th St. and S. 11th St. will likely have a direct view of the bypass as few trees will be present between the homes and the proposed roadway. In addition to some residential neighbors, Alternative B would have several future business neighbors along Red Hill Dr. as this area is currently being developed. For Alternative H, a few residential neighbors along Red Hill Dr. would also gain a prominent view of the bypass. For Alternative F, and especially for Alternative D, several residences and businesses along the alternative's corridor would be in close proximity to the roadway. However, the proximities of residential and commercial structures would not exceed zoning codes. For Alternative G, residences at the east end of C St. and businesses near Hwy. 67 will likely have a direct view of the bypass as few trees will be present between the homes and the proposed roadway. For business neighbors, impacts may be positive as they may benefit from increased visibility to travelers. This beneficial exposure would be strongest for Alternatives B and D. Within the exception of Alternative D, overall relatively few project neighbors exist as improvements are located away from most development and, therefore, visual impacts to residences and businesses (i.e., neighbors) would be minor. Depending on viewer exposure and sensitivity, these changes could be experienced as either beneficial, neutral, or adverse.

The proposed roadway cross section and materials of all build alternatives are typical of transportation improvements in the Arkadelphia area. Visual resources uncommon in the area would not be introduced. With the exception of Alternative G, which would construct a new bridge over the Ouachita River, geographic

landforms would not be noticeably altered by the alternatives. As applicable, local planning and development guidelines would be taken into consideration during final design to ensure visual compatibility of the Selected Alternative. In addition to improving safety in the Central Business District (accomplished by all alternatives), the concrete combination curb and gutter of Alternative D is noted for improving streetscape appearances. Based on the factors described above, the visual resources of the proposed facilities are predicted to be beneficial to the existing overall visual character of the corridor. Overall visual quality is therefore predicted to be enhanced for the majority of business neighbors and for travelers.

Based on predicted viewer exposure and sensitivity, permanent adverse impacts would be minor and localized for the few residents for whom exposure will be increased. These residents are concentrated primarily along the north end of Alternative D, along S 1st St. (Alternative F), and along Red Hill Dr. (Alternative H).

Temporary Impacts

Project construction would result in the short-term presence of construction vehicles and equipment, grading and excavation, and vegetation clearing throughout the project area. The areas where construction and grading would remove existing natural vegetation would be viewable by adjacent travelers and site-specific neighbors, but only if an existing roadway or neighbor were present. For Alternative D, portions of Alternative H, and the Interchange Alternatives, most of the construction would be viewable by travelers and site-specific neighbors. However, for the remaining alternatives on new alignment, most construction would not be visible. Grading and excavation activities and the presence of construction vehicles and equipment would result in a temporary change in the visual character of the project corridor. The temporary presence of construction vehicles and equipment is not expected to result in a substantially adverse response by typical viewers and will be localized to viewers for whom exposure will be increased.

Avoidance, Minimization and/or Mitigation Measures

The proposed project's visual resources (e.g., cross sections and construction materials) would complement the visual character desired by the community as expressed in the City's development regulations. Impacts to existing landscaping within the project area would be minimized through re-landscaping efforts.

Attachments

1. VIA Scoping Questionnaire
2. VIA Definitions

Visual Impact Assessment Scoping Questionnaire

Project Name: Hwy. 67 - Hwy. 51 (Arkadelphia Bypass) P.E.

Location: Arkadelphia, Clark County, AR

Special Conditions/Notes: Conducted By: C. Schmidt

Environmental Compatibility

1. *Will the project result in a noticeable change in the physical characteristics of the existing environment?* (Consider all project components and construction impacts - both permanent and temporary, including landform changes, structures, noise barriers, vegetation removal, railing, signage, and contractor activities.)

- ☐ High level of permanent change (3)
- ☑ Moderate level of permanent change (2)
- ☐ Low level of permanent or temporary change (1)
- ☐ No Noticeable Change (0)

2. *Will the project complement or contrast with the visual character desired by the community?* (Evaluate the scale and extent of the project features compared to the surrounding scale of the community. Is the project likely to give an urban appearance to an existing rural or suburban community? Do you anticipate that the change will be viewed by the public as positive or negative? Research planning documents, or talk with local planners and community representatives to understand the type of visual environment local residents envision for their community.)

- ☐ Low Compatibility (3)
- ☐ Moderate Compatibility (2)
- ☑ High compatibility (1)

3. *What level of local concern is there for the types of project features (e.g., bridge structures, large excavations, sound barriers, or median planting removal) and construction impacts that are proposed?* (Certain project improvements can be of special interest to local citizens, causing a heightened level of public concern, and requiring a more focused visual analysis.)

- ☐ High concern (3)
- ☐ Moderate concern (2)
- ☑ Low concern (1)
- ☐ Negligible Project Features (0)

4. *Is it anticipated that to mitigate visual impacts, it may be necessary to develop extensive or novel mitigation strategies to avoid, minimize, or compensate for adverse impacts or will using conventional mitigation strategies, such as landscape or architectural treatment adequately mitigate adverse visual impacts?*

☐ Extensive Non-Conventional Mitigation Likely (3)
☐ Some non-conventional Mitigation Likely (2)
☑ Only Conventional Mitigation Likely (1)
☐ No Mitigation Likely (0)

5. Will this project, when seen collectively with other projects, result in an aggregate adverse change (cumulative impacts) in overall visual quality or character? (Identify any projects [both state and local] in the area that have been constructed in recent years and those currently planned for future construction. The window of time and the extent of area applicable to possible cumulative impacts should be based on a reasonable anticipation of the viewing public's perception.)

☐ Cumulative Impacts likely: 0-5 years (3)
☑ Cumulative Impacts likely: 6-10 years (2)
☐ Cumulative Impacts unlikely (1)

Viewer Sensitivity

1. *What is the potential that the project proposal may be controversial within the community, or opposed by any organized group?* (This can be researched initially by talking with the state DOT and local agency management and staff familiar with the affected community's sentiments as evidenced by past projects and/or current information.)

☐ High Potential (3)
☐ Moderate Potential (2)
☑ Low Potential (1)
☐ No Potential (0)

2. *How sensitive are potential viewer-groups likely to be regarding visible changes proposed by the project?* (Consider among other factors the number of viewers within the group, probable viewer expectations, activities, viewing duration, and orientation. The expected viewer sensitivity level may be scoped by applying professional judgment, and by soliciting information from other DOT staff, local agencies and community representatives familiar with the affected community's sentiments and demonstrated concerns.)

☐ High Sensitivity (3)
☐ Moderate Sensitivity (2)
☑ Low Sensitivity (1)

3. *To what degree does the project's aesthetic approach appear to be consistent with applicable laws, ordinances, regulations, policies or standards?*

☐ Low Compatibility (3)
☑ High compatibility (1)
☐ Moderate Compatibility (2)

4. *Are permits going to be required by outside regulatory agencies (i.e., Federal, State, or local)?* (Permit requirements can have an unintended consequence on the visual environment. Anticipated permits, as well as specific permit requirements - which are defined by the permitter, may be determined by talking with the project environmental planner and project engineer. Note: coordinate with the state DOT representative responsible for obtaining the permit prior to communicating directly with any permitting agency. Permits that may benefit from additional analysis include permits that may result in visible built features, such as infiltration basins or devices under a storm water permit or a retaining wall for wetland avoidance or permits for work in sensitive areas such as coastal development permits or on Federal lands, such as impacts to Wild and Scenic Rivers.)

☑ Yes (3)
☐ No (1)
☐ Maybe (2)

5. *Will the project sponsor or public benefit from a more detailed visual analysis in order to help reach consensus on a course of action to address potential visual impacts?* (Consider the proposed project features, possible visual impacts, and probable mitigation recommendations.)

☐ Yes (3)
☑ No (1)
☐ Maybe (2)

Total Project Score: 14

Determining the Level of Visual Impact Assessment

Total the scores of the answers to all ten questions on the Visual Impact Assessment Scoping Questionnaire. Use the total score from the questionnaire as an indicator of the appropriate level of VIA to perform for the project. Confirm that the level suggested by the checklist is consistent with the project teams' professional judgments. If there remains doubt about whether a VIA needs to be completed, it may be prudent to conduct an Abbreviated VIA. If there remains doubt about the level of the VIA, begin with the simpler VIA process. If visual impacts emerge as a more substantial concern than anticipated, the level of VIA documentation can always be increased.

The level of the VIA can initially be based on the following ranges of total scores:

☐ ***Score 25-30***

An *Expanded VIA* is probably necessary. It is recommended that it should be proceeded by a formal visual scoping study prior to beginning the VIA to alert the project team to potential highly adverse impacts and to develop new project alternatives to avoid those impacts. These technical studies will likely receive state-wide, even national, public review. Extensive use of visual simulations and a comprehensive public involvement program would be typical.

☐ ***Score 20-24***

A *Standard VIA* is recommended. This technical study will likely receive extensive local, perhaps state-wide, public review. It would typically include several visual simulations. It would also include a thorough examination of public planning and policy documents supplemented with a direct public engagement processes to determine visual preferences.

☐ ***Score 15-19***

An *Abbreviated VIA* would briefly describe project features, impacts and mitigation requirements. Visual simulations would be optional. An Abbreviated VIA would receive little direct public interest beyond a summary of its findings in the project's environmental documents. Visual preferences would be based on observation and review of planning and policy documents by local jurisdictions.

☑ ***Score 10-14***

A *VIA Memorandum* addressing minor visual issues that indicates the nature of the limited impacts and any necessary mitigation strategies that should be implemented would likely be sufficient along with an explanation of why no formal analysis is required.

☐ ***Score 6-9***

No noticeable physical changes to the environment are proposed and no further analysis is required. Print out a copy of this completed questionnaire for your project file to document that there is no effect. A *VIA Memorandum* may be used to document that there is no effect and to explain the approach used for the determination.

Visual Impact Assessment Definitions

The FHWA guidelines recognize three types of visual resources:

- **Natural visual resources** include landforms and land cover such as trees, vegetation, and water.
- **Cultural visual resource**s include manmade elements such as roadways, embankments, bridges, and buildings
- **Project visual resources** include the existing highway's geometrics, structures, and fixtures and those that will be placed in the environment as part of the proposed project.

The overall composition of visual resources helps determine the **visual character** of a scene or landscape. For highway project assessment purposes, visual resources and character are considered from two perspectives:

1. The view of the project to the surrounding community (neighbors).
2. The view from the project to motorists (travelers).

Neighbors who can see a highway project and travelers who use it are defined as **viewers**.

Visual resource changes are assessed by considering the compatibility and/or contrast of the proposed projects with the visual character of existing environments. Viewer responses to these changes are predicted by considering both exposure and sensitivity.

Viewer exposure considers the physical limits of the views and the number and type of viewers. **Viewer sensitivity** considers the expectations of viewers based on existing environments and the extent to which various visual resources may be important to them.

The predicted viewer response to changes in the existing landscape are used to determine **visual quality** impacts. Potential impacts may be identified as neutral, adverse, or beneficial and described in the following terms:

- Extent – Are the effects site-specific, local, or even regional?
- Duration – Are the effects temporary or permanent, or short-term or long-term?
- Scale – Are the effects negligible, minor, moderate, or major?

Potential impact durations are defined below.

- Short-term – during construction.
- Short/medium-term – 1 to 5 years while new vegetation becomes established after construction.
- Medium/long-term – 5 to 15 years after construction when new vegetation would be effective mitigation.
- Long-term – Over 15 years.

Potential impact scales are defined below.

Negligible: Changes would be non-detectable or, if detected, effects would be slight and local. Impacts would not require mitigation.

Minor: Changes would be noticeable, although the changes would be small and localized. Conventional mitigation measures may be necessary to reduce potential effects.

Moderate: Changes would be noticeable and have localized and potentially regional scale impacts; historical conditions would be altered. Conventional mitigation measures may be necessary to reduce potential effects.

Major: Changes would be noticeable and would have substantial consequences on a local and/or regional level. Mitigation measures to offset the effects would be required to reduce impacts, although long-term changes to the resource would be possible.

Appendix G – Cultural Resources

THE DEPARTMENT OF ARKANSAS
HERITAGE

Asa Hutchinson
Governor

Stacy Hurst
Director

Arkansas Arts Council

Arkansas Natural
Heritage Commission

Arkansas State Archives

Delta Cultural Center

Historic Arkansas Museum

Mosaic Templars
Cultural Center

Old State House Museum

ARKANSAS HISTORIC
PRESERVATION PROGRAM

1100 North Street
Little Rock, AR 72201

(501) 324-9880
fax: (501) 324-9184
tdd: 711

e-mail:
info@arkansaspreservation.org
website:
www.arkansaspreservation.com

An Equal Opportunity Employer

May 14, 2018

Mr. Bill McAbee
Garver USA
4701 Northshore Drive
North Little Rock, AR 72118

RE: Clark – Arkadelphia
Section 106 Review – FHWA
Arkadelphia Bypass from Hwy. 67 to Hwy 51/8
ARDOT Job No. 070442
Hwy. 67 – Hwy. 51 (Arkadelphia Bypass) P.E.
AHPP Tracking Number: 101106

Dear Mr. McAbee:

This letter is in response to your inquiry regarding properties of archeological, historical, or architectural significance in the area of the proposed referenced project. The staff of the Arkansas Historic Preservation Program (AHPP) has reviewed records pertaining to the area in question.

A records check found several previously recorded archeological sites in the general area of this undertaking. The Arkansas 7/51 Bridge-CL0950 and Missouri Pacific Railroad Depot-CL0193 are listed in the National Register of Historic Places (NRHP) while the Ouachita River Railroad Bridge-CL0121 is eligible for listing. In addition, there are numerous historic structures in the proposed study area that have not been evaluated for eligibility for listing in the NRHP. Because so little work has been undertaken in the proposed study area previously, we recommend that a cultural resources survey be conducted in the area of potential effect (APE).

Tribes that have expressed an interest in the area include the Caddo Nation (Ms. Tamara Francis), the Chickasaw Nation (Ms. Karen Brunso), the Choctaw Nation of Oklahoma (Dr. Ian Thompson), the Osage Nation (Dr. Andrea Hunter), the Quapaw Tribe of Oklahoma (Mr. Everett Bandy), and the Shawnee Tribe of Oklahoma (Ms. Kim Jumper). We recommend that they be consulted in accordance with 36 CFR § 800.2 (c) (2).

Thank you for the opportunity to review this undertaking. Once the undertaking is further along in the planning stages, we look forward to reviewing the updated information. If you should have any questions or comments, please do not hesitate to contact Theresa Russell of my staff at (501)-324-9357.

Sincerely,

Scott Kaufman
Director, AHPP

cc: Dr. Andrea Hunter, Osage Nation
Dr. Ann Early, Arkansas Archeological Survey

ARCHITECTURAL RESOURCES SURVEY FOR THE ARKADELPHIA SOUTH BYPASS (JOB NO. 070442), CLARK COUNTY, ARKANSAS

Prepared for:

Garver Engineering
4701 Northshore Drive
North Little Rock, AR 72118

Prepared by:

Panamerican Consultants, Inc.
91 Tillman Street
Memphis, Tennessee 38111
Panamerican Project No. 38042

C. Andrew Buchner

C. Andrew Buchner, RPA
Principal Investigator

AUGUST 3, 2020

TABLE OF CONTENTS

1. INTRODUCTION 1
PROJECT BACKGROUND 1
PROJECT LOCATION 2
2. ARCHITECTURAL SURVEY 9
NRHP CRITERIA 10
RESOURCE DESCRIPTIONS 10
Structure A 10
Structure B 11
Structure C 16
Structure Area D 17
Structure E 17
Structure F 24
Structure G 30
Structure H 30
Structure I 30
SUMMARY 37
3. REFERENCES CITED 39

1. INTRODUCTION

Under subcontract with Garver Engineering, Panamerican Consultants, Inc. conducted an architectural resources survey (ARS) for submission to the Arkansas SHPO on behalf of the Arkansas Department of Transportation (ARDOT), Job No. 070442. This document is meant to partially meet the requirements of Section 106 of the National Historic Preservation Act.

PROJECT BACKGROUND

The ARDOT is proposing to construct a transportation bypass south of the city of Arkadelphia in Clark County, Arkansas. The bypass will run from Highway 51 and Interstate 30 in the west to Highway 51 east of the Ouachita River (Figures 1-01 and 1-02).

A preliminary assessment of the architectural resources located in portions of the project area was completed before the identification of specific alignments in April of 2018. The initial cultural constraints review was based on examination of Arkansas Archaeological Survey (AAS), Arkansas Historic Preservation Program (AHPP), National Register of Historic Places (NRHP) databases, and a brief field reconnaissance (Childress 2018). The 2018 assessment identified the historic Arkansas 7/51 bridge (CLØ950), built in 1933, currently listed in the National Register of Historic Places (NRHP; listed January 31, 2006), and the Union Pacific railroad bridge that crosses the Ouachita (CLØ121) (Figures 1-03 and 1-04). The Union Pacific railroad bridge has been determined eligible for listing in the NRHP but has not been formerly nominated. Neither bridge will be impacted by the alignment alternatives. Eight additional properties with an undetermined NRHP status were also identified, three of which appeared to be potentially significant. They are the Johnson-Davidson house (CLØ321), the Curry house (CLØ322), and the abandoned Dolly Dimple Flour Mill (CLØ192) (Figures 1-05 through 1-07). None of these structures would be directly impacted by the alignment alternatives.

The AHPP on-line database was reviewed again after the identification of the corridor alternatives. Previously identified properties, recorded between 1983 and 2000, are shown in Figure 1-08 and summarized in Table 1-01. They include four NRHP-listed properties (two structure complexes, a bridge, and an archaeological site), an NRHP-eligible bridge, and fifteen structures with an undetermined status. None of the listed or eligible properties is within or immediately adjacent to the corridor alternatives. Based on the 2018 field reconnaissance and the recently completed ARS, none of the other previously recorded structures that remain standing in the project area is considered eligible for listing in the NRHP. Other standing structures identified along the corridor alignments are described in Chapter 2.

A standard site files check was performed, and prior archaeological fieldwork within approximately 2 km of the project area alternatives was researched via the on-line Automated Management of Archeological Site Data in Arkansas (AMASDA) database (April 2018 and May 2020). Forty-one (41) previously recorded sites are mapped within the 2-km search radius near the proposed Arkadelphia Bypass project alternative alignments. The distribution is notable for a high proportion of post-Late Archaic prehistoric occupation and special-use areas both within the local floodplain and along the upland margins. Prehistoric sites have been identified within the developed portions of Arkadelphia and on the surrounding agricultural tracts. The focus of the aboriginal occupation in the region appears to have been near the confluence of Saline Bayou and the Ouachita River in the vicinity of the Bayou Sel (3CL27) and Hardman (3CL418) sites.

Local historic period sites include residential and commercial archaeological deposits, standing structures, farmsteads, fords, and cemeteries. Several of the historical site trinomials are assigned to archival map locations that have not been demonstrated to possess associated archaeological deposits. Two archaeological sites have been recommended or determined

eligible for listing in the NRHP (Hardman 3CL418 and Barkman House 3CL450), three sites are listed (Bayou Sel 3CL27, Magnolia Manor 3CL768, and Rose Hill Cemetery 3CL923), four have been recommended not eligible, two have been destroyed or buried, and the balance (thirty) have an undetermined status.

Only two of the archaeological sites identified in the literature and records search (Radio Station 3CL154 and 3CL397) fall directly within the footprint of the alternative alignments. The Radio Station site was originally identified by a local amateur in 1971. A number of Archaic projectile points were found here in an area covering no more than about 150 m^2. An archaeologist conducting fieldwork in the site area during 1986 found no additional prehistoric material, but the project corridor examined appears to have been just west of the mapped site location (Williams 1987:4-6). The site area was not accessible during the 2018 field reconnaissance of the area, and no professional assessment of the site area has been accomplished since the initial identification made in 1971.

Site 3CL397 was identified in 1984 and assessed again in 1986 (Williams 1987:6-7). Although the status of the site is listed as undetermined, Williams recommended no further work at the 3CL397 prior to the pipeline excavation work performed in the area. The pipeline construction impacted the northern portions of the plowzone scatter.

The results of the AMASDA literature and records search suggests that all of the alternative alignments have a moderate to high probability of overlapping unidentified prehistoric archaeological sites within the Ouachita River floodplain and adjacent upland margins. The most complex and extensive archaeological complexes in the area are near the mouth of the Saline River at the terminus of alternative G just east of the Ouachita River.

PROJECT LOCATION

The Job. No. 070442 corridor alignments can be identified on the Arkadelphia, AR 7.5-min. quad within portions of Sections 16, 17, 18, 19, 20, 21 and 30 of T7S R19W, and Sections 24 and 25 of T7S R20W.

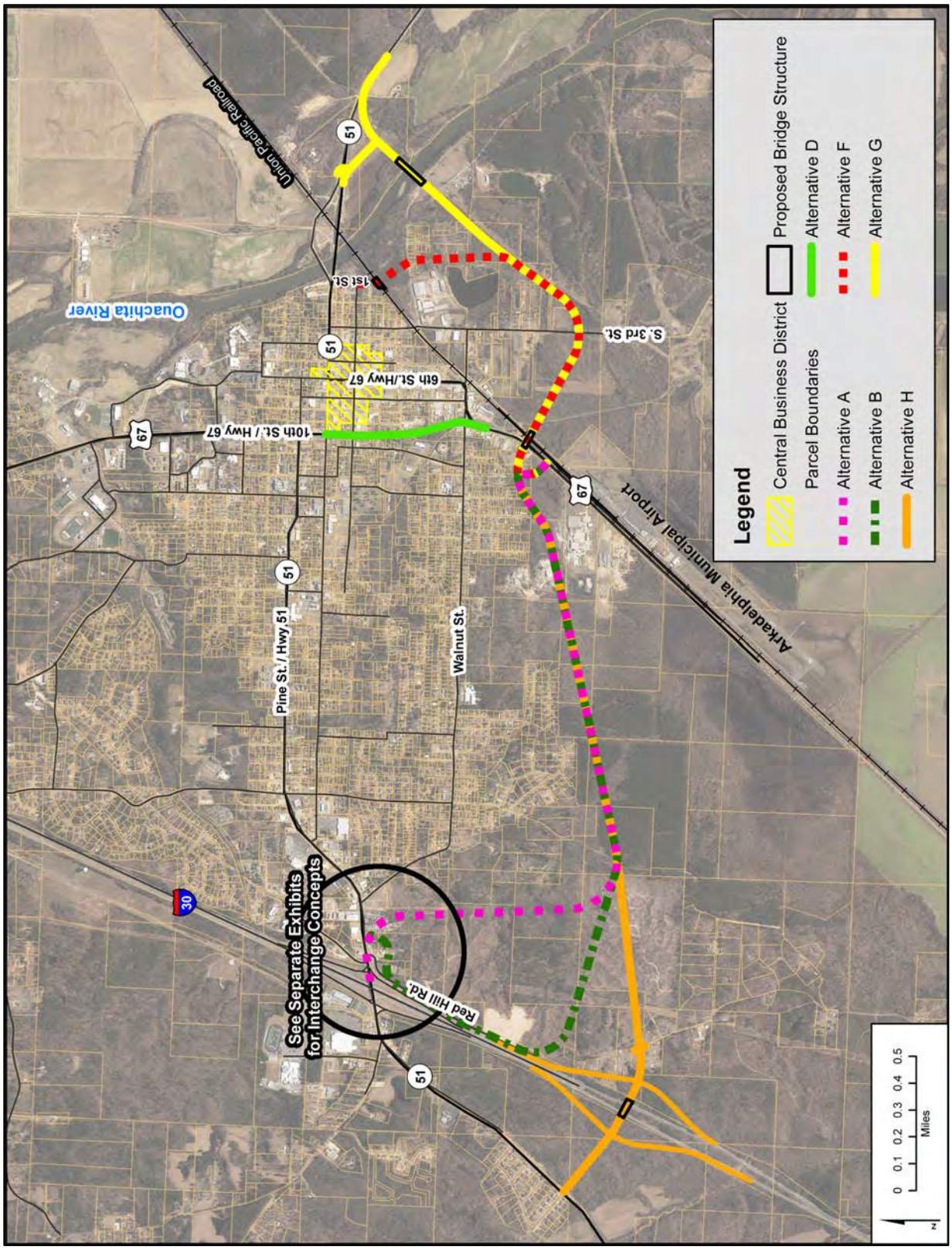


Figure 1-01. Arkadelphia South location map (courtesy: Garver).

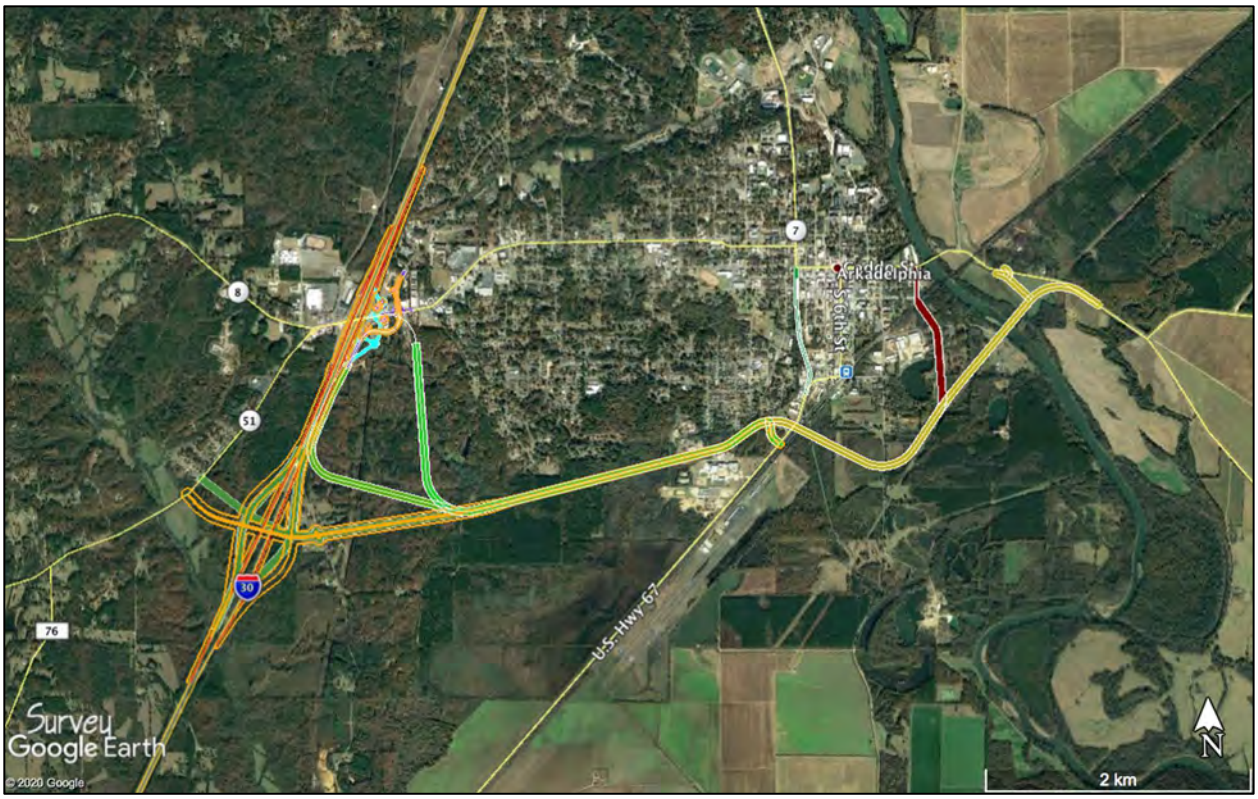


Figure 1-02. Arkadelphia South location map with Alternative H interchange modifications.

Figure 1-03. NRHP-listed Arkansas 7/51 bridge (CLØ950) over the Ouachita River, view east (DSCN 1312).

Figure 1-04. NRHP-eligible Union Pacific railroad bridge (CLØ121), view west (DSCN 1315).

Figure 1-05. Johnson-Davidson house (CLØ321), 122 Clinton Street, view northwest (IMG_2540).

Figure 1-06. Curry house (CLØ322), 121 Clinton Street, view south (IMG_2541).

Figure 1-07. Dolly Dimple Flour Mill (CLØ192), Nolin Drive and Walnut, view northeast (IMG_2544).

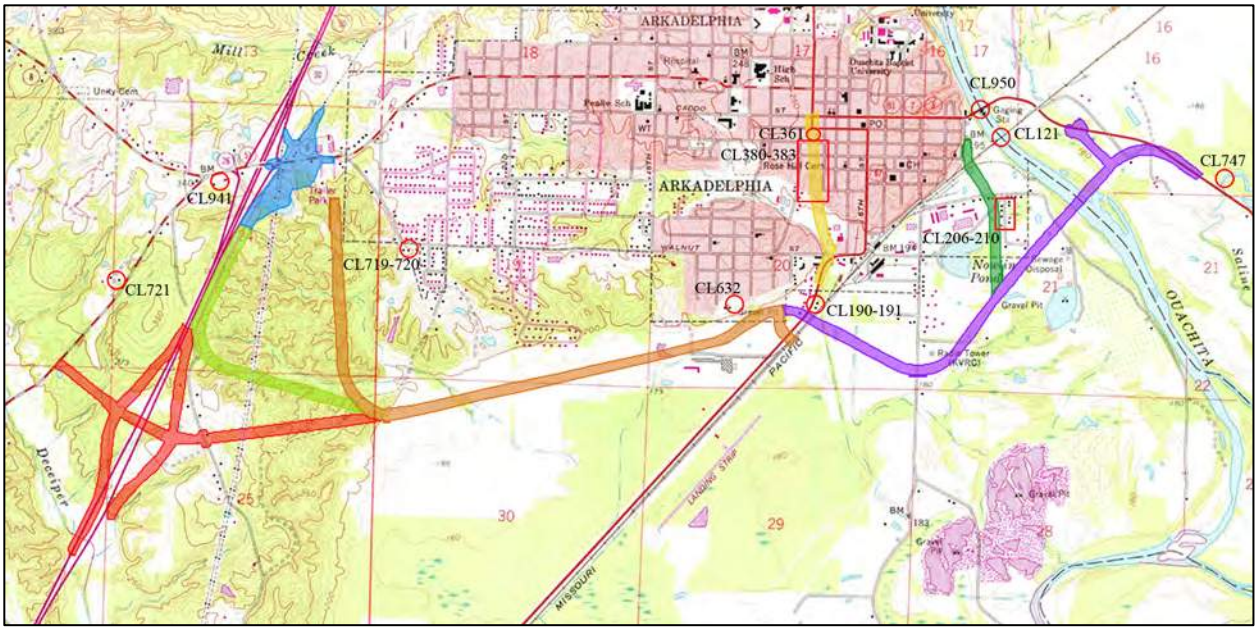


Figure 1-08. Previously recorded AHPP properties in the project area, Arkadelphia 7.5-minute USGS quadrangle.

Table 1-01. Summary of previously recorded AHPP properties near the alignments.

Property	Name	Location	Style	NRHP Status
CLØ121	Ouachita Railroad bridge	-	-	eligible
CLØ190	Cities Service Station	US 67	Plain/traditional	undetermined
CLØ191	Sea Inn Café	US 67	Spanish/Mission Revival	undetermined
CLØ200	Bullock house	Hemphill	-	N/A (gone)
CLØ201	Miller house #1	Hemphill	-	N/A (gone)
CLØ202	Miller house #2	Hemphill	-	N/A (gone)
CLØ203	Walton house	Hemphill	-	N/A (gone)
CLØ204	Newburn house	Hemphill	-	N/A (gone)
CLØ206	Nolan house	714 C St.	Plain/traditional	undetermined
CLØ207	Nolan-Garland house	716 C St.	Plain/traditional	undetermined
CLØ208	McClure house	701 C St.	Plain/traditional	undetermined
CLØ209	McClure property	705 C St.	Plain/traditional	undetermined
CLØ210	Nowlin property	712 C St.	Plain/traditional	undetermined
CLØ361	Lamb house	900 Main St.	English Revival	undetermined
CLØ380	Rob Bethea house	925 Clay	Queen Anne/Eastlake	undetermined
CLØ381	Thaddeus Moreland estate	505 S. 9th St.	Plain/traditional	N/A (gone)
CLØ382	Loe Carter house	521 S. 9th St.	Plain/traditional	N/A (gone)
CLØ383	McClean house	523 S. 9th St.	English Revival	N/A (gone)
CLØ632	Clifford W. Leath House	1040 S. 13th St.	Plain/traditional	undetermined
CLØ719	McAnally House	2801 Walnut	-	undetermined
CLØ721	Williams House	2707 Walnut	Queen Anne/Eastlake	undetermined
CLØ721	Magnolia Manor	Hollywood Road	Plain/traditional	listed
CLØ747	Bayou Sel (3CL27)	-	archaeological site	listed
CLØ941	C.E. Thompson Store	3100 Hollywood Road	Craftsman	listed
CLØ950	Arkansas 7/51 bridge	-	-	listed

Page intentionally blank

2. ARCHITECTURAL SURVEY

The architectural assessment was conducted on April 24, 2018 and May 20-22, 2020. A total of 54 individual structures, bridges, and facilities located along and near the alignments were recorded using field notes and photography. Post-field data analysis using the Clark County Assessor's records, as well as archival map sources, revealed that there are nine (9) extant or recently recorded structures or structure groups (A through I) within or close to the alignments that are more than 50 years old (Table 2-01). Most of the standing structures are along the Alternative D (green) corridor between South 9th and 10th Streets (Figure 2-01).

Table 2-01. Summary of properties >50 years old in or near the alignments.

Structure	AHPP	Year Built	Description	NRHP
A	-	ca. 1950s	Grace Fellowship Church Building	NE
B	-	ca. 1930s	Forrest R. Wade barn/shed complex	NE
C	-	ca. 1950s	ANG Co. Building 83	NE
D	-	1945	Hendry Oil Co. Buildings	NE
E	-	ca. 1940s	Dorsey House	NE
F	-	ca. 1950s	West House	NE
G	-	ca. 1950s	Holliman House	NE
H	CLØ380	ca. 1920s	Rob Bethea House	NE
I	CLØ361	ca. 1920s	Lamb House	NE

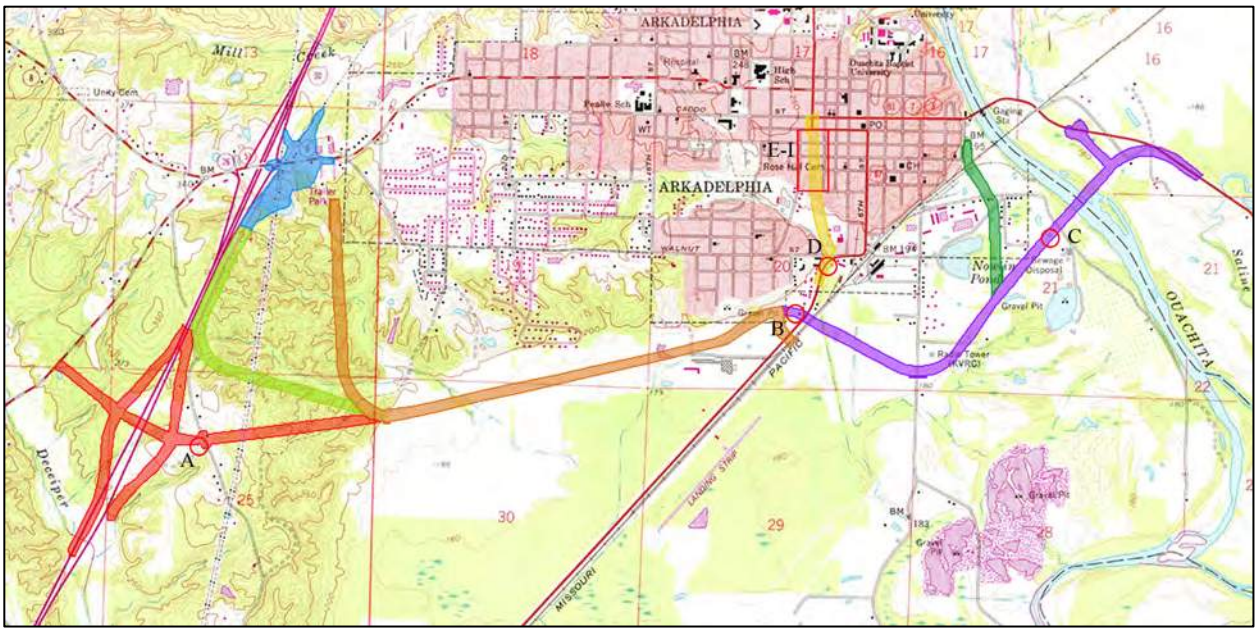


Figure 2-01. Distribution of structures >50 years old on the Arkadelphia, AR 7.5-min. quad.

Most of the southern and western portions of the alternative alignments are in wooded parcels. A limited number of roads intersect the proposed rights-of-way and consequently few structures of any age are mapped here. At the interchange modification area around Red Hill Road and

Pine Street most of the structures are relatively recent commercial properties. There is also a small mobile home park in this vicinity at the terminus of Alternative A. Most of the documented structures in the ARS are located along the Alternative D corridor between 9th and 10th Streets. All structures identified are west of the Ouachita River.

NRHP CRITERIA

The National Register of Historic Places outlines four criteria by which cultural resources should be evaluated (see King 1998:75-80):

The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

(a) that are associated with events that have made a significant contribution to the broad pattern of our history; or:

(b) are associated with the lives of persons significant in our past; or

(c) that embody the distinctive characteristics of a type, period or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

(d) that have yielded or may be likely to yield, information important in prehistory or history.

Criterion D is most often applied to archaeological sites, but standing structures and other kinds of properties can be eligible under this criterion as well [e.g., "a building . . . . can be studied to learn about 18th-century carpentry" (King 1998:77)]. Standing structures eligible under Criterion D are also arguably eligible under Criterion A, since the important information it might be likely to yield would almost certainly be an element of the broader pattern of historical property significance. A thorough consideration of site/standing structure integrity is required for NRHP evaluation of properties regardless of the specific criteria employed.

Most significantly, none of the documented properties identified in the study area are considered eligible for listing in the NRHP as individual properties or as part of a potential Historic District.

RESOURCE DESCRIPTIONS

STRUCTURE A

Panamerican's recommended NRHP Status:.....Not Eligible
Address .....469 Red Hill Road (ID 01-04709-000)

Structure A is a ca. 1950s one-story communal building (Grace Fellowship Church) located on a 1.4-acre lot along Red Hill Road within the proposed Alternative H interchange area (Figures 2-02 and 2-06). A structure is shown in the same location on the 1959 USGS 7.5-minute quadrangle, but the absence of a building date on the Clark County real estate assessment record makes it difficult to determine if the current Grace Fellowship Church building is the same one shown (a structure shown directly across the road is now demolished). If this is the original building on the parcel the sheet metal roof and vinyl siding located in the dormer are replacement materials.

The building appears to be on a concrete slab and the façade is concrete block. It has a low, double-pitched gable sheet metal roof. Double-hung windows are aluminum with faux shutters. A small "yard barn" and canopy are located behind the building. The Structure A floor plan is rectangular covering 4,125 ft^2. Church property extends to the north on to a 2.0-acre parcel.

In the opinion of Panamerican, Structure A is not eligible for listing in the NRHP because it meets none of the established criteria. It is not known to be associated with any significant events or persons, thus Criteria A (association) and B (prominent individuals) do not apply. The building does not represent the distinctive characteristics of a type, the work of a master, nor does it posses any high artistic value (Criterion C, Design/Construction). While Criterion D (Information Potential) can be applied to buildings, Structure A appears to offer little future research potential, thus Criterion D is not applicable.

STRUCTURE B

Panamerican's recommended NRHP Status: ..... Not Eligible
Address ..... U.S. Highway 67 (ID 74-03834-004)

Structure B is a ca. 1930s rural agricultural building group located on a 3.0-acre lot behind the Forrest R. Wade cabinet shop (Figures 2-07 through 2-11). The primary small barn, which sits in the Alternative F and G corridor, is not shown on the 1959 Arkadelphia USGS 7.5' quad sheet. Clark County property records do not show Structure B as an improvement to this parcel. The barn has a corrugated sheet metal-covered gable roof and a rectangular plan (ca. 16 by 30 feet) covering about 480 ft^2. The exterior is both vertical and horizontal unpainted board siding. Openings to the interior are restricted to the eastern end of the barn. There are no barn doors. A partially collapsed sheet metal covered shed roof is on the northern side of the building. The interior of the structure was not examined. The owner stated that the barn was used for storage.

Figure 2-02. Photo of Structure A on Red Hill Road, view west-northwest (DSCN1275).

Figure 2-03. Photo of Structure A front facade view west (DSCN1344).

Figure 2-04. Oblique view of Structure A, view northwest (DSCN1345).

Figure 2-05. Oblique view of Structure A rear facade view northeast (DSCN1347).

Figure 2-06. "Yard barn" and canopy cover behind Structure A, view northwest (DSCN1346).

Figure 2-07. Photo of Structure B and plywood tractor cover on US-67, view northwest (DSCN1336).

Figure 2-08. Photo of Structure B eastern facade, view west (DSCN1337).

Figure 2-09. Photo of Structure B front façade, view west (DSCN1359).

Figure 2-10. Photo of Structure B north façade, view south (DSCN1360).

Figure 2-11. Oblique view of Structure B front and south façade, view northwest (DSCN1361).

In the opinion of Panamerican, Structure B is not eligible for listing in the NRHP because it meets none of the established criteria. It is not known to be associated with any significant events or persons, thus Criteria A (association) and B (prominent individuals) do not apply. The building does not represent the distinctive characteristics of a type, the work of a master, nor does it posses any high artistic value (Criterion C, Design/Construction). While Criterion D (Information Potential) can be applied to buildings, Structure B appears to offer little future research potential, thus Criterion D is not applicable.

STRUCTURE C

Panamerican's recommended NRHP Status: ..... Not Eligible
Address ..... Hemphill Road (no parcel ID)

Structure C, recorded as "A.N.G. Co. BLDG 83", is a ca. 1950s industrial storage building located in an overgrown area off of Hemphill Road near a gas pipeline facility (Figures 2-12 through 2-16). A recently storm-toppled elm tree has damaged some of the exterior sheathing on the building. The building is located near the centerline of Alternative G just southeast of the main channel of the Ouachita River. A structure is shown in this location on the 1959 Arkadelphia USGS 7.5' quad sheet. The unit has a corrugated sheet metal-covered gabel roof and a rectangular plan (ca. 20 by 15 feet) covering about 300 ft^2. The exterior is vertical corrugated sheet metal. A double door opening is present on the northeastern facade. The interior of the structure was not examined in detail, but scattered containers and other debris was visible through the open doors. The building does not appear to be in active use as an industrial storage facility.

In the opinion of Panamerican, Structure C is not eligible for listing in the NRHP because it meets none of the established criteria. It is not known to be associated with any significant events or persons, thus Criteria A (association) and B (prominent individuals) do not apply. The building does not represent the distinctive characteristics of a type, the work of a master, nor does it posses any high artistic value (Criterion C, Design/Construction). While Criterion D (Information Potential) can be applied to buildings, Structure C appears to offer little future research potential, thus Criterion D is not applicable.

STRUCTURE AREA D

Panamerican's recommended NRHP Status:.....Not Eligible
Address .....695 Walnut Street (ID 74-03822-000)

Structure Area D contains a primary commercial building and several ancillary facilities dating to 1945 (Figures 2-17 through 2-24). The Hendry Oil Company property covers about an acre at the southern end of Alternative D. All of the improvements to the parcel are industrial metal structures. The main building has a rectangular plan (30 by 100 feet) covering about 3,000 ft^2. A porch is present on the east end. A 12 by 18 foot canopy roof covers fuel pumps north of the building. A small 8 by 14 foot outbuilding is also present on the lot.

AQccording to the corporate website, Hendry Oil Company was founded in 1994 when Dickie Hendry purchased Three Sisters Oil Company in Nashville, Arkansas. After many years in the logging industry, Mr. Hendry realized the need to service the logging industry with a reliable source of diesel fuel and specialty lubricants. He also saw the need for local farmers and school districts to have access to affordable fuel prices. Those clients continue to be the main core of the business. Hendry Oil Company also serves excavating companies, waste haulers, and road departments. Because the current business significantly post-dates the construction date of the primary buildings, the original function is unknown.

In the opinion of Panamerican, none of the Structure D area buildings are eligible for listing in the NRHP because they do not meet any of the established criteria. They are not known to be associated with any significant events or persons, thus Criteria A (association) and B (prominent individuals) do not apply. The buildings do not represent the distinctive characteristics of a type, the work of a master, nor do they posses any high artistic value (Criterion C, Design/Construction). While Criterion D (Information Potential) can be applied to buildings, the Structure D area appears to offer little future research potential, thus Criterion D is not applicable.

STRUCTURE E

Panamerican's recommended NRHP Status:.....Not Eligible
Address .....924 Main Street (ID 74-00438-000)

Structure E is a ca. 1940s plain/traditional style residence in the Alternative D corridor (Figures 2-25 through 2-30). No information on the date of construction for the property improvements is available on the county assessor's parcel record. An open lot is present to the west. The house has a conventional closed pier brick foundation and an asphalt shingle roof with an irregular floor plan covering about 1,378 ft^2. The exterior façade is covered in horizontal lap siding covered with aluminum lap siding. A small (16 by 10 foot) outbuilding is located in the rear of the lot. The sash windows are covered with aluminum awnings on the front façade.

An old-fashioned analog aerial television antenna above the roof indicates the house has not been updated for some time. This house appears to retain most of its original architectural features, although the aluminum awnings and siding were probably later additions. Roofing shingles have probably been replaced more than once since the house was constructed.

Figure 2-12. Photo of Structure C southeastern facade, view northwest (DSCN1296).

Figure 2-13. Photo of Structure C, view southwest (DSCN1298).

Figure 2-14. Structure C identification sign (DSCN1299)

Figure 2-15. Photo of Structure C northwestern facades, view southeast (DSCN1300).

Figure 2-16. Gas pipeline facility near Structure C, view southeast (DSCN1302).

Figure 2-17. Hendry Oil Company facility (Structure Area D), view south (DSCN1286).

Figure 2-18. Hendry Oil Company facility (Structure Area D), view south (DSCN1287).

Figure 2-19. Hendry Oil Company facility, rear facade (Structure Area D), view northeast (DSCN1349).

Figure 2-20. Hendry Oil Company facility, west end (Structure Area D), view east (DSCN1350).

Figure 2-21. Hendry Oil Company, oblique front facade (Structure Area D), view southeast (DSCN1353).

Figure 2-22. Hendry Oil Company facility, fuel pumps (Structure Area D), view south (DSCN1354).

Figure 2-23. Hendry Oil Company, front facade (Structure Area D), view south (DSCN1355).

Figure 2-24. Hendry Oil Company, pump cover (Structure Area D), view east (DSCN1352).

In the opinion of Panamerican, Structure E is not eligible for listing in the NRHP because it meets none of the established criteria. It is not known to be associated with any significant events or persons, thus Criteria A (association) and B (prominent individuals) do not apply. The building does not represent the distinctive characteristics of a type, the work of a master, nor does it posses any high artistic value (Criterion C, Design/Construction). While Criterion D (Information Potential) can be applied to buildings, Structure E appears to offer little future research potential, thus Criterion D is not applicable.

STRUCTURE F

Panamerican's recommended NRHP Status: .....Not Eligible
Address .....923 Clinton Street (ID 74-00435-000)

Structure F is a ca. 1950s English Revival residence in the Alternative D corridor (Figures 2-31 through 2-34). No information on the date of construction for the property improvements is available on the county assessor's parcel record. The house has a conventional closed pier foundation and an asphalt shingle roof with an irregular floor plan covering about 1,894 ft^2. The exterior façade is masonry veneer. An unattached garage is located in the rear of the lot.

In the opinion of Panamerican, Structure F is not eligible for listing in the NRHP because it meets none of the established criteria. It is not known to be associated with any significant events or persons, thus Criteria A (association) and B (prominent individuals) do not apply. The building does not represent the distinctive characteristics of a type, the work of a master, nor does it posses any high artistic value (Criterion C, Design/Construction). While Criterion D (Information Potential) can be applied to buildings, Structure F appears to offer little future research potential, thus Criterion D is not applicable.

Figure 2-25. Structure E, view north (DSCN1326).

Figure 2-26. Structure E eastern facade, view west (DSCN1368).

Figure 2-27. Oblique view of Structure E, view northwest (DSCN1369).

Figure 2-28. Structure E southwest corner and backhouse, view northeast (DSCN1370).

Figure 2-29. Oblique view of Structure E, view northeast (DSCN1371).

Figure 2-30. Structure E western facade and backhouse, view east (DSCN1372).

Figure 2-31. Structure F, view south (DSCN1327).

Figure 2-32. Structure F detached garage, view southeast (DSCN1384).

Figure 2-33. Structure F west facade, view east (DSCN1386).

Figure 2-34. Structure F, view southwest (DSCN1389).

STRUCTURE G

Panamerican's recommended NRHP Status: .....Not Eligible
Address .....1016 Clinton Street (ID 74-00290-000)

Structure G is a ca. 1950s plain/traditional style frame residence in the Alternative D corridor (Figures 2-35 through 2-37). No information on the date of construction for the property improvements is available on the county assessor's parcel record. The house has a conventional closed pier foundation, a screened front porch, an asphalt shingle roof, and an irregular floor plan covering about 2,268 ft^2. The exterior façade is horizontal lap siding. An unattached garage is located in the rear of the lot.

In the opinion of Panamerican, Structure G is not eligible for listing in the NRHP because it meets none of the established criteria. It is not known to be associated with any significant events or persons, thus Criteria A (association) and B (prominent individuals) do not apply. The building does not represent the distinctive characteristics of a type, the work of a master, nor does it posses any high artistic value (Criterion C, Design/Construction). While Criterion D (Information Potential) can be applied to buildings, Structure G appears to offer little future research potential, thus Criterion D is not applicable.

STRUCTURE H

Panamerican's recommended NRHP Status: .....Not Eligible
Address .....925 Clay Street (ID 74-00552-000)

Structure H, recorded by the AHPP in 1983 as the Rob Bethea House (CLØ380), is a ca. 1920s Queen Anne/Eastlake style frame residence in the Alternative D corridor (Figures 2-38 through 2-44). The house is currently unoccupied and unsecured. No information on the date of construction for the property improvements is available on the county assessor's parcel record. The house has a conventional closed pier foundation, an open front porch, an asphalt shingle roof, and an irregular floor plan covering about 2,016 ft^2. The exterior façade is horizontal lap siding. A dilapidated detached garage is in the rear. The original sash window have been replaced.

In the opinion of Panamerican, Structure H is not eligible for listing in the NRHP because it meets none of the established criteria. It is not known to be associated with any significant events or persons, thus Criteria A (association) and B (prominent individuals) do not apply. The building does not represent the distinctive characteristics of a type, the work of a master, nor does it posses any high artistic value (Criterion C, Design/Construction). While Criterion D (Information Potential) can be applied to buildings, Structure H appears to offer little future research potential, thus Criterion D is not applicable.

STRUCTURE I

Panamerican's recommended NRHP Status: .....Not Eligible
Address .....900 Main Street (ID 74-00432-000)

Structure I, recorded by the AHPP in 1983 as the Lamb House (CLØ361), is a ca. 1920s English Revival style frame residence in the Alternative D corridor (Figure 2-45 through 2-47). No information on the date of construction for the property improvements is available on the county assessor's parcel record. The house has a conventional closed pier foundation, a small open front porch/landing, a small uncovered side/front porch, an asphalt shingle roof, and an irregular floor plan covering about 1,735 ft^2. The exterior façade is masonry veneer. The gables and eaves are covered in vinyl lap siding.

Figure 2-35. Structure G, view north (DSCN1328).

Figure 2-36. Structure G, view northeast (DSCN1391).

Figure 2-37. Structure G, view northwest (DSCN1393).

Figure 2-38. Structure H, view south (DSCN1334).

Figure 2-39. Structure H western facade, view east (DSCN1375).

Figure 2-40. Structure H detail of plywood insert/replacement window, view east (DSCN1375).

Figure 2-41. Structure H front porch view southeast (DSCN1377).

Figure 2-42. Structure H detail of ceramic pavers on front walk, view south (DSCN1378).

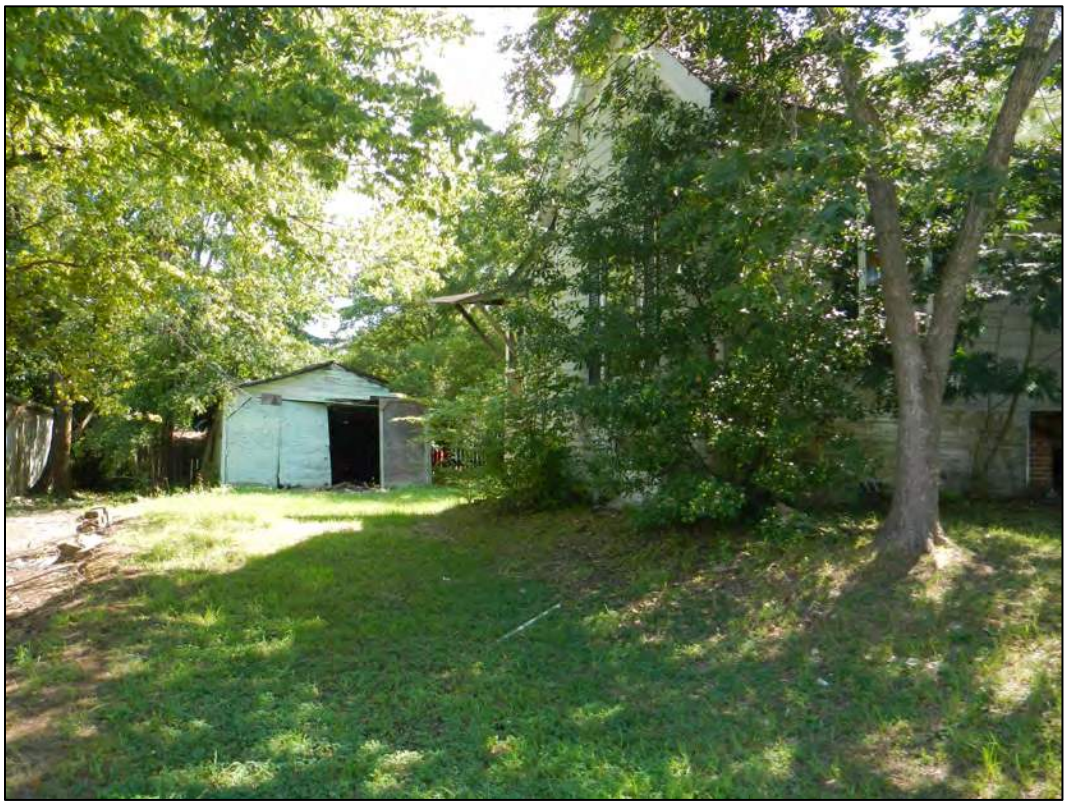


Figure 2-43. Structure H back-building, view south (DSCN1379).

Figure 2-44. Oblique view of Structure H, view southwest (DSCN1380).

Figure 2-45. Structure I, view north (Clark County Assessors office photo).

Figure 2-46. Structure I, view north (DSCN1367).

Figure 2-45. Structure I east facade, view west (DSCN1365).

In the opinion of Panamerican, Structure I is not eligible for listing in the NRHP because it meets none of the established criteria. It is not known to be associated with any significant events or persons, thus Criteria A (association) and B (prominent individuals) do not apply. The building does not represent the distinctive characteristics of a type, the work of a master, nor does it posses any high artistic value (Criterion C, Design/Construction). While Criterion D (Information Potential) can be applied to buildings, Structure I appears to offer little future research potential, thus Criterion D is not applicable.

SUMMARY

Review of the AHPP on-line database indicated that 25 properties were previously recorded within or near the various Arkadelphia Bypass alternative corridors. Many of the previously recorded properties were found to be no longer standing. The remainder of the properties include four NRHP-listed sites (two structure complexes, a bridge, and an archaeological site), an NRHP-eligible bridge, and fifteen structures with an undetermined status. None of the listed or eligible properties is within or immediately adjacent to the corridor alternatives.

The architectural resources survey was conducted on April 24, 2018 and May 20-22, 2020. A total of 54 individual structures, bridges, and facilities located along and near the alignments were recorded using field notes and photography. Post-field data analysis using the Clark County Assessor's records, as well as archival map sources, revealed that there are nine (9) extant or recently recorded structures or structure groups (A through I) within or close to the alignments that are more than 50 years old. Most of the standing structures are along the Alternative D (green) corridor between South 9th and 10th Streets just south of the Arkadelphia Central Business District. Based on the 2018 field reconnaissance and the recently completed

ARS, none of the other previously recorded structures that remain standing in the project area is considered eligible for listing in the NRHP.

3. REFERENCES CITED

Childress, M.R.
2018 Preliminary Cultural Resources Assessment for the Arkadelphia South Bypass Project, Clark County, Arkansas. Panamerican Consultants, Memphis. Submitted to Garver Engineering Service, Little Rock.

King, T.F.
1998 *Cultural Resources Laws & Practice: An Introductory Guide*. AltaMira Press, Walnut Creek, California.

Williams, I.
1987 *An Archaeological Resurvey of Three Sites along the Arkla, Inc. Line-S Replacement Pipeline in Clark County, Arkansas*. Sponsored Research Program, Arkansas Archeological Survey, Fayetteville. Project Report No. 619 submitted to Arkla Energy Resources, Shreveport, Louisiana (AMASDA Report No. 852).

Appendix H – Wetlands Assessment

Wetlands Assessment

This assessment serves to provide information on the occurrence of jurisdictional waters (e.g., streams and wetlands) for the proposed Arkadelphia Bypass EA project located in Arkadelphia, Clark County, Arkansas. The purpose of the project is to improve safety, mobility, and connectivity in Arkadelphia. Specific goals of the project are to provide:

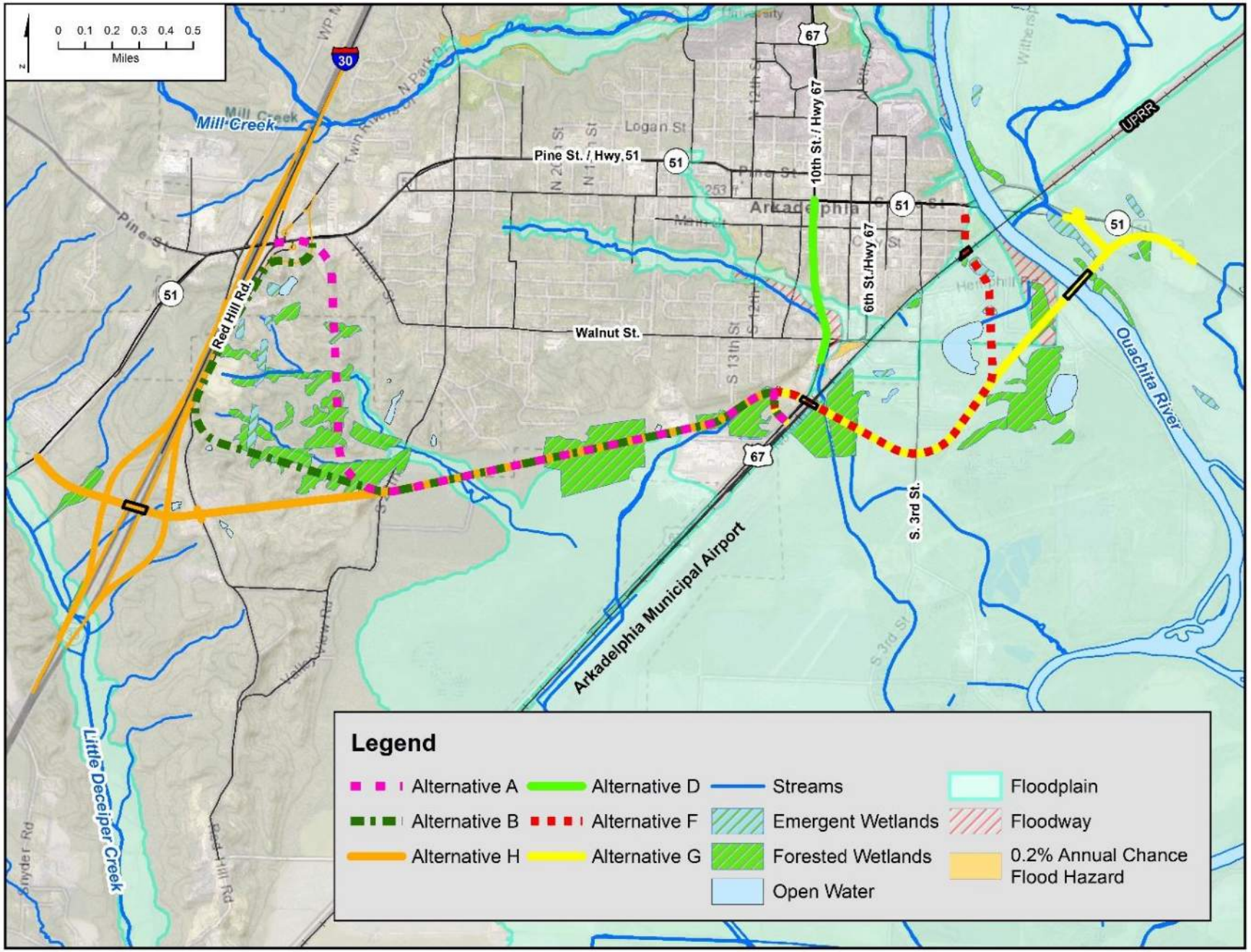
- An alternate route to reduce the number of logging and other heavy-duty trucks traveling through the downtown area;
- A more direct east-west travel route for both local and through traffic; and
- I-30/Hwy. 51 interchange modifications to reduce traffic congestion and increase emergency vehicle access to and from the Baptist Hospital.

The project includes evaluating several alternative alignments in an Environmental Assessment (EA) as part of complying with the National Environmental Policy Act (NEPA). Refer to the EA document for detailed information on the alignment of each Alternative. The project is receiving federal funding and federal permits, and the Federal Highway Administration (FHWA) is acting as the lead Federal agency.

In accordance with Executive Order 11990, which requires that impacts to wetlands be considered in federal undertakings, impacts to potentially jurisdictional waters and wetlands were evaluated. A desktop review of waters and wetlands within the entire project area was conducted and results are presented below. Once the preferred alternatives are selected, a formal wetland delineation on the preferred alignment will be conducted and submitted to the United States Army Corps of Engineers (USACE) as part of the Section 404 permitting process and the appropriate Section 404 permit will be determined at that time. Unavoidable impacts would be mitigated by using an approved wetland mitigation bank for the areas impacted by the selected alternative.

This desktop delineation utilized current and historical aerial photography, topographic quadrangles, hydric soils data from Natural Resources Conservation Service (NRCS), and observational data collected during the limited April 25, 2018 site visit. The assessment revealed that the project area contains three perennial streams (the Ouachita River, Mill Creek, and Little Deceiper Creek), several intermittent streams (unnamed tributaries to the above-listed streams), and numerous emergent and forested wetlands. Floodplain impacts were assessed based on data provided by Federal Emergency Management Agency (FEMA). **Figure 1** shows the wetlands, streams, and floodplains located in the project study area.

Figure 1: Wetlands, Streams, and Floodplains within the Study Area



Wetlands within the right-of-way footprint of each build alternative would be permanently cleared/filled in order to construct the proposed roadways and/or interchanges. Streams likely would be impacted by the placement of culverts in order to convey stream flow below the proposed roadway. **Table 1** summarizes the number of stream crossings required for each alternative evaluated in the EA, as well as the total acres of impacted wetlands under each alternative. The number of parallel stream crossings (versus perpendicular) are also quantified as parallel crossings typically result in significantly more linear feet of impact to watercourses.

Table 1: Wetland and Stream Impacts

Location	Build Alternative	Wetland Impacts	Number of Stream Crossings		
			Perpendicular Crossings	Parallel Crossings	Total Crossings
West Bypass	Alternative A	25.3 acres	4	1	5
	Alternative B	23.2 acres	2	1	3
	Alternative H	20.0 acres	9	3	12
East Bypass	Alternative D	0 acres	0	1	1
	Alternative F	7.2 acres	3	0	3
	Alternative G	9.4 acres	3	0	3
Interchange Alternative	Alternative 1	0 acres	0	0	0
	Alternative 1A	0 acres	0	0	0
	Alternative 2	0.2 acres	0	0	0
	Alternative 3	0 acres	0	0	0

For Interchange Alternatives, Interchange Alternatives 1, 1A, and 3 incur no wetland impacts while Alternative 2 will require 0.2 acre of impact to wetlands. None of the Interchange Alternatives require stream crossings.

Of the West Bypass Alternatives, Alternative H requires the largest number of stream crossings and Alternative B has the fewest number of stream crossings. Alternative H has the least number of wetland impacts and Alternative A requires the largest amount of wetland impacts. Of the east bypass alternatives, Alternative F requires the fewest impacts to wetlands and streams and Alternative G requires the greatest. One of Alternative G's stream crossings occurs at the Ouachita River and will involve construction of a new span bridge. Approximately 1.3 miles upstream of the proposed bridge, the Ouachita River is considered an Ecologically Sensitive Waterbody (ESW) by the Arkansas Department of Environmental Quality (ADEQ). Overall, Alternative D will

incur the least amount of impacts to water resources compared to the other build alternatives.

For any of the bypass alternatives, most stream impacts should be minor; however, for those alternatives located parallel to a stream, construction may result in the realignment of the stream. Secondary and cumulative impacts should be similar between the proposed bypass alternatives. Temporary impacts to water quality have the potential occur during the construction phase of the project due to increased soil disturbance and associated runoff resulting from land clearing, culvert construction, and construction equipment. Upon project completion and vegetation regrowth, water quality should return to pre-construction levels.

In addition to a Section 404 permit, the Selected Alternative (once identified) will obtain coverage under the National Pollutant Discharge Elimination System (NPDES) general permit for Construction Activities (as required by Section 402 of the CWA). The provisions of this permit include preparation of a Stormwater Pollution Prevention Plan (SWPPP), which contains a selection of Best Management Practices (BMPs) to be implemented to effectively reduce or prevent the discharge of pollutants into receiving waters during and after construction activities. Therefore, stormwater runoff will be controlled and monitored according to applicable federal regulations. Additionally, water quality regulations required by the ADEQ state Water Quality Certification (Section 401 of the CWA) will be implemented.

Appendix I – Protected Species

Job Number 070442

Protected Species

This assessment serves to provide information on the occurrence of suitable habitat for the federally listed threatened and endangered species for the proposed Arkadelphia Bypass EA project located in Arkadelphia, Clark County, Arkansas. The purpose of the project is to improve safety, mobility, and connectivity in Arkadelphia. Specific goals of the project are to provide:

- An alternate route to reduce the number of logging and other heavy-duty trucks traveling through the downtown area;
- A more direct east-west travel route for both local and through traffic; and
- I-30/Hwy. 51 interchange modifications to reduce traffic congestion and increase emergency vehicle access to and from the Baptist Hospital.

The project includes evaluating several alternative alignments in an Environmental Assessment (EA) as part of complying with the National Environmental Policy Act (NEPA). The project is receiving federal funding and federal permits, and the Federal Highway Administration (FHWA) is acting as the lead Federal agency.

In accordance with the Endangered Species Act of 1973, federally listed threatened and endangered species were identified for the proposed action area with the use of the USFWS's online Information, Planning, and Conservation (IPaC) decision support system. The USFWS IPaC Official Species List indicated that ten (10) federally listed threatened or endangered species have the potential to be present in or migrate through the project's location. Additionally, the Eastern Black Rail (listed by the IPaC as "Proposed Threatened") is on the USFWS Official Species List, which is attached to this document. Information on known habitat types were reviewed and additional information required was researched. Habitat details and assessments are provided below in **Table 1** for Bypass Alternatives A, B, D, F, G, and H, and Interchange Alternatives 1, 1A, 2, and 3. Additionally, a list of species of concern was also obtained from the Arkansas Natural Heritage Commission (ANHC). ANHC searched their records and provided a list of 15 species that they believe have the potential to occur within or near (a 1-mile radius of) the project area. Of these 15 species, four are listed as a species of Federal Concern and are assessed in **Table 1**. At present, Arkansas does not have a law providing special protection to state listed species considered endangered or threatened in Arkansas. Nevertheless, the 11 species classified as State Concern were considered in the analysis of this document with preliminary habitat assessments and impacts provided in **Table 2**. Refer the EA document for details on each Alternative's alignment. The assessment of habitat suitability is based on desktop research and the limited site visit conducted April 25, 2018.

Job Number 070442

Table 1: Habitat Assessment and Preliminary Impacts to Federally Listed T&E Species

Northern Long-eared Bat (*Myotis septentrionalis)* - Threatened	
Habitat Requirements: Northern long-eared bats (NLEB) winter in caves and spend summer in forested areas of the state where they may utilize suitable summer roost trees. Roosting and maternity habitat consists primarily of live or dead hardwood trees that are 3-inches or greater in diameter and have exfoliating bark that provides space for bats to roost between the bark and the bole of the tree. Suitable summer roost habitat also includes the use of trees with cavities, splits, crevices, hollow sections, and other damage.	
Habitat Assessment	**Habitat Impacts?**
All Build Alternatives: The project appears to occur in the NLEB consultation area but is outside of a 3-mile buffer for a NLEB known hibernaculum or a NLEB known maternity roost. No known caves are present within or near the project site. However, potentially suitable habitat (e.g., live and dead trees with crevices, cavities, and/or exfoliating bark) is assumed to be present within wooded areas, which occur within the footprint of all build alternatives, including interchange alternatives. Tree clearing along the route of each build alternative will be required in order to construct the proposed roadway and/or interchange. All required tree clearing will occur during the winter season/hibernation (i.e., between November 15 and March 14), otherwise appropriate surveys will be conducted. Estimated acreages of tree clearing are as follows: • 56 acres for Alt. A • 55 acres for Alt. B • 138 acres for Alt. H • 2 acres for Alt. D • 19 acres for Alt. F • 16 acres for Alt. G • 1.9 acres for Interchange Alt. 1 • 1.0 acres for Interchange Alt. 1A • 2.2 acres for Interchange Alt. 2 • 2.3 acres for Interchange Alt. 3	Yes
Eastern Black Rail (*Laterallus jamaicensis ssp. jamaicensis*) - Proposed Threatened	
Habitat Requirements: Eastern black rails occupy wetlands and marshes in areas of moist soil or shallow flooding. They require dense vegetative cover that allows movement underneath the canopy, such as rushes, sedges, and grasses. Water must stay shallow (0-3 cm) during breeding season, as higher water levels can flood nests and drown chicks. The species is likely a vagrant in Arkansas, passing through during migration.	
Habitat Assessment	**Habitat Impacts?**
Alternative D and Interchange Alts. 1, 1A, and 3: There are no known wetlands or marshes within the impact footprint of these build alternatives.	No Effect
Alternatives A, B, F, G, and H; Interchange Alt. 2: Wetlands or marshes are present within the impact footprint of these build alternatives and may contain suitable habitat for the eastern black rail. These wetlands would be cleared/filled in order to construct the proposed roadways and/or interchanges. Estimated acreages of impacted wetlands are as follows: • 25 acres for Alt. A • 23 acres for Alt. B • 20 acres for Alt. H • 7 acres for Alt. F • 9 acres for Alt. G • 0.2 acres for Interchange Alt. 2	Yes
Piping Plover (*Charadrius melodus*) - Threatened	
Habitat Requirements: Piping Plovers are small, migratory shorebirds that inhabit beaches, shorelines, dry lakebeds, sandbars of major rivers, salt flats, and mudflats of reservoirs.	

Job Number 070442

Habitat Assessment	Habitat Impacts?
Alternatives A, B, D, F, and H; Interchange Alts. 1, 1A, 2, and 3: No beaches, shorelines, dry lakebeds, sandbars, salt flats, or mudflats are anticipated within the impact footprint of these build alternatives. Additionally, the species is only an occasional visitor to Arkansas, making brief stops during migration.	No Effect
Alternative G: Sandbars along the Ouachita River are present within and adjacent to the impact footprint of Alternative G, which will construct a new bridge over the River. Some in-stream activity may be required during bridge construction, including installation of one or more piers. Although, proper erosion control best management practices will be utilized throughout the project construction to minimize sedimentation downstream, existing habitat may be impacted. Conversely, the addition of in-stream structures (if required) may also indirectly result in the creation of additional habitat (sandbars) due to minor changes in stream morphology.	Yes
Red Knot (*Calidris canutus rufa*) - Threatened	
Habitat Requirements: Red knots are usually found along mudflats associated with reservoirs.	
Habitat Assessment	**Habitat Impacts?**
All Build Alternatives: No mudflats or reservoirs are known to occur within or adjacent to the project site.	No Effect
Red-cockaded Woodpecker (*Picoides borealis*) - Endangered	
Habitat Requirements: Red-cockaded woodpeckers require open pine woodlands and savannahs with large old pines for nesting and roosting habitat. Cavity trees must be in open stands with little or no hardwood midstory and few or no overstory hardwoods. Suitable foraging habitat, which must be in abundance, consists of mature pine with an open canopy, low densities of small pines, little or no hardwood or pine midstory, few or no overstory hardwoods, and abundant native bunchgrass and forb groundcovers.	
Habitat Assessment	**Habitat Impacts?**
Alternatives D, F, and G; Interchange Alts. 1, 1A, 2, and 3: No open pine woodlands meeting habitat requirements are anticipated within the impact footprint of these build alternatives.	No Effect
Alternatives A, B, and H: Pine woodlands are present within and adjacent to the impact footprint of these western bypass alternatives. These pine forests within the impact footprint would be cleared in order to construct the proposed roadways. Additionally, a population of the red-cockaded woodpecker has been documented at the Big Timber Leased Lands WMA Upland Wildlife Demonstration Area located 5 miles west of Gurdon. This WMA is located approximately 15 miles southwest of Arkadelphia and its presence increases the chances that the species is also utilizing habitat within the study area. Estimated acreages of impacted pine forest are as follows: • 9.7 acres for Alternatives A and B • 11.6 acres for Alternative H	Yes
Ouachita Rock Pocketbook (*Arkansia/Arcidens wheeleri*) - Endangered*	
Habitat Requirements: The Ouachita rock-pocketbook inhabits pools, backwaters, and side channels in the Little River and its larger tributaries in southeast Oklahoma and southwest Arkansas and Ouachita River in Arkansas. The species occupies stable substrates containing gravel, sand, and other materials.	
Habitat Assessment	**Habitat Impacts?**
Alternatives A, B, D, F, and H; Interchange Alts. 1, 1A, 2, and 3: No rivers or watercourses large enough to sustain mussel populations are anticipated within the impact footprint of these build alternatives.	No Effect

Job Number 070442

Alternative G: The Ouachita River is present within and adjacent to the impact footprint of Alternative G, which will construct a new bridge over the Ouachita River. ANHC documented the presence of Ouachita rock-pocketbook shells in 1983 within the Ouachita River, located approximately 1.7 miles downstream of the proposed bridge location. During construction of the bridge, some in-stream activity may be required, including installation of one or more piers. Although, proper erosion control best management practices will be utilized throughout the project construction to minimize sedimentation downstream, existing habitat may be impacted.	Yes
Pink Mucket (*Lampsilis abrupta*) - Endangered*	
Habitat Requirements: Pink muckets are found in mud and sand and in shallow riffles and shoals swept free of silt in major rivers and tributaries. This mussel buries itself in sand or gravel, with only the edge of its shell and its feeding siphons exposed.	
Habitat Assessment	**Habitat Impacts?**
Alternatives A, B, D, F, and H; Interchange Alts. 1, 1A, 2, and 3: No rivers or watercourses large enough to sustain mussel populations are anticipated within the impact footprint of these build alternatives.	No Effect
Alternative G: The Ouachita River is present within and adjacent to the impact footprint of Alternative G, which will construct a new bridge over the Ouachita River, and likely contains suitable habitat for this mussel species. ANHC documented the presence of pink mucket shells in 1983 within the Ouachita River, located approximately 1.7 miles and 2.2 miles downstream of the proposed bridge location. During construction of the bridge, some in-stream activity may be required, including installation of one or more piers. Although, proper erosion control best management practices will be utilized throughout the project construction to minimize sedimentation downstream, existing habitat may be impacted.	Yes
Rabbitsfoot (*Quadrula cylindrica cylindrica*) - Threatened*	
Habitat Requirements: Rabbitsfoot generally inhabit small- to medium-sized streams and some larger rivers. It occurs in shallow water areas along the bank and in shoals with reduced water velocity. Individuals have also been found in deep water runs (9-12 ft.). Bottom substrates generally include gravel and sand, but they have been found in riprap as well. In Arkansas, rabbitsfoot populations occur in the St. Francis River, White River, War Eagle Creek, Buffalo River, Black River, Current River, Spring River, South Fork Spring River, Strawberry River, Middle Fork Little Red River, Illinois River, Cossatot River, Ouachita River, Little Missouri River, and Saline River.	
Habitat Assessment	**Habitat Impacts?**
Alternatives A, B, D, F, and H; Interchange Alts. 1, 1A, 2, and 3: No rivers or watercourses large enough to sustain mussel populations are anticipated within the impact footprint of these build alternatives.	No Effect
Alternative G: The Ouachita River is present within and adjacent to the impact footprint of Alternative G, which will construct a new bridge over the Ouachita River. ANHC documented the presence of rabbitsfoot shells in 1983 within the Ouachita River, located approximately 0.3 mile upstream and 1.7 miles downstream of the proposed bridge location. During construction of the bridge, some in-stream activity may be required, including installation of one or more piers. Although, proper erosion control best management practices will be utilized throughout the project construction to minimize sedimentation downstream, existing habitat may be impacted.	Yes
Spectaclecase (*Cumberlandia monodonta*) - Endangered	
Habitat Requirements: Spectaclecase mussels are found in large rivers where they live in areas sheltered from the main force of the river current. This species often clusters in firm mud and in sheltered areas, such as beneath rock slabs, between boulders and even under tree roots.	

Job Number 070442

Habitat Assessment	Habitat Impacts?
Alternatives A, B, D, F, and H; Interchange Alts. 1, 1A, 2, and 3: No rivers or watercourses large enough to sustain mussel populations are anticipated within the impact footprint of these build alternatives.	No Effect
Alternative G: The Ouachita River is present within and adjacent to the impact footprint of Alternative G, which will construct a new bridge over the Ouachita River, and likely contains suitable habitat for this mussel species. Some in-stream activity may be required during construction of the bridge, including installation of one or more piers. Although, proper erosion control best management practices will be utilized throughout the project construction to minimize sedimentation downstream, existing habitat may be impacted.	Yes
Winged Mapleleaf (*Quadrula fragosa*) - Endangered	
Habitat Requirements: Winged mapleleaf are found in riffles with clean gravel, sand, or rubble bottoms and in clear, high quality water. In the past, it may also have been found in large rivers and streams on mud, mud-covered gravel, and gravel bottoms. The winged mapleleaf mussel is known from only five populations: the St. Croix River in MN and WI, the Saline and Ouachita Rivers in Arkansas, the Little River in OK, and the Bourbeuse River in MO.	
Habitat Assessment	**Habitat Impacts?**
Alternatives A, B, D, F, and H; Interchange Alts. 1, 1A, 2, and 3: No rivers or watercourses large enough to sustain mussel populations are anticipated within the impact footprint of these build alternatives.	No Effect
Alternative G: The Ouachita River is present within and adjacent to the impact footprint of Alternative G, which will construct a new bridge over the Ouachita River. Some in-stream activity may be required during construction of the bridge, including installation of one or more piers. Although, proper erosion control best management practices will be utilized throughout the project construction to minimize sedimentation downstream, existing habitat may be impacted.	Yes
American Burying Beetle (*Nicrophorus americanus*) - Endangered*	
Habitat Requirements: The American burying beetle (ABB) is a scavenger, dependent on carrion for food and reproduction. They are found in areas with native perennial vegetation and open woodlands and grasslands. Suitable habitat includes well-drained soils, a well-formed detritus layer at the ground surface, relatively level topography, and available carrion.	
Habitat Assessment	**Habitat Impacts?**
All Build Alternatives: Potentially suitable habitat (e.g., open woodlands and grasslands with native perennial vegetation) is present within the footprint of all build alternatives, including interchange alternatives. ANHC documented a known catch record of ABB in 2017 in the Big Timber WMA, located approximately 0.3-mile northwest of the eastern terminus of Alternative G. Clearing of native vegetation along the route of each build alternative will be required in order to construct the proposed roadway and/or interchange. Estimated acreages of native perennial upland vegetation to be cleared are as follows: • 31 acres for Alt. A • 36 acres for Alt. B • 134 acres for Alt. H • 3 acres for Alt. D • 27 acres for Alt. F • 36 acres for Alt. G • 2.6 acres for Interchange Alt. 1 • 1.5 acres for Interchange Alt. 1A • 3.4 acres for Interchange Alt. 2 • 3.3 acres for Interchange Alt. 3	Yes

*Also listed by ANHC as a species of Federal Concern.

Job Number 070442

Table 2: Habitat Assessment and Preliminary Impacts to Species of State Concern

American Eel (*Anguilla rostrata)*	
Habitat Requirements: The American Eel lives in freshwater as adults, usually in larger rivers or lakes.	
Habitat Assessment	**Habitat Impacts?**
Alternatives A, B, D, F, and H; Interchange Alts. 1, 1A, 2, and 3: No rivers or waterbodies large enough to sustain eel populations are anticipated within the impact footprint of these build alternatives.	No Effect
Alternative G: The Ouachita River is present within and adjacent to the impact footprint of Alternative G, which will construct a new bridge over the Ouachita River. ANHC documented the presence of the American Eel in 1975 and 1977 within the Ouachita River, located approximately 1.2 miles upstream of the proposed bridge location. During construction of the bridge, some in-stream activity may be required, including installation of one or more piers. Although, proper erosion control best management practices will be utilized throughout the project construction to minimize sedimentation downstream, existing habitat may be impacted.	Yes
Crystal Darter (*Crystallaria asprella*)	
Habitat Requirements: This darter inhabits clear to slightly turbid water of raceways and swift to moderately swift riffles of small to medium rivers with expanses of clean sand or gravel; it does not associate with mud, clay, or submerged vegetation (Pflieger 1997, Ross 2001, Boschung and Mayden 2004). Usually it occurs in water more than 60 centimeters deep with strong current. In Arkansas, this species was collected typically at depths of 114-148 centimeters and velocities of 46-90 centimeters per second; predominantly on gravel, small cobble, and patches of sand (George et al. 1996).	
Habitat Assessment	**Habitat Impacts?**
Alternatives A, B, D, F, and H; Interchange Alts. 1, 1A, 2, and 3: No rivers or waterbodies large enough to sustain Crystal Darter populations are anticipated within the impact footprint of these build alternatives.	No Effect
Alternative G: The Ouachita River is present within and adjacent to the impact footprint of Alternative G, which will construct a new bridge over the Ouachita River. ANHC documented the presence of the Crystal Darter in 1980 and 2012 within the Ouachita River, located approximately 0.5 miles upstream of the proposed bridge location. During construction of the bridge, some in-stream activity may be required, including installation of one or more piers. Although, proper erosion control best management practices will be utilized throughout the project construction to minimize sedimentation downstream, existing habitat may be impacted.	Yes
Ouachita Fanshell (*Cyprogenia sp. cf aberti*)	
Habitat Requirements: This species is found on rock, gravel, and soft mud bottoms in medium sized rivers in flowing water only.	
Habitat Assessment	**Habitat Impacts?**
Alternatives A, B, D, F, and H; Interchange Alts. 1, 1A, 2, and 3: No rivers or waterbodies large enough to sustain mussel populations are anticipated within the impact footprint of these build alternatives.	No Effect

Job Number 070442

Alternative G: The Ouachita River is present within and adjacent to the impact footprint of Alternative G, which will construct a new bridge over the Ouachita River. ANHC documented the presence of the Ouachita Fanshell in 1983 within the Ouachita River, located approximately 2.2 miles downstream of the proposed bridge location. During construction of the bridge, some in-stream activity may be required, including installation of one or more piers. Although, proper erosion control best management practices will be utilized throughout the project construction to minimize sedimentation downstream, existing habitat may be impacted.	Yes
Mooneye (*Hiodon tergisus*)	
Habitat Requirements: Mooneye habitat includes deep pools and backwaters of medium to large rivers and interconnecting lakes and reservoirs with clear water; often in nonflowing waters but feeds mostly in swift water. Spawning may occur upstream in large clear streams. Eggs are semibuoyant and drift downstream or into quiet water.	
Habitat Assessment	**Habitat Impacts?**
Alternatives A, B, D, F, and H; Interchange Alts. 1, 1A, 2, and 3: No rivers or waterbodies large enough to sustain Mooneye populations are anticipated within the impact footprint of these build alternatives.	No Effect
Alternative G: The Ouachita River is present within and adjacent to the impact footprint of Alternative G, which will construct a new bridge over the Ouachita River. ANHC documented the presence of the Mooneye in 1980 within the Ouachita River, located approximately 1.2 miles upstream of the proposed bridge location. During construction of the bridge, some in-stream activity may be required, including installation of one or more piers. Although, proper erosion control best management practices will be utilized throughout the project construction to minimize sedimentation downstream, existing habitat may be impacted.	Yes
Glossy Swampsnake (*Liodytes rigida*)	
Habitat Requirements: Glossy Swampsnake habitats include slow waters of lowland areas, such as swamps, nontidal and tidal freshwater marshes, sphagnum bogs, pocosins, seepage wetlands, ponds, lakes, flatwoods ponds, cypress ponds, bayous, rice fields, canals, drainage ditches, mucky areas along streams, and floodplains; also sometimes grassy or wooded upland habitats adjacent to wetlands (Ernst and Ernst 2003, Gibbons and Dorcas 2004).	
Habitat Assessment	**Habitat Impacts?**
Interchange Alt. 1, 1A, and 3: There are no known marshes/wetlands, ponds, or mucky areas along streams or floodplains within the impact footprint of these interchange aternatives.	No Effect
Alternatives A, B, F, G, and H; Interchange Alt. 2: ANHC documented the presence of the Glossy Swampsnake in 1976 near Hwy 8 on the east side of the Ouachita River in a rice field that is located approximately 1 mile southeast of the eastern end of Alternative G. While no rice fields are currently located in the footprints of these build alternatives, wetlands or marshes are present within the footprints of these build alternatives and may be suitable habitat for the Glossy Swampsnake. These wetlands would be cleared/filled in order to construct the proposed roadways and/or interchanges. Estimated acreages of impacted wetlands are as follows: • 25 acres for Alt. A • 23 acres for Alt. B • 20 acres for Alt. H • 7 acres for Alt. F • 9 acres for Alt. G • 0.2 acres for Interchange Alt. 2	Yes

Job Number 070442

Alternatives A, B, D, F, G, and H: In addition to wetland habitat, streams within the project area may contain sufficiently mucky areas to provide habitat for the Glossy Swampsnake. The numbers of stream crossings required for each alternative where Swampsnake habitat may be impacted are listed below. Some of these crossings were also identified to potentially contain wetlands and those wetland acreages are calculated above. These streams would be culverted/filled in order to construct the proposed roadways. • 5 crossings for Alt. A • 1 crossing for Alt. D • 3 crossings for Alt. B • 3 crossings for Alt. F • 13 crossings for Alt. H • 3 crossings for Alt. G	Potential
Striped Mullet (*Mugil cephalus*)	
Habitat Requirements: Striped Mullet are usually found in marine and estuarine habitats, often ascending coastal rivers for considerable distances. Juveniles and subadults occur in a variety of estuarine and freshwater habitats. Primarily in shallow estuaries. Spawns primarily in open sea, young gradually move back into estuaries. May spawn in rivers (Moyle 1976). Riverine habitats are typically low gradient medium and large rivers.	
Habitat Assessment	**Habitat Impacts?**
Alternatives A, B, D, F, and H; Interchange Alts. 1, 1A, 2, and 3: No rivers or waterbodies large enough to sustain Striped Mullet populations are anticipated within the impact footprint of these build alternatives.	No Effect
Alternative G: The Ouachita River is present within and adjacent to the impact footprint of Alternative G, which will construct a new bridge over the Ouachita River. ANHC documented the presence of the Striped Mullet in 1975 within the Ouachita River, located approximately 1.2 miles upstream of the proposed bridge location. During construction of the bridge, some in-stream activity may be required, including installation of one or more piers. Although, proper erosion control best management practices will be utilized throughout the project construction to minimize sedimentation downstream, existing habitat may be impacted.	Yes
Saddleback Darter (*Percina vigil*)	
Habitat Requirements: Saddleback Darters inhabit creeks and small to medium rivers in areas of moderate current over sand and gravel or gravel and rubble substrates, often at foot of chute or riffle or near snags or logjams; sometimes in very shallow water (Kuehne and Barbour 1983, Page and Burr 1991).	
Habitat Assessment	**Habitat Impacts?**
Alternatives A, B, D, F, and H; Interchange Alts. 1, 1A, 2, and 3: No rivers or waterbodies large enough to sustain the Saddleback Darter populations are anticipated within the impact footprint of these build alternatives.	No Effect
Alternative G: The Ouachita River is present within and adjacent to the impact footprint of Alternative G, which will construct a new bridge over the Ouachita River. ANHC documented the presence of the Saddleback Darter in 1976 within the Ouachita River, located approximately 1.2 miles upstream of the proposed bridge location. During construction of the bridge, some in-stream activity may be required, including installation of one or more piers. Although, proper erosion control best management practices will be utilized throughout the project construction to minimize sedimentation downstream, existing habitat may be impacted.	Yes
Round Pigtoe (*Pleurobema sintoxia*)	
Habitat Requirements: Round Pigtoes are found in medium to large rivers in mixed mud, sand, and gravel (Cummings and Mayer, 1992).	

Job Number 070442

Habitat Assessment	Habitat Impacts?
Alternatives A, B, D, F, and H; Interchange Alts. 1, 1A, 2, and 3: No rivers or watercourses large enough to sustain mussel populations are present within the impact footprint of these build alternatives.	No Effect
Alternative G: The Ouachita River is present within and adjacent to the impact footprint of Alternative G, which will construct a new bridge over the Ouachita River, and likely contains suitable habitat for this mussel species. ANHC documented the presence of Round Pigtoes in 1983 within the Ouachita River, located approximately 1.7 miles downstream of the proposed bridge location. During construction of the bridge, some in-stream activity may be required, including installation of one or more piers. Although, proper erosion control best management practices will be utilized throughout the project construction to minimize sedimentation downstream, existing habitat may be impacted.	Yes
Ouachita Kidneyshell (*Ptychobranchus occidentalis*)	
Habitat Requirements: Ouachita Kidneyshells are generally found in upland streams in silt, sand, gravel or rocky substrates in slow to moderate currents. It occurs in depths of water from 7.5 cm to ~1 meter (Buchanan, 1980).	
Habitat Assessment	**Habitat Impacts?**
Interchange Alts. 1, 1A, 2, and 3: No rivers or watercourses large enough to sustain mussel populations are present within the impact footprint of these build alternatives.	No Effect
Alternatives A, B, D, F, G, and H: Streams within the project area may contain sufficient aquatic habitat for this mussel species. These streams would be culverted/filled in order to construct the proposed roadways. The numbers of stream crossings required for each alternative where Ouachita Kidneyshell habitat may be impacted are listed below. • 5 crossings for Alt. A • 1 crossing for Alt. D • 3 crossings for Alt. B • 3 crossings for Alt. F • 13 crossings for Alt. H • 3 crossings for Alt. G	Potential
Alternative G: The Ouachita River is one of the 3 stream crossings required for Alternative G, which will construct a new bridge over the Ouachita River. ANHC documented the presence of the Ouachita Kidneyshell in 1983 within the Ouachita River, located approximately 2.3 miles downstream of the proposed bridge location. During construction of the bridge, some in-stream activity may be required, including installation of one or more piers. Although, proper erosion control best management practices will be utilized throughout the project construction to minimize sedimentation downstream, existing habitat may be impacted.	Yes
Texas Lilliput (*Toxolasma texasiense*)	
Habitat Requirements: This species is typically found in still waters often from feeder creeks, protected or ponded waters on mud or sand (Howells et al., 1996), but Cummings and Mayer (1992) described it from small to medium streams and sloughs in mud and sand under slow-flow conditions.	
Habitat Assessment	**Habitat Impacts?**
Interchange Alts. 1, 1A, 2, and 3: No rivers or watercourses large enough to sustain mussel populations are present within the impact footprint of these build alternatives.	No Effect
Alternatives A, B, D, F, G, and H: Streams within the project area may contain sufficient aquatic habitat for this mussel species. These streams would be culverted/filled in order to construct the proposed roadways. The numbers of stream crossings required for each alternative where Texas Lilliput habitat may be impacted are listed below. • 5 crossings for Alt. A • 1 crossing for Alt. D • 3 crossings for Alt. B • 3 crossings for Alt. F • 13 crossings for Alt. H • 3 crossings for Alt. G	Potential

Job Number 070442

Alternative G: The Ouachita River is one of the 3 stream crossings required for Alternative G, which will construct a new bridge over the Ouachita River. ANHC documented the presence of the Texas Lilliput in 1983 within the Ouachita River, located approximately 0.9 mile downstream of the proposed bridge location. During construction of the bridge, some in-stream activity may be required, including installation of one or more piers. Although, proper erosion control best management practices will be utilized throughout the project construction to minimize sedimentation downstream, existing habitat may be impacted.	Yes
Little Spectaclecase (*Villosa lienosa*)	
Habitat Requirements: Little Spectaclecase are reported in sandy substrates in slight to moderate current (Heard, 1979). This mussel typically inhabits small creeks to medium-sized rivers, usually along the banks in slower currents. Characteristic more so of smaller streams than not.	
Habitat Assessment	**Habitat Impacts?**
Interchange Alts. 1, 1A, 2, and 3: No rivers or watercourses large enough to sustain mussel populations are present within the impact footprint of these build alternatives.	No Effect
Alternatives A, B, D, F, G, and H: Streams within the project area may contain sufficient aquatic habitat for this mussel species. These streams would be culverted/filled in order to construct the proposed roadways. The numbers of stream crossings required for each alternative where Little Spectaclecase habitat may be impacted are listed below. • 5 crossings for Alt. A • 1 crossing for Alt. D • 3 crossings for Alt. B • 3 crossings for Alt. F • 13 crossings for Alt. H • 3 crossings for Alt. G	Potential
Alternative G: The Ouachita River is one of the 3 stream crossings required for Alternative G, which will construct a new bridge over the Ouachita River. ANHC documented the presence of the Little Spectaclecase in 1983 within the Ouachita River, located approximately 1.7 miles downstream of the proposed bridge location. During construction of the bridge, some in-stream activity may be required, including installation of one or more piers. Although, proper erosion control best management practices will be utilized throughout the project construction to minimize sedimentation downstream, existing habitat may be impacted.	Yes

References

Boschung, H. T., and R. L. Mayden. 2004. Fishes of Alabama. Smithsonian Institution Press, Washington, D.C. 960 pp.

Buchanan, A.C. 1980. Mussels (naiades) of the Meramec River Basin. Missouri Department of Conservation, Aquatic Series, 17: 1-68.

Cummings, K.S. and C.A. Mayer. 1992. Field Guide to Freshwater Mussels of the Midwest. Illinois Natural History Survey Manual 5, Illinois. 194 pp.

Ernst, C. H., and E. M. Ernst. 2003. Snakes of the United States and Canada. Smithsonian Books, Washington, D.C.

George, S. G., W. T. Slack, and N. H. Douglas. 1996. Demography, habitat, reproduction, and sexual dimorphism of the crystal darter, CRYSTALLARIA ASPRELLA (Jordan), from south-central Arkansas. Copeia 1996: 68-78.

Gibbons, J. W., and M. E. Dorcas. 2004. North American watersnakes: a natural history. University of Oklahoma Press, Norman. xxvi + 439 pp.

Howells, R.G., R.W. Neck, and H.D. Murray. 1996. Freshwater Mussels of Texas. Texas Parks and Wildlife Press: Austin, Texas. 218 pp.

Job Number 070442

Kuehne, R. A., and R. W. Barbour. 1983. The American Darters. University Press of Kentucky, Lexington, Kentucky. 177 pp.

Moyle, P. B. 1976a. Inland fishes of California. University of California Press, Berkeley, California. 405 pp.

NatureServe. 2020. NatureServe Explorer. Available Online at: https://explorer.natureserve.org.

Page, L. M., and B. M. Burr. 1991. A field guide to freshwater fishes: North America north of Mexico. Houghton Mifflin Company, Boston, Massachusetts. 432 pp.

Pflieger, W. L. 1997a. The fishes of Missouri. Revised edition. Missouri Department of Conservation, Jefferson City. vi + 372 pp.

Ross, S. T. (with W. M. Brennaman, W. T. Slack, M. T. O'Connell, and T. L. Peterson). 2001a. The Inland Fishes of Mississippi. University Press of Mississippi: Mississippi. xx + 624 pp.

U.S. Fish and Wildlife Service (USFWS). 2003. Recovery plan for the red-cockaded woodpecker (*Picoides borealis*): second revision. US Fish and Wildlife Service, Atlanta, GA. 296pp.

U.S. Fish and Wildlife Service (USFWS) Arkansas Ecological Services Field Office. 2015. Pink Mucket (*Lampsilis abrupta*). Available Online at: https://www.fws.gov/arkansas-es/Species/Mussels/pinkmucket.html.

U.S. Fish and Wildlife Service (USFWS) Arkansas Ecological Services Field Office. 2015. Rabbitsfoot (*Theliderma cylindrica*; listed originally as *Quadrula cylindrica cylindrica*). Available Online at: https://www.fws.gov/arkansas-es/Species/Mussels/rabbitsfoot.html.

U.S. Fish and Wildlife Service (USFWS) Midwest Region. 2019. Northern Long-Eared Bat (*Myotis septentrionalis*) Fact Sheet. Available Online at: https://www.fws.gov/Midwest/endangered/mammals/nleb/nlebFactSheet.html.

U.S. Fish and Wildlife Service (USFWS) Midwest Region. 2019. Piping Plover Fact Sheet Fact Sheet. Available Online at: https://www.fws.gov/midwest/endangered/birds/leasttern/lntLeastTernFactSheet.html.

U.S. Fish and Wildlife Service (USFWS) Midwest Region. 2019. Spectaclecase (a freshwater mussel) *Cumberlandia monodonta*. Available Online at: https://www.fws.gov/midwest/endangered/clams/spectaclecase/SpectaclecaseFactSheet.html.

U.S. Fish and Wildlife Service (USFWS) Midwest Region. 2019. Winged Mapleleaf (*Quadrula fragosa*) Fact Sheet. Available Online at: https://www.fws.gov/midwest/endangered/clams/wima/winge_fc.html.

Attachments

IPaC Official Species List
ANHC Correspondence

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Arkansas Ecological Services Field Office
110 South Amity Suite 300
Conway, AR 72032-8975
Phone: (501) 513-4470 Fax: (501) 513-4480
http://www.fws.gov/arkansas-es

In Reply Refer To: January 21, 2020
Consultation Code: 04ER1000-2018-SLI-0922
Event Code: 04ER1000-2020-E-00944
Project Name: Arkadelphia Bypass

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies endangered, threatened, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). **This letter only provides an official species list and technical assistance; if you determine that listed species and/or designated critical habitat may be affected in any way by the proposed project, even if the effect is wholly beneficial, consultation with the Service will be necessary.**

If you determine that this project will have no effect on listed species and their habitat in any way, then you have completed Section 7 consultation with the Service and may use this letter in your project file or application.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found on our website.

Please visit our website at http://www.fws.gov/arkansas-es/IPaC/home.html for species-specific guidance to avoid and minimize adverse effects to federally endangered,

threatened, proposed, and candidate species. Our web site also contains additional information on species life history and habitat requirements that may be useful in project planning.

If your project involves in-stream construction activities, oil and natural gas infrastructure, road construction, transmission lines, or communication towers, please review our project specific guidance at http://www.fws.gov/arkansas-es/IPaC/ProjSpec.html.

The karst region of Arkansas is a unique region that covers the **northern third of Arkansas** and we have specific guidance to conserve sensitive cave-obligate and bat species. **Please visit http://www.fws.gov/arkansas-es/IPaC/Karst.html to determine if your project occurs in the karst region and to view karst specific-guidance.** Proper implementation and maintenance of best management practices specified in these guidance documents is necessary to avoid adverse effects to federally protected species and often avoids the more lengthy formal consultation process.

If your species list includes any mussels, Northern Long-eared Bat, Indiana Bat, Yellowcheek Darter, Red-cockaded Woodpecker, or American Burying Beetle, your project may require a presence/absence and/or habitat survey prior to commencing project activities. Please check the appropriate species-specific guidance on our website to determine if your project requires a survey. We strongly recommend that you contact the appropriate staff species lead biologist (see office directory or species page) prior to conducting presence/absence surveys to ensure the appropriate level of effort and methodology.

Under the ESA, it is the responsibility of the Federal action agency or its designated representative to determine if a proposed action "may affect" endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with the Service further. Similarly, it is the responsibility of the Federal action agency or project proponent, not the Service, to make “no effect” determinations. If you determine that your proposed action will have “no effect” on threatened or endangered species or their respective critical habitat, you do not need to seek concurrence with the Service. Nevertheless, it is a violation of Federal law to harm or harass any federally-listed threatened or endangered fish or wildlife species without the appropriate permit.

Through the consultation process, we will analyze information contained in a biological assessment that you provide. If your proposed action is associated with Federal funding or permitting, consultation will occur with the Federal agency under section 7(a)(2) of the ESA. Otherwise, an incidental take permit pursuant to section 10(a)(1)(B) of the ESA (also known as a habitat conservation plan) is necessary to harm or harass federally listed threatened or endangered fish or wildlife species. In either case, there is no mechanism for authorizing incidental take “after-the-fact.” For more information regarding formal consultation and HCPs, please see the Service's Consultation Handbook and Habitat Conservation Plans at www.fws.gov/endangered/esa-library/index.html#consultations.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to

federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, **the accuracy of this species list should be verified after 90 days.** This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. **Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.**

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Arkansas Ecological Services Field Office
110 South Amity Suite 300
Conway, AR 72032-8975
(501) 513-4470

Project Summary

Consultation Code: 04ER1000-2018-SLI-0922

Event Code: 04ER1000-2020-E-00944

Project Name: Arkadelphia Bypass

Project Type: TRANSPORTATION

Project Description: The Arkansas Department of Transportation (ARDOT) is conducting an environmental and location study and preparing environmental documentation for a proposed road improvements project to help alleviate traffic and improve safety through Arkadelphia's Central Business District in Clark County, Arkansas.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/34.11406607500004N93.0453967459045W

Counties: Clark, AR

Endangered Species Act Species

There is a total of 11 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Eastern Black Rail *Laterallus jamaicensis ssp. jamaicensis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10477	Proposed Threatened
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot *Calidris canutus rufa* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened
Red-cockaded Woodpecker *Picoides borealis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7614	Endangered

Clams

NAME	STATUS
Ouachita Rock Pocketbook *Arkansia wheeleri* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4509	Endangered
Pink Mucket (pearlymussel) *Lampsilis abrupta* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7829	Endangered
Rabbitsfoot *Quadrula cylindrica cylindrica* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5165	Threatened
Spectaclecase (mussel) *Cumberlandia monodonta* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7867	Endangered
Winged Mapleleaf *Quadrula fragosa* Population: Wherever found, except where listed as an experimental population No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4127	Endangered

Insects

NAME	STATUS
American Burying Beetle *Nicrophorus americanus*	Endangered

Population: Wherever found, except where listed as an experimental population
No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/66

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

THE DEPARTMENT OF ARKANSAS HERITAGE

Asa Hutchinson
Governor

Stacy Hurst
Director

Arkansas Arts Council
•
Arkansas Historic Preservation Program
•
Arkansas State Archives
•
Delta Cultural Center
•
Historic Arkansas Museum
•
Mosaic Templars Cultural Center
•
Old State House Museum

ARKANSAS NATURAL HERITAGE COMMISSION

1100 North Street
Little Rock, AR 72201

(501) 324-9619
fax: (501) 324-9618
tdd: 711

e-mail:
info@naturalheritage.com
website:
www.naturalheritage.com

An Equal Opportunity Employer

Date: June 12, 2018
Subject: Arkadelphia Bypass from Hwy. 67 to Hwy. 51/8
Arkadelphia, Clark County, Arkansas
ANHC No.: P-CF..-18-053

Mr. Bill McAbee
Garver, LLC
4701 Northshore Drive
North Little Rock, AR 72118

Dear Mr. McAbee:

Staff members of the Arkansas Natural Heritage Commission have reviewed our files for records indicating the occurrence of rare plants and animals, outstanding natural communities, natural or scenic rivers, or other elements of special concern within or near the study area for the Arkadelphia Bypass project from Highway 67 to Highway 51/8. The results of this review are provided as a Geographic Information System (GIS) layer file. Documentation is provided to help you interpret the information in this file.

Our records indicate the potential occurrence of the following species within or near (a one-mile radius of) the project area:

Anguilla rostrata, American eel - State Concern
Arcidens wheeleri, Ouachita Rock Pocketbook - Federal Concern (endangered)
Crystallaria asprella, crystal darter - State Concern
Cyprogenia sp. cf aberti, Ouachita Fanshell - State Concern
Hiodon tergisus, mooneye - State Concern
Lampsilis abrupta, Pink Mucket - Federal Concern (endangered)
Liodytes rigida, Glossy Swampsnake - State Concern
Mugil cephalus, striped mullet - State Concern
Nicrophorus americanus, American burying beetle - Federal Concern (endangered)
Percina vigil, saddleback darter - State Concern
Pleurobema sintoxia, Round Pigtoe - State Concern
Ptychobranchus occidentalis, Ouachita Kidneyshell - State Concern
Theliderma cylindrica, Rabbitsfoot - Federal Concern (threatened)
Toxolasma texasiense, Texas Lilliput - State Concern
Villosa lienosa, little spectaclecase - State Concern

Most of these species were reported from the Ouachita River. Many of these records are older observations. We do not know the current status of these species in this reach of the river. It is of note, that four of the above

species are of federal concern. Coordination with the U.S. Fish and Wildlife Service would be appropriate.

A Clark County Element list is enclosed for your reference. Represented on this list are elements for which we have records in our database. The list has been annotated to indicate those elements known to occur within a one and a five-mile radius of the project site. A legend is enclosed to help you interpret the codes used on this list.

Please keep in mind that the project area may contain important natural features of which we are unaware. Staff members of the Arkansas Natural Heritage Commission have not conducted a field survey of the study site. Our review is based on data available to the program at the time of the request. It should not be regarded as a final statement on the elements or areas under consideration. Because our files are updated constantly, you may want to check with us again at a later time.

Thank you for consulting us. It has been a pleasure to work with you on this study.

Sincerely,

Cindy Osborne

Cindy Osborne
Data Manager/Environmental Review Coordinator

Enclosures: GIS Layer file (ANHCDATA)
Clark County Element List (annotated)
Legend
Invoice

6/12/2018

Arkansas Natural Heritage Commission
Department of Arkansas Heritage
Elements of Special Concern
Clark County

	Scientific Name	Common Name	Federal Status	State Status	Global Rank	State Rank
	Animals-Invertebrates					
✓	*Alasmidonta marginata*	Elktoe	-	INV	G4	S3
	Amblyscirtes belli	Bell's Roadside-Skipper	-	INV	G3G4	S3S4
✓*	*Arcidens wheeleri*	Ouachita Rock Pocketbook	LE	SE	G1	S1
	Atrytonopsis hianna	Dusted Skipper	-	INV	G4G5	S2S3
	Beameria venosa	A concealed-tymbal Cicada	-	INV	GNR	S1S2
	Chlosyne gorgone	Gorgone Checkerspot	-	INV	G5	S3
✓	*Cumberlandia monodonta*	Spectaclecase	LE	SE	G3	S2
✓*	*Cyprogenia sp. cf aberti*	Ouachita Fanshell	-	INV	GNR	S3
	Euphyes dukesi	Dukes' Skipper	-	INV	G3	S1S2
	Fallicambarus jeanae	Daisie burrowing crayfish	-	INV	G2	S2
	Faxonius menae	Mena crayfish	-	INV	G3	S3
✓*	*Lampsilis abrupta*	Pink Mucket	LE	SE	G2	S2
✓	*Lampsilis ornata*	Southern Pocketbook	-	INV	G5	S2
✓	*Lampsilis powellii*	Arkansas Fatmucket	LT	SE	G2	S2
	Lethe creola	Creole Pearly-Eye	-	INV	G3G4	S3
	Microstylum morosum	giant prairie robber fly	-	INV	G3G4	S1
✓*	*Nicrophorus americanus*	American burying beetle	LE	SE	G2G3	S1
✓	*Obovaria olivaria*	Hickorynut	-	INV	G4	S3
✓	*Pleurobema rubrum*	Pyramid Pigtoe	-	INV	G2G3	S2
✓*	*Pleurobema sintoxia*	Round Pigtoe	-	INV	G4G5	S3
	Poanes yehl	Yehl Skipper	-	INV	G4	S1S3
	Problema byssus	Byssus Skipper	-	INV	G3G4	S3
✓	*Procambarus parasimulans*	Bismark burrowing crayfish	-	INV	G4	S3
✓*	*Ptychobranchus occidentalis*	Ouachita Kidneyshell	-	INV	G3G4	S3
	Quadrula fragosa	Winged Mapleleaf	LE	SE	G1	S1
	Quadrula nobilis	Gulf Mapleleaf	-	INV	G4	S3
✓*	*Somatogyrus amnicoloides*	Ouachita pebblesnail	-	INV	GX	SX
✓*	*Somatogyrus wheeleri*	channelled pebblesnail	-	INV	GX	SX
	Speyeria diana	Diana Fritillary	-	INV	G3G4	S2S3
	Tetraloniella albata	white long-horned bee	-	INV	GNR	S1
✓*	*Theliderma cylindrica*	Rabbitsfoot	LT	SE	G3G4	S3
	Toxolasma lividum	Purple Lilliput	-	INV	G3Q	S3
	Toxolasma parvum	Lilliput	-	INV	G5	S3
✓*	*Toxolasma texasiense*	Texas Lilliput	-	INV	G4	S3
✓*	*Villosa lienosa*	little spectaclecase	-	INV	G5	S3
	Animals-Vertebrates					
✓	*Alosa alabamae*	Alabama shad	-	INV	G2G3	S1
✓	*Ambystoma talpoideum*	Mole Salamander	-	INV	G5	S3
✓*	*Anguilla rostrata*	American eel	-	INV	G4	S3
✓	*Carphophis amoenus*	Common Wormsnake	-	INV	G5	S2
✓	*Corynorhinus rafinesquii*	Rafinesque's big-eared bat	-	INV	G3G4	S3
✓*	*Crystallaria asprella*	crystal darter	-	INV	G3	S2

Clark Co. (cont.)

	Scientific Name	Common Name	Federal Status	State Status	Global Rank	State Rank
	Erimyzon sucetta	lake chubsucker	-	INV	G5	S3
	Etheostoma clinton	beaded darter	-	INV	GNR	S2
✓	*Etheostoma parvipinne*	goldstripe darter	-	INV	G4G5	S3
	Eurycea paludicola	Western Dwarf Salamander	-	INV	GNR	S3
	Haliaeetus leucocephalus	Bald Eagle	-	INV	G5	S3B,S4N
	Hemidactylium scutatum	Four-toed Salamander	-	INV	G5	S2
✓	*Hiodon alosoides*	goldeye	-	INV	G5	S2
*	*Hiodon tergisus*	mooneye	-	INV	G5	S2
✓	*Hyla avivoca*	Bird-voiced Treefrog	-	INV	G5	S3
✓	*Lethenteron appendix*	American brook lamprey	-	INV	G4	S3
✓*	*Liodytes rigida*	Glossy Swampsnake	-	INV	G5	S3
✓*	*Mugil cephalus*	striped mullet	-	INV	G5	S2
	Myotis austroriparius	southeastern bat	-	INV	G4	S3
	Myotis septentrionalis	northern long-eared bat	LT	SE	G1G2	S1S2
	Notropis ortenburgeri	Kiamichi shiner	-	INV	G3	S3
✓	*Notropis perpallidus*	peppered shiner	-	INV	G3	S3
✓	*Noturus taylori*	Caddo madtom	-	INV	G1	S1
	Ophisaurus attenuatus	Slender Glass Lizard	-	INV	G5	S3
✓	*Percina brucethompsoni*	Ouachita darter	-	INV	G2?	S2
✓	*Percina uranidea*	stargazing darter	-	INV	G3	S2
✓*	*Percina vigil*	saddleback darter	-	INV	G5	S3
	Picoides borealis	Red-cockaded Woodpecker	LE	SE	G3	S1
✓	*Polyodon spathula*	paddlefish	-	INV	G4	S3
✓	*Porphyrio martinicus*	Purple Gallinule	-	INV	G5	S1B
✓	*Pteronotropis hubbsi*	bluehead shiner	-	INV	G3	S3
	Plants-Vascular					
	Agalinis auriculata	ear-leaf false foxglove	-	INV	G3	S1
✓	*Amsonia hubrichtii*	Ouachita bluestar	-	INV	G3	S3
	Astragalus crassicarpus var.	purple ground-plum	-	INV	G5T5	S2
	Carex decomposita	cypress-knee sedge	-	INV	G3G4	S2
	Cirsium engelmannii	Engelmann's thistle	-	INV	G4	S1
	Cypripedium kentuckiense	Kentucky lady’s-slipper	-	INV	G3	S3
	Diaperia prolifera var. prolifera	big-head rabbit-tobacco	-	INV	G5TNR	S1S3
✓	*Fuirena simplex var. aristulata*	western umbrella sedge	-	INV	G5T4	S1
	Glandularia bipinnatifida var. bipinnatifida	Dakota vervain	-	INV	G5T5	S2
	Liatris squarrosa var. squarrosa	hairy scaly blazing-star	-	INV	G5T5	S1
	Lithospermum incisum	fringed puccoon	-	INV	G5	S2S3
	Lithospermum tuberosum	tuberous puccoon	-	INV	G4	S2
✓	*Lycopodiella prostrata*	prostrate bog club-moss	-	INV	G5	S1
	Minuartia drummondii	Drummond’s sandwort	-	INV	G5	S2S3
	Nemastylis geminiflora	celestial-lily	-	INV	G4	S3
	Physaria gracilis ssp. gracilis	slender bladderpod	-	INV	G5T4	S1
	Plantago rhodosperma	red-seed plantain	-	INV	GNR	S1S2
✓	*Pseudolycopodiella caroliniana*	slender bog club-moss	-	INV	G4	S1
	Psilotum nudum	whisk fern	-	INV	G5	S1?
	Pyrrhopappus pauciflorus	few-flower false dandelion	-	INV	G5	S1S2
	Ranunculus flabellaris	yellow water crowfoot	-	INV	G5	S3

Clark Co. (cont.)

Scientific Name	Common Name	Federal Status	State Status	Global Rank	State Rank
Scleria verticillata	whorled nut-rush	-	ST	G5	S1
Solidago tortifolia	twist-leaf goldenrod	-	INV	G4G5	S2
Spiranthes magnicamporum	Great Plains ladies'-tresses	-	INV	G3G4	S1S2
Spiranthes odorata	fragrant ladies'-tresses	-	INV	G5	S1
Spiranthes ovalis var. erostellata	northern oval ladies'-tresses	-	INV	G5?T4?	S1
Spiranthes praecox	giant ladies'-tresses	-	INV	G5	S1S2
Stenosiphon linifolius	false gaura	-	ST	G5	S1
Trichomanes petersii	dwarf bristle fern	-	ST	G4G5	S2
Utricularia inflata	swollen bladderwort	-	INV	G5	S1
Vernonia lettermannii	Letterman's ironweed	-	INV	G3	S3
Viola walteri	Walter's violet	-	INV	G4G5	S1S2
Xyris difformis var. difformis	bog yellow-eyed-grass	-	INV	G5T5	S2
Special Elements-Natural Communities					
Juniper-Hardwood Woodland		-	INV	GNR	S4
Lowland Pine-Oak Forest		-	INV	GNR	S1
South Central Saline Glade		-	INV	GNR	SNR
West Gulf Coastal Plain Northern Calcareous Prairie		-	INV	GNR	SNR
Special Elements-Other					
Colonial nesting site, water birds		-	INV	GNR	SNR

* - These elements have been recorded within a one-mile radius of the Arkadelphia Bypass study area

✓ - These elements have been recorded within a five-mile radius of the Arkadelphia Bypass study area

LEGEND

STATUS CODES

FEDERAL STATUS CODES

C = Candidate species. The U.S. Fish and Wildlife Service has enough scientific information to warrant proposing this species for listing as endangered or threatened under the Endangered Species Act.

LE = Listed Endangered; the U.S. Fish and Wildlife Service has listed this species as endangered under the Endangered Species Act.

LT = Listed Threatened; the U.S. Fish and Wildlife Service has listed this species as threatened under the Endangered Species Act.

-PD = Proposed for Delisting; the U.S. Fish and Wildlife Service has proposed that this species be removed from the list of Endangered or Threatened Species.

PE = Proposed Endangered; the U.S. Fish and Wildlife Service has proposed this species for listing as endangered.

PT = Proposed Threatened; the U.S. Fish and Wildlife Service has proposed this species for listing as threatened.

T/SA = Threatened (or Endangered) because of similarity of appearance.
E/SA

STATE STATUS CODES

INV = Inventory Element; The Arkansas Natural Heritage Commission is currently conducting active inventory work on these elements. Available data suggests these elements are of conservation concern. These elements may include outstanding examples of Natural Communities, colonial bird nesting sites, outstanding scenic and geologic features as well as plants and animals, which, according to current information, may be rare, peripheral, or of an undetermined status in the state. The ANHC is gathering detailed location information on these elements.

WAT = Watch List Species; The Arkansas Natural Heritage Commission is not conducting active inventory work on these species, however, available information suggests they may be of conservation concern. The ANHC is gathering general information on status and trends of these elements. An "*" indicates the status of the species will be changed to "INV" if the species is verified as occurring in the state (this typically means the agency has received a verified breeding record for the species).

MON = Monitored Species; The Arkansas Natural Heritage Commission is currently monitoring information on these species. These species do not have conservation concerns at present. They may be new species to the state, or species on which additional information is needed. The ANHC is gathering detailed location information on these elememts

SE = State Endangered; this term is applied differently for plants and animals.

Animals – These species are afforded protection under Arkansas Game and Fish Commission (AGFC) Regulation. The AGFC states that it is unlawful to import, transport, sell, purchase, hunt, harass or possess any threatened or endangered species of wildlife or parts. The AGFC lists as endangered any wildlife species or subspecies endangered or threatened with extinction, listed or proposed as a candidate for listing by the U.S. Fish and Wildlife Service or any native species or subspecies listed as endangered by the Commission.

Plants – These species have been recognized by the Arkansas Natural Heritage Commission as being in danger of being extirpated from the state. This is an administrative designation with no regulatory authority.

ST = State Threatened; These species have been recognized by the Arkansas Natural Heritage Commission as being likely to become endangered in Arkansas in the foreseeable future, based on current inventory information. This is an administrative designation with no regulatory authority.

DEFINITION OF RANKS

Global Ranks

G1 = Critically imperiled globally. At a very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.

G2 = Imperiled globally. At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.

G3 = Vulnerable globally. At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.

G4 = Apparently secure globally. Uncommon but not rare; some cause for long-term concern due to declines or other factors.

G5 = Secure globally. Common, widespread and abundant.

GH = Of historical occurrence, possibly extinct globally. Missing; known from only historical occurrences, but still some hope of rediscovery.

GU = Unrankable. Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

GX = Presumed extinct globally. Not located despite intensive searches and virtually no likelihood of rediscovery.

GNR = Unranked. The global rank not yet assessed.

GNA = Not Applicable. A conservation status rank is not applicable.

T-RANKS= T subranks are given to global ranks when a subspecies, variety, or race is considered at the state level. The subrank is made up of a "T" plus a number or letter (1, 2, 3, 4, 5, H, U, X) with the same ranking rules as a full species.

State Ranks

S1 = Critically imperiled in the state due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors making it vulnerable to extirpation.

S2 = Imperiled in the state due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it vulnerable to extirpation.

S3 = Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

S4 = Apparently secure in the state. Uncommon but not rare; some cause for long-term concern due to declines or other factors.

S5 = Secure in the state. Common, widespread and abundant.

SH = Of historical occurrence, with some possibility of rediscovery. Its presence may not have been verified in the past 20-40 years. A species may be assigned this rank without the 20-40 year delay if the only known occurrences were destroyed or if it had been extensively and unsuccessfully sought.

SU = Unrankable. Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

SX = Presumed extirpated from the state. Not located despite intensive searches and virtually no likelihood of rediscovery.

SNR = Unranked. The state rank not yet assessed.

SNA = Not Applicable. A conservation status rank is not applicable.

General Ranking Notes

Q = A "Q" in the global rank indicates the element's taxonomic classification as a species is a matter of conjecture among scientists.

RANGES= Ranges are used to indicate a range of uncertainty about the status of the element.

? = A question mark is used to denote an inexact numeric rank.

B = Refers to the breeding population of a species in the state.

N = Refers to the non-breeding population of a species in the state.

Appendix J – Cumulative and Indirect Impacts

Other Actions – Past, Present, and Reasonably Foreseeable – and their Effect on Each Resource

Telephone interviews with the City of Arkadelphia and with Clark County planners were conducted in an attempt to identified recent past, present, and reasonably foreseeable residential and mixed-use development projects in the next 20 years within their respective jurisdictions. Additionally, the 2019-2022 Statewide Transportation Improvement Plan (STIP) was utilized to identify additional "other actions", which are listed below in the table.

Impacts to aquatic features and wildlife habitat was estimated for each project. Impacts to streams and wetlands were calculated using USFWS National Wetlands Inventory (NWI) data within the Resource Study Area (RSA), which was identified as the HUC12 watershed for the project area. These numbers are likely lower than the actual acreages of wetlands present. Wildlife habitat impacts were calculated using 2016 (most recent year available) data from the National Land Cover Database (NLCD) for the RSA. These numbers are likely higher than the actual habitat present given the data is four years old and only intended to be approximations.

Project	Route	FFY	Estimated Impacts to Aquatic Features and Wildlife Habitat
System Preservation along 1 mile of I-30 from Caddo River to Caddo Valley	I-30	2022	Negligible due to scope of work.
Project Development along 12.3 miles of I-30 from Gurdon Rest Area to Hwy 26	I-30	2022	None due to scope of work.
Major Widening of 1.4 miles of Hwy 51/Pine St. from 26th St. to Hwy 67 in Arkadelphia	Hwy 51	2021	None due to surrounding urban environment.
Improve Structures and Approaches on Hwy 51 over Saline Bayou in Arkadelphia (east of Ouachita River)	Hwy 51	2022	Impacts up to 3.5 ac of woodlands, 0.5 ac of open habitat, 0.2 ac of ponded wetland, and 500 LF stream.
Development of 350 Residential Lots in a New Subdivision in Arkadelphia	WP Malone Rd	Unknown	Impacts up to 10 ac of woodlands.
Development of an Estimated 30 ac (with restaurants, retail, and hospitality) along I-30 and Red Hill Rd in Arkadelphia	Red Hill Rd	Unknown	Impacts up to 21 ac of woodlands.

Project	Route	FFY	Estimated Impacts to Aquatic Features and Wildlife Habitat
Bridge Number 01412, Ouachita River Structures and Approaches on Hwy 51 in Arkadelphia (new bridge over the Ouachita River)	Hwy 51	Constructed in 2018	Permanently impacted approx. 1.1 acres of wetlands and 260 LF ephemeral stream. No T&E species impacted.

Attachments

Indirect and Cumulative Impacts Questionnaire & Response

Indirect and Cumulative Impacts Questionnaire

Arkadelphia Bypass - Hwy 67 - Hwy 51 (ARDOT Job 070442)
Clark County, Arkansas

Respondent Information

Date: March 26, 2020

Name: Gary Brinkley / DeAnna Graves

Organization/Title: City of Arkadelphia - City Manager / Building Dept. Manager

Address: 700 Clay Street Arkadelphia, AR 71923

Phone and Email: 870-246-1818 deanna.graves@arkadelphia.gov

Questions & Discussion Topics

1) What are the new major developments in your jurisdiction or planning area? Work along I-30 & Red Hill Road;
   350 lot residential development West of W. P. Malone and North of the High School.

2) In your opinion, would the proposed project induce development in your area that would otherwise not occur? Yes, especially on our southern & western boundaries.

3) In your opinion, would any redevelopment occur as a result of the proposed project? If so, where? No, as the preponderance of the area reflected are undeveloped.

4) In your opinion, would the proposed project prohibit development in your jurisdiction or planning area and if so, why? Not, as proposed. The area around the airport would be excluded from development per FAA air space protection zone.

5) In your opinion, would the proposed project affect or change the type of development within your jurisdiction and if so, why? It would not.

6) Any additional developments in the future (out to 20-30 years) that are *reasonably foreseeable*? Additional housing on the West side of town is anticipated.

7) What future development would you expect independent of the proposed project? Additional restaurants, retail and hospitality growth along the I-30 corridor.

8) In your opinion, would the proposed project affect the rate and intensity of these developments discussed from the previous question? Please rate on a scale of 1 (no influence) to 5 (strong influence). Absolutely. #5 on the scale denoted.

Schmidt, Cassie P.

From: DeAnna Graves <deanna.graves@arkadelphia.gov>
Sent: Tuesday, April 7, 2020 8:06 AM
To: Schmidt, Cassie P.
Subject: RE: Arkadelphia Bypass - Indirect and Cumulative Effects

No there is some development that will happen but the bypass would greatly increase the development. Sorry for the confusion. #2 and #3 would definitely be a directly impacted by the bypass.

DeAnna Graves // Building Dept. Manager
700 Clay Street **//** Arkadelphia, AR 71923
(870)246-1818 **//** deanna.graves@arkadelphia.gov

Arkadelphia
ARKANSAS

From: Schmidt, Cassie P. [mailto:CPSchmidt@GarverUSA.com]
Sent: Monday, April 06, 2020 5:02 PM
To: DeAnna Graves <deanna.graves@arkadelphia.gov>
Subject: RE: Arkadelphia Bypass - Indirect and Cumulative Effects

Wonderful! Thank you DeAnna, this is very helpful! Can I clarify Area #1 with you….
In your questionnaire, I though you had indicated that you believed development along Red Hill Rd/I-30 would happen independent of the proposed project. Is that still true or are you saying Area #1 will only be developed if the Bypass is constructed?

Thanks again for your time!

Cassie Schmidt
Garver
479-287-4673

From: DeAnna Graves <deanna.graves@arkadelphia.gov>
Sent: Monday, April 6, 2020 4:40 PM
To: Schmidt, Cassie P. <CPSchmidt@GarverUSA.com>
Subject: RE: Arkadelphia Bypass - Indirect and Cumulative Effects

Cassie,
Sorry for not responding sooner to your request. I was out of the office Thursday and Friday. Please find attached the map with the areas marked that we expect to be developed as a direct result of the proposed project.

If I can be of further assistance, please do not hesitate to contact my office.

Thank you and have a nice evening,

DeAnna Graves // Building Dept. Manager
700 Clay Street // Arkadelphia, AR 71923
(870)246-1818 // deanna.graves@arkadelphia.gov

Arkadelphia
ARKANSAS

From: Schmidt, Cassie P. [mailto:CPSchmidt@GarverUSA.com]
Sent: Thursday, March 26, 2020 3:09 PM
To: DeAnna Graves <deanna.graves@arkadelphia.gov>
Subject: RE: Arkadelphia Bypass - Indirect and Cumulative Effects

Thank you so much, DeAnna!
Would you be able to estimate the amount of area you expect to be developed as a direct result of the proposed project (regarding question #2)? Or if it's easier, could you sketch out or highlight those areas on a map.

Thank you for your time!!

Cassie Schmidt
Garver
479-287-4673

From: DeAnna Graves <deanna.graves@arkadelphia.gov>
Sent: Thursday, March 26, 2020 3:04 PM
To: Schmidt, Cassie P. <CPSchmidt@GarverUSA.com>
Subject: RE: Arkadelphia Bypass - Indirect and Cumulative Effects

Cassie,

I have spoken with the City Manager and have completed the questionnaire.
If you need further assistance, please do not hesitate to contact our office.

Have a great day and stay safe!

Sincerely,

DeAnna Graves
City of Arkadelphia
Building Department
870-246-1818
deanna.graves@arkadelphia.gov

From: Schmidt, Cassie P. [mailto:CPSchmidt@GarverUSA.com]
Sent: Wednesday, March 25, 2020 2:34 PM

To: DeAnna Graves <deanna.graves@arkadelphia.gov>
Subject: Arkadelphia Bypass - Indirect and Cumulative Effects

Hi Deana,

Thank you for speaking over the phone with me just now. As I mentioned, I'm working on the environmental document being prepared for the Arkadelphia Bypass project and I have a few questions regarding foreseeable developments in your planning area. First, the various alternatives considered for the project are shown in the attached PDF.

Please fill out the attached questionnaire and return to me at your earliest convenience (within a week would be wonderful!). I have attached both a PDF and a word document of the questions; feel free to use which ever format makes your life easiest.

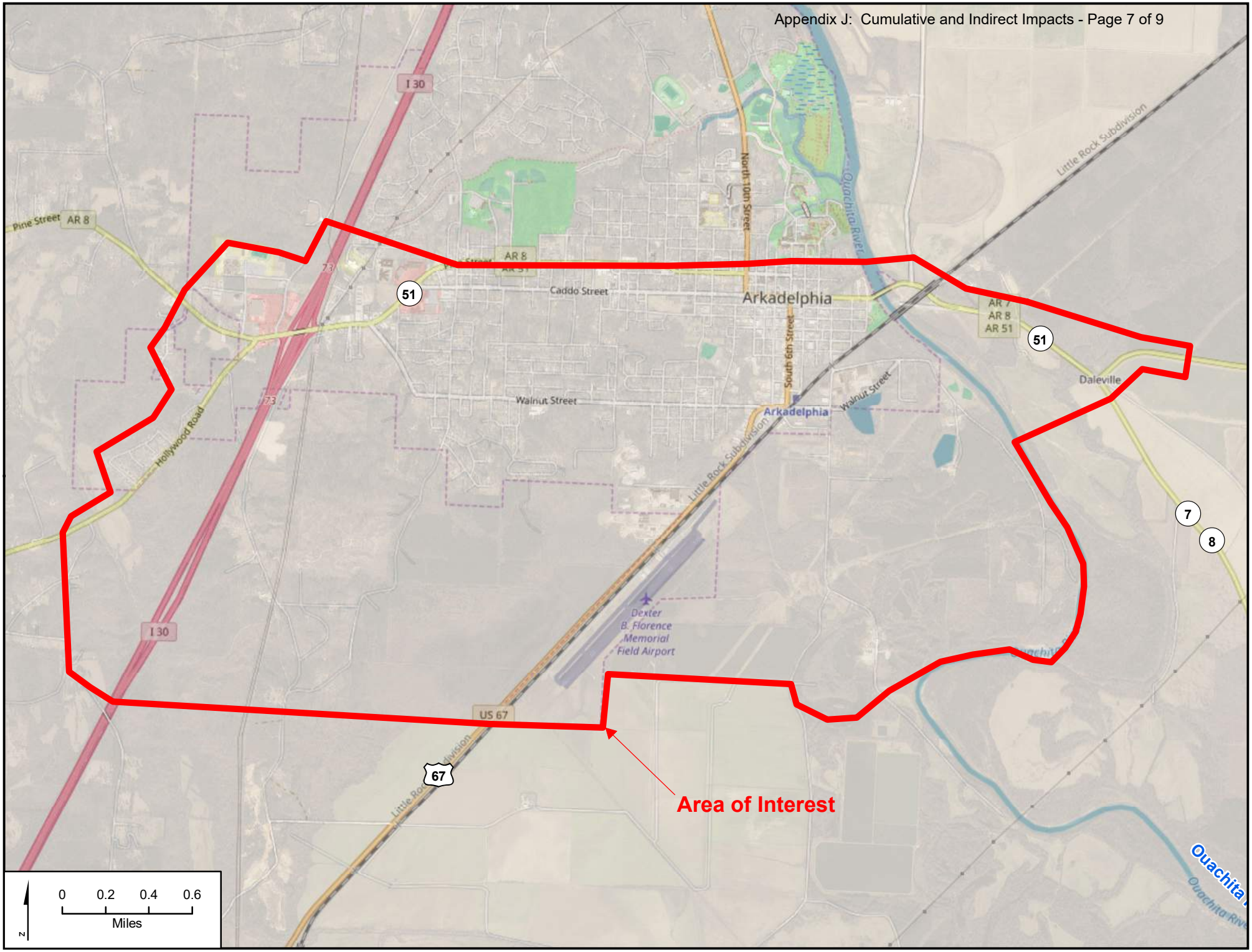
Ultimately, the primary information I need to know is if you know of any large, "*reasonably foreseeable*" (see definition in attached questionnaire) developments occurring within Arkadelphia within the next 20 years. Please feel free to mark those future developments on a map or send me information about their location and size. Additionally, I need to document whether or not you believe the Arkadelphia Bypass will result in future development within the Area of Interest (shown in attached exhibit) that would not otherwise occur. If you do believe the later to be the case, please mark those locations on the attached map (or send me any other exhibit showing where those locations are believed to occur.

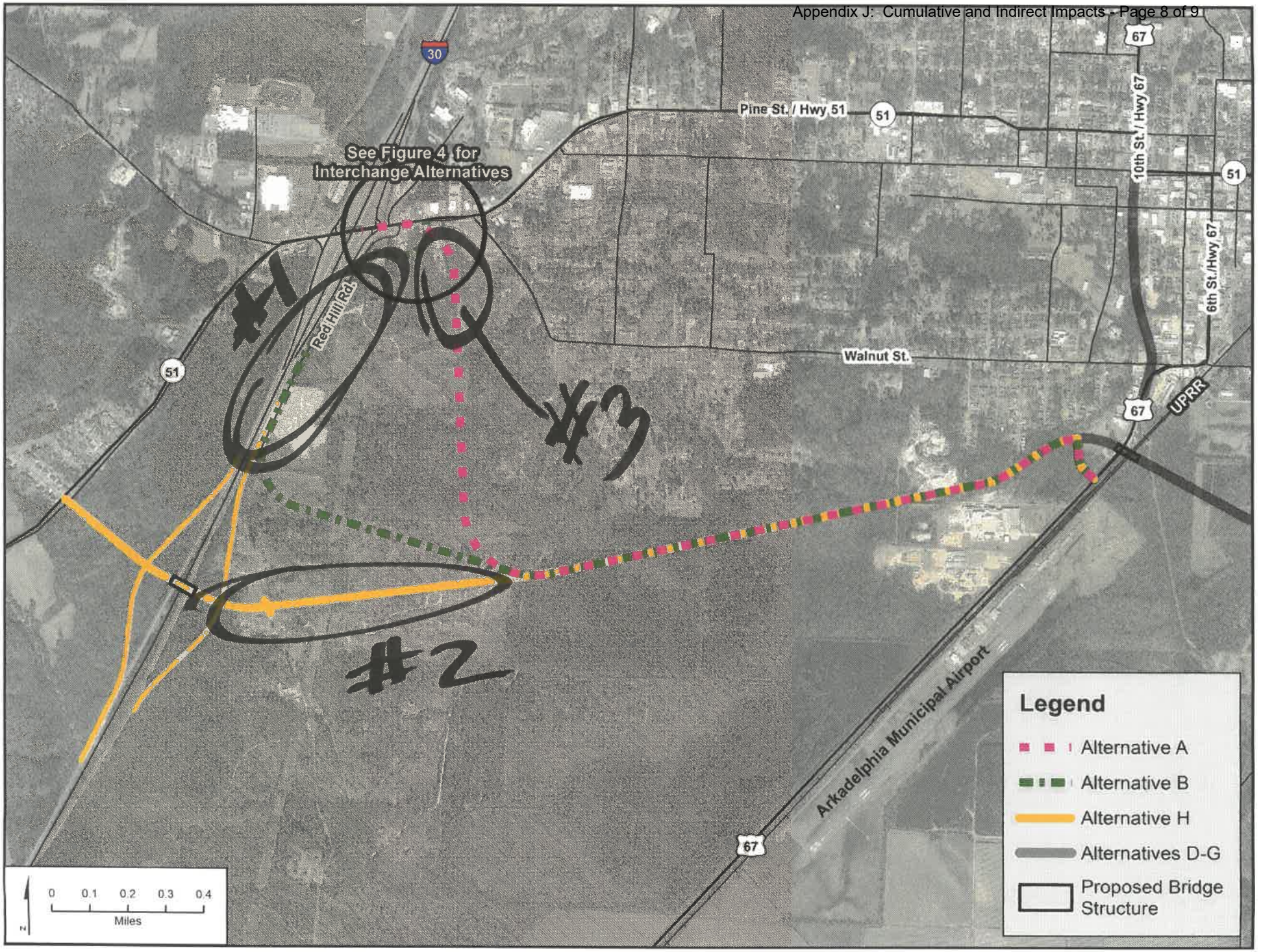
Please call or email me if you have any questions. My office number is listed below or you can reach me anytime on my cell phone (#918-440-2886). Thank you in advance for your time and assistance!

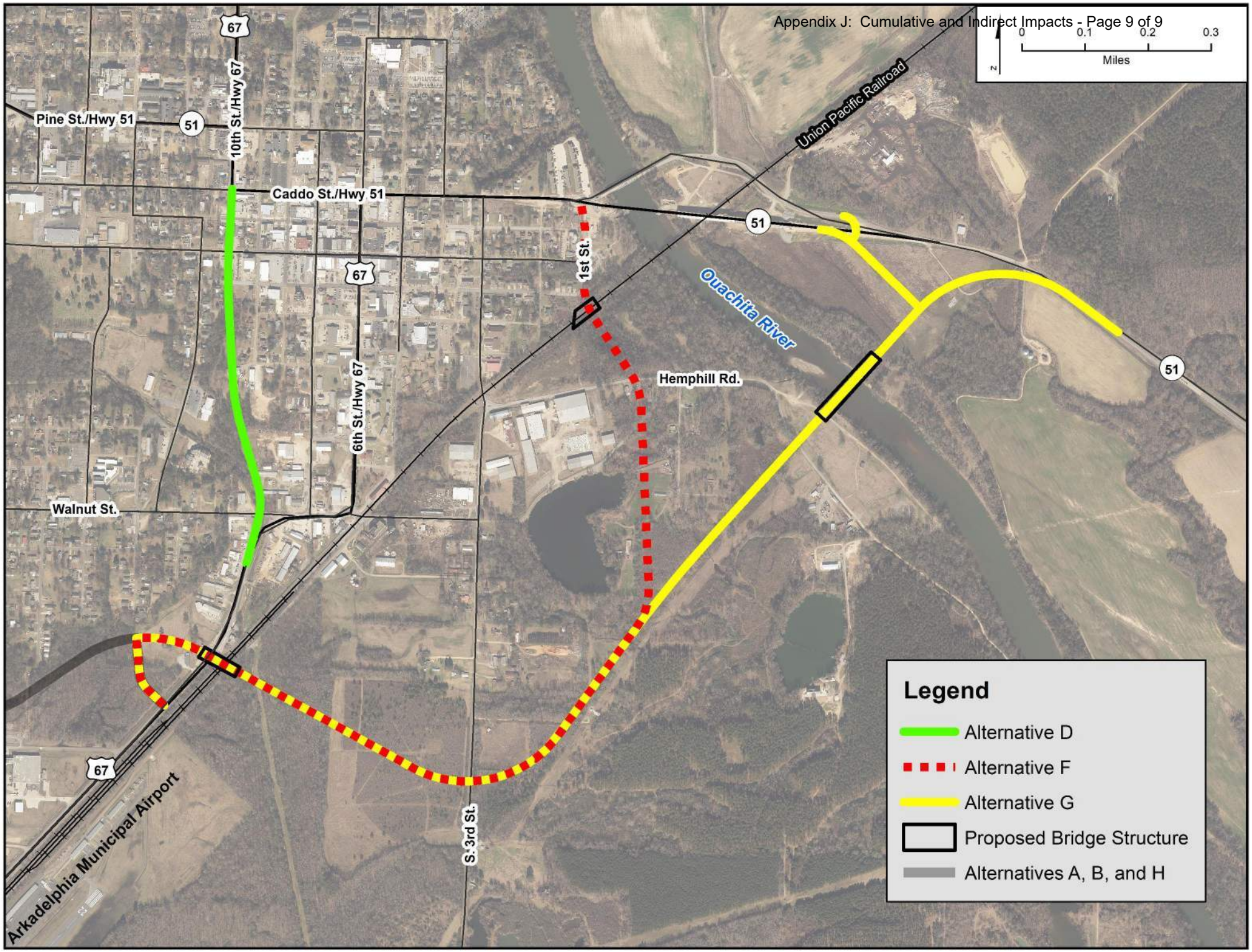
Sincerely,

Cassie Schmidt
Environmental Scientist/Environmental Specialist
Transportation Team

479-287-4673


I 30
AR 8
Pine Street
Caddo Street
Arkadelphia
North 10th Street
Ouachita River
Little Rock Subdivision
AR 7
AR 8
AR 51
51
Daleville
South 6th Street
Walnut Street
Hollywood Road
Dexter B. Florence Memorial Field Airport
US 67
67
7
8
Area of Interest
0 0.2 0.4 0.6
Miles
N


30
67
Pine St. / Hwy 51
51
10th St. / Hwy 67
51
See Figure 4 for Interchange Alternatives
#1
#3
Red Hill Rd.
51
Walnut St.
6th St./Hwy 67
67
UPRR
#2
Arkadelphia Municipal Airport
67
Legend
Alternative A
Alternative B
Alternative H
Alternatives D-G
Proposed Bridge Structure
0 0.1 0.2 0.3 0.4
Miles
N


N
0
0.1
0.2
0.3
Miles
Union Pacific Railroad
Pine St./Hwy 51
10th St./Hwy 67
Caddo St./Hwy 51
1st St.
Ouachita River
Hemphill Rd.
6th St./Hwy 67
Walnut St.
S. 3rd St.
Arkadelphia Municipal Airport
67
51
Legend
Alternative D
Alternative F
Alternative G
Proposed Bridge Structure
Alternatives A, B, and H

FEDERAL HIGHWAY ADMINISTRATION
FINDING OF NO SIGNIFICANT IMPACT
HWY. 67 - HWY. 51 (ARKADELPHIA BYPASS) P.E.
FAP STPC-9013(10)
ARDOT JOB 070442
CLARK COUNTY, ARKANSAS

Upon consideration of the approved Environmental Assessment (EA), public comments, and other considerations, the Federal Highway Administration (FHWA) has determined that the Preferred Alternative for the proposed Arkadelphia Bypass project would have no significant impact on the human or natural environment and hereby issues a Finding of No Significant Impact (FONSI) pursuant to 23 CFR 771.121(a).

The Arkansas Department of Transportation (ARDOT), in cooperation with FHWA, is proposing to construct a bypass and modify the Interstate 30 (I-30) and Highway (Hwy.) 51 interchange (I-30/Hwy. 51 interchange) in the City of Arkadelphia to improve safety, mobility, and connectivity. The project area is shown in **Figure 1**.

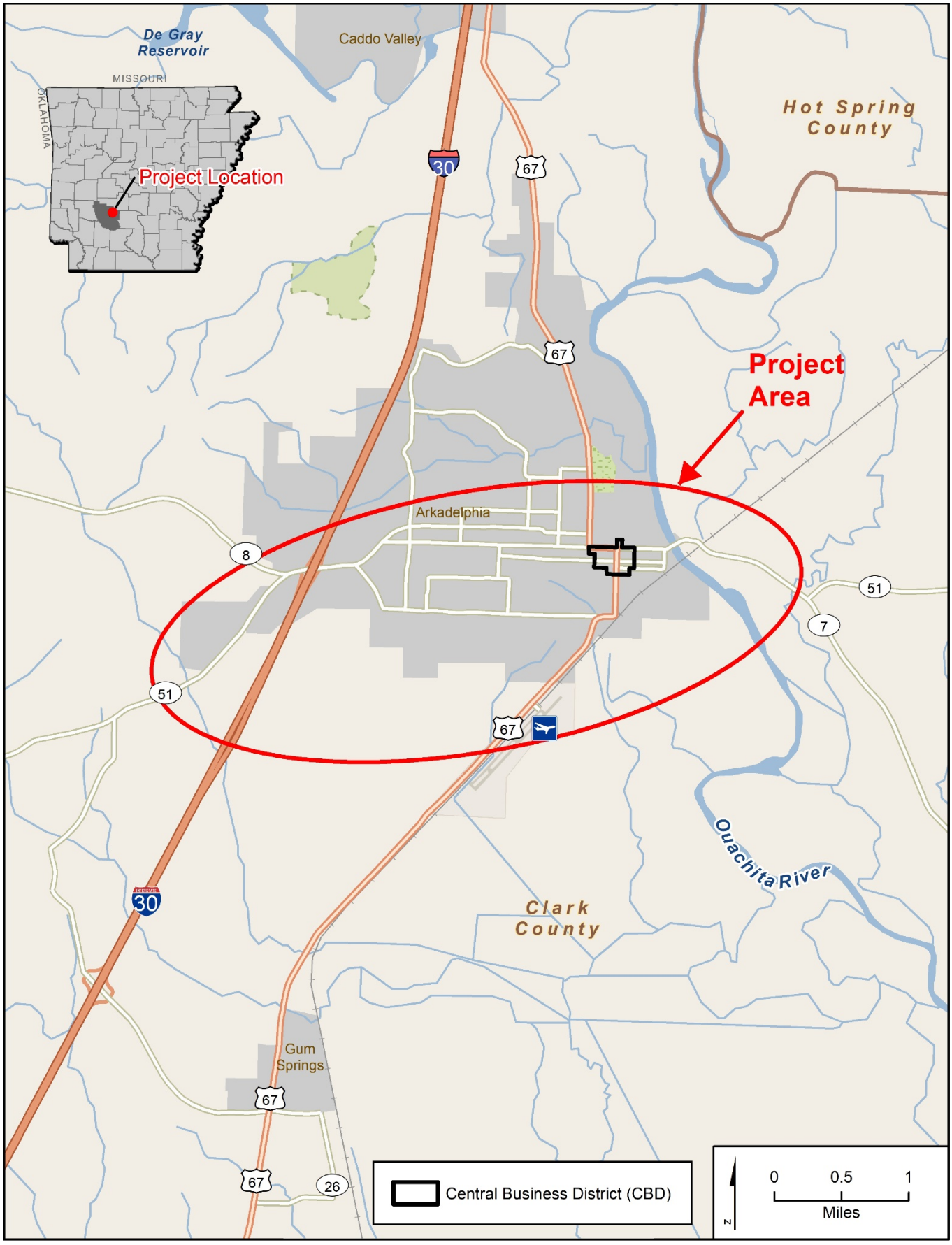
Several ARDOT planning studies have identified the Central Business District (CBD) and the east side of the I-30/Hwy. 51 interchange as areas in Arkadelphia where safety and mobility are inadequate. These studies include the 2006 Arkadelphia Truck Route Study, 2013 Arkadelphia Bypass Study, and the 2020 Arkadelphia Bypass Traffic Study.

The purpose of the project is to improve safety, mobility, and connectivity in Arkadelphia by providing:

- An alternate route to reduce the number of logging and other heavy-duty trucks traveling through the CBD;
- A more direct east-west travel route for both local and through traffic; and
- I-30/Hwy. 51 interchange modifications to reduce traffic congestion and increase emergency vehicle access to and from the Baptist Health Medical Center.

This FONSI is based on the FHWA's independent evaluation. The information contained in the EA has been determined to discuss the need, environmental impacts, and appropriate mitigation measures adequately and accurately for the project. The EA provides sufficient evidence and analysis for determining that no identified impacts would cause significant adverse effects to the natural, cultural, or social environments.

Figure 1: Project Area



Public Involvement

Public and local official involvement was an important part of the alternative development process. This collaboration began in early 2019 and continued throughout the EA process.

A public officials meeting and an open forum public involvement meeting were held on February 5, 2019, at Henderson State University. Including ARDOT and other staff, 19 people attended the public officials meeting, and 145 people attended the public involvement meeting. Alternatives A-G and Interchange Alternatives 1-4 were presented. Fifty-two comment forms and five letters were received. A majority of those who commented expressed a need for a bypass (46 yes; 5 no) and did not prefer improvements to Hwys. 51 and 67 instead.

Input from local, state, and federal agencies, and tribes with interests in the project area, was solicited regarding the proposed Arkadelphia Bypass project from July 2018 to June 2021. Agencies were asked to review the proposed study area and provide any information or identify concerns they may have regarding resources within their jurisdiction or expertise. Additional coordination with local officials and important stakeholders occurred throughout the alignment development process.

Local official and public input from the February 2019 meetings resulted in the development of an additional West Bypass Alternatives to connect the bypass directly to I-30 and an Interchange Alternative was added.

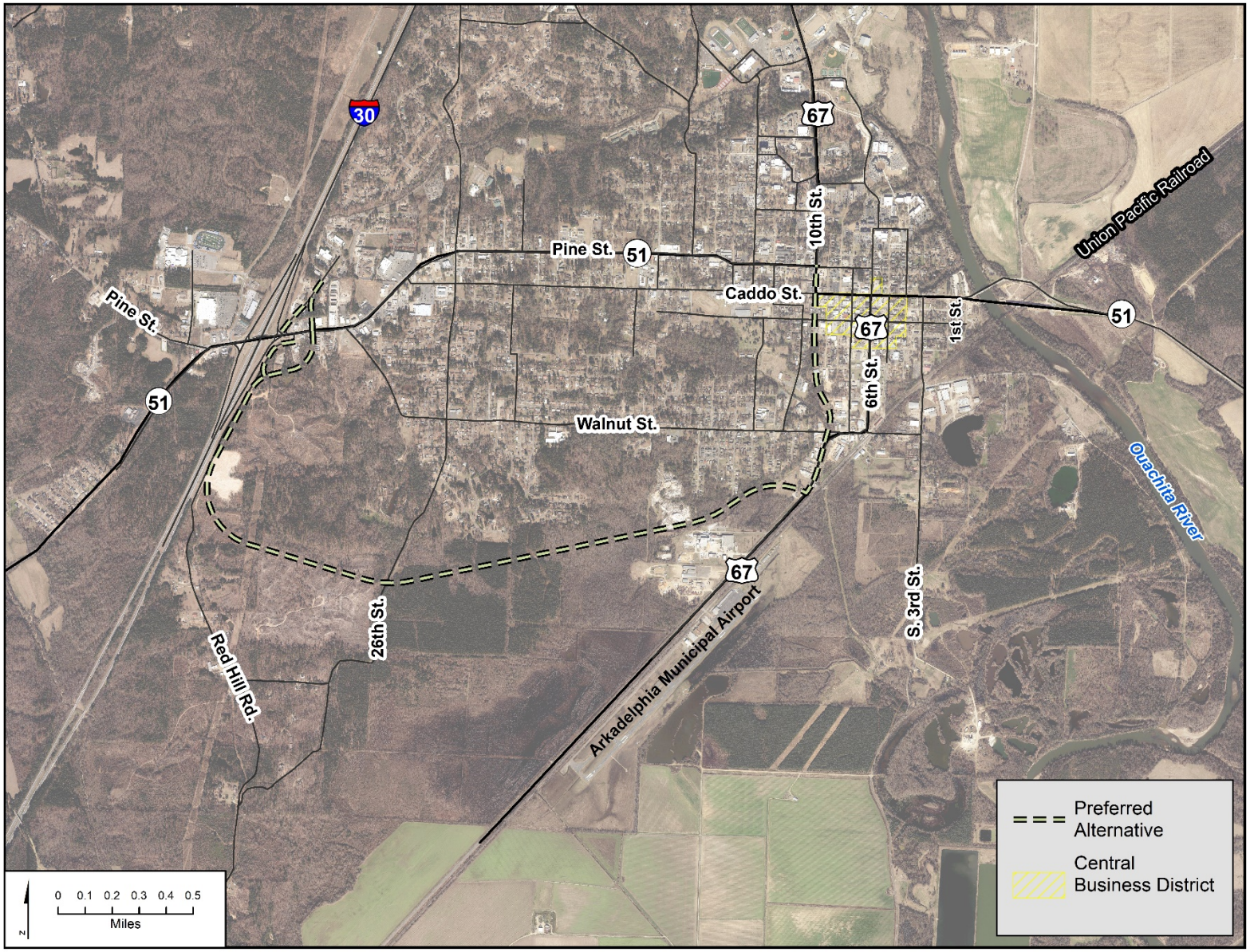
A virtual Location Public Hearing (LPH) was held online at the project website (Arkadelphiabypass.transportationplanroom.com) between October 18 and December 4, 2020. Live virtual meetings with local officials and the public were held on November 19, 2020. A total of 1,839 unique visitors accessed the meeting, 58 officially signed in, and a total of 35 comments (public and public officials) were recorded in the disposition of comments. Overall, the majority of comments were in support of the Arkadelphia Bypass, but there were some comments opposing specific optional segments since a Preferred Alternative had not been identified. The LPH synopsis with the disposition of comments is provided in **Appendix A**.

In response to local officials and ARDOT comments following the LPH, turn lanes were added at the intersection of Caddo Street and Hwy. 67 to better accommodate large truck movements. These improvements were also added to tie together improvements for this project and the planned improvements for Pine Street (ARDOT Job 070439).

The ARDOT Interdisciplinary Team reviewed the public and other stakeholder comments as well as important project information and identified a Preferred Alternative that addressed the purpose and need of the project while minimizing the environmental impact to the greatest extent possible.

The Preferred Alternative is a combination of Alternative D, Alternative B, and Alternative 3 (**Figure 2**).

Figure 2: Preferred Alternative



A virtual Design Public Hearing (DPH) was held at the project website (Arkadelphiabypass.transportationplanroom.com) between May 23 and July 7, 2021. Live virtual meetings with local officials and the public were held on June 22, 2021. A total of 1,117 unique visitors accessed the meeting, 47 officially signed in, and a total of 29 comments (public and public officials) were recorded in the disposition of comments. Overall, the majority of comments were in support of the Preferred Alternative for the Arkadelphia Bypass with six commentors opposed for various reasons. The DPH synopsis with the disposition of comments is provided in Appendix A.

The typical section varies across the bypass as described in the following paragraphs.

The typical section for Hwy. 67 between Pine Street and the interchange with the bypass south of Walnut Street for the initial buildout consist of two travel lanes and a middle turn lane with curb and gutter, sidewalk and open ditches behind the sidewalk (**Figure 3**). The ultimate future buildout for this section, when traffic warrants, would consist of four travel lanes and a continuous left-turn lane with curb and gutter (**Figure 4**). The initial and ultimate future typical section from the north end of Redhill Road to Hwy. 51 is the same as shown in **Figure 5** and **Figure 6** except there will not be open ditches behind the sidewalk.

Figure 3: Hwy. 67 Urban Typical Section - Initial

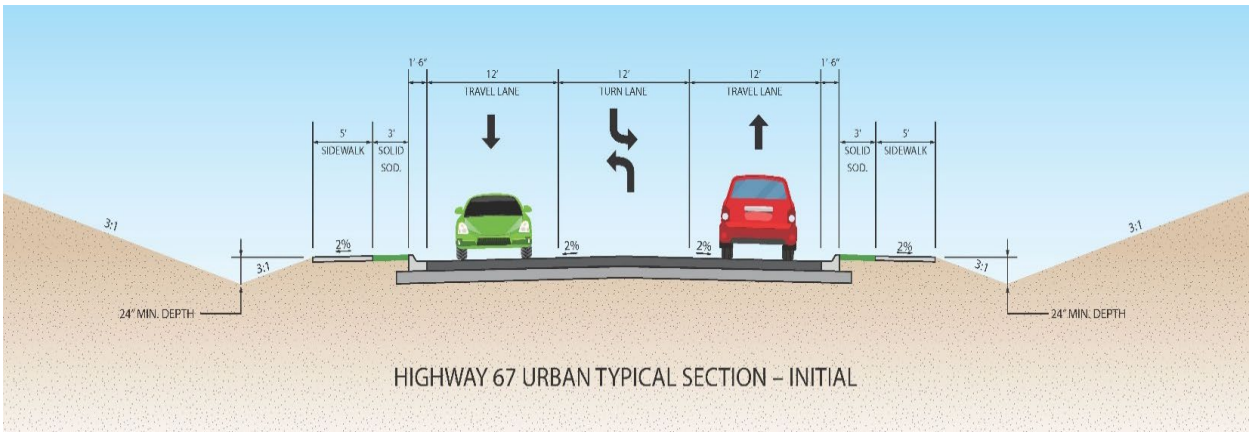
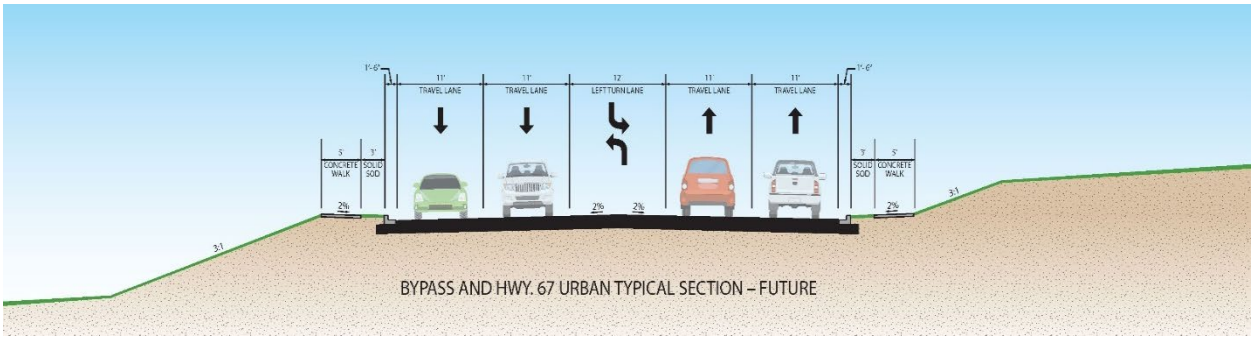


Figure 4: Bypass and Hwy. 67 Urban Typical Section - Future



The typical section for the southern portion of the bypass between Hwy. 67 and the north end of Redhill Road would consist of two travel lanes and a middle turn lane with open shoulders for the initial buildout (Figure 5). The ultimate future buildout for this section, when traffic warrants, would consist of four travel lanes with a painted median and open shoulders (Figure 6).

Figure 5: Bypass Rural Typical Section - Initial

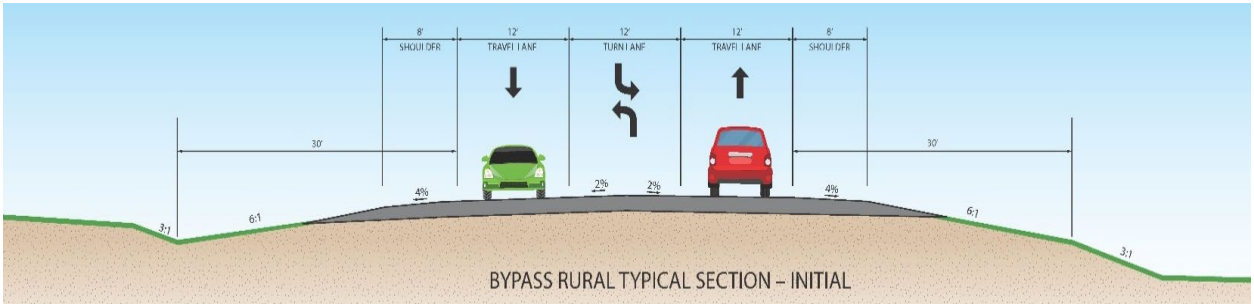
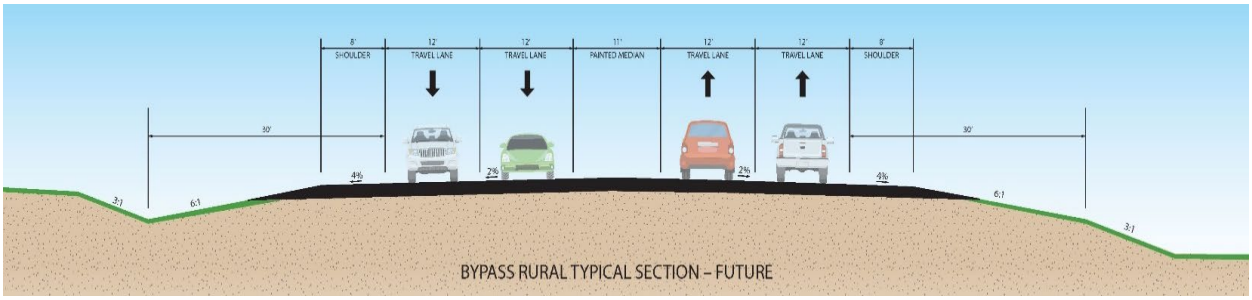


Figure 6: Bypass Rural Typical Section - Future



Environmental Impacts

Environmental impacts changed since the EA was signed and have been updated to reflect the current design. The additional impacts to each resource, if any, were minor. All impacts for the Preferred Alternative are shown in **Table 1** and discussed in the following sections.

The FHWA finds that the project would not impose significant impacts to the social, cultural, or natural environment.

Table 1: Preferred Alternative Impacts

Resource Category	Preferred Alternative
Length (miles)	4.0
ROW Required (acres)	112
Total Cost (dollars)	$37,085,000
Residential Relocations (number)	2

Resource Category	Preferred Alternative
Business Relocations (number)	11
Environmental Justice (mobile homes)	2
100-Year Floodplain (acres)s	10
Wetlands (acres)	36
Stream (acres)	3
Prime Farmland (acres)	29

Right of Way / Land Use

The Preferred Alternative would require approximately 112 acres of new right of way (ROW). Land would be converted from a mix of undeveloped land and business uses to ARDOT-owned ROW maintained for transportation use.

The FHWA finds that there are no significant impacts to private property or land use anticipated with the Preferred Alternative.

Environmental Justice

This project was developed in accordance with *The Civil Rights Act of 1964*, as amended, and *Executive Order 12898* on Environmental Justice. These federal actions stipulate that no person shall, on the grounds of race, color, religion, sex, national origin, marital status, handicap, family composition, age, or income be excluded from participation in, be denied the benefits of, or be otherwise subject to discrimination under any program of the federal, state, or local government. No person was discriminated against or denied the opportunity to comment on the proposed project alternatives.

The Cox Mobile Manor mobile home park on Hwy. 51 just east of I-30 was identified as a low-income neighborhood. Design considerations associated with the Preferred Alternative reduced the number of potential relocations in the mobile home park from 18 to two. The relocation of these two mobile homes is not considered a disproportionately high or adverse impact.

In light of *Executive Order 12898*, a review of the disproportionate effects of the Preferred Alternative was conducted. By using U.S. Census Data, the Health and Human Services Poverty Guidelines, (Federal Register, February 2018), making field observations, and conducting a public involvement meeting and hearings, the determination was made that the Preferred Alternative will not have any disproportionate or adverse impacts on minorities, low-income, elderly, or disabled populations.

The FHWA finds that the Preferred Alternative would not have disproportionately high and adverse effects on minority and low-income populations, and finds that the impacts would not be significant.

Residential and Business Relocations

Two residential properties and 11 businesses may require relocation. During the final design process, opportunities to minimize or avoid impacts to these properties will be considered. Relocation assistance will be provided in accordance with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970* to mitigate any adverse effects.

The FHWA finds that there are no significant impacts associated with residential or business relocations anticipated with the Preferred Alternative.

Noise

Potential alignment alternatives were screened with a tiered process outlined in the noise screening analysis completed for the EA. As a result of potential traffic noise impacts identified in the screening process, a Traffic Noise Assessment Study was completed and approved in May 2021 (**Appendix B**). The report findings indicated that no receivers will approach or exceed the 67 dBA threshold for Noise Abatement Criteria Category B (residential), and no receivers will be impacted by a substantial increase of 10 dBA or more as defined in the ARDOT Noise Policy. As a result of no anticipated impacts to noise-sensitive receptors, noise mitigation is not proposed for this project.

Minor improvements between Caddo and Pine Streets were proposed after the original noise study was prepared. Consequently, a noise study review was completed. The review indicated that additional noise analysis was not warranted for the proposed improvements.

The FHWA finds that noise impacts are not significant.

Cultural Resources

A cultural resource survey and historic structure survey were completed for the project in accordance with Section 106 of the *National Historic Preservation Act*. Clearance received from the State Historic Preservation Officer in April 2021 concurred that no historic properties will be affected by the Preferred Alternative (**Appendix C**).

The FHWA finds that impacts to cultural resources/historic resources are not anticipated.

Floodplains and Prime Farmland

The Preferred Alternative will impact approximately 10 acres of the 100-year floodplain and not result in a net rise of the floodplain or affect surface water elevations. Overall, the project will be designed to minimize adverse impacts to the floodplain's natural and beneficial values. Implementation of the Preferred Alternative will follow any local or state floodplain management plans, and coordination with the Local Floodplain Administrator will take place for concurrence of the grading plan and project approval.

The Preferred Alternative would acquire approximately 29 acres of Prime Farmland.

The FHWA finds that floodplain and Prime Farmland impacts are not significant.

Wetlands and Streams

Based on the preliminary wetland determination, the Preferred Alternative will impact approximately 36 acres of wetlands and three streams. Approximately 350 feet of an unnamed stream will be realigned and the existing bridge at Walnut Street and Hwy. 67 will be replaced with a box culvert to improve the drainage. A final wetland delineation report will be prepared for the Preferred Alternative and a Section 404 permit application will be submitted to the U.S. Army Corps of Engineers (USACE). An individual permit is anticipated. Mitigation for impacts will first be sought from an approved mitigation bank within the primary service area, and if no banks are available, mitigation will be acquired from the closest approved mitigation bank.

The FHWA finds that impacts to wetlands and waters of the U.S. are not significant.

Protected Species

The U.S. Fish and Wildlife Service (USFWS) Section 7 consultation finalized in July 2021indicated that no further consultation for any of the listed species is required for the Preferred Alternative. The updated species list is provided in **Table 2** and the USFWS coordination is provided in Appendix C.

Table 2: Threatened and Endangered Species Impacts Associated with the Preferred Alternative

Species/Critical Habitat	Habitat Determination	USFWS Effects Determination
Eastern Black Rail (*Laterallus jamaicensis spp. jamaicensis*)	Potential Suitable Habitat Present	Not Likely to Adversely Affect
Northern Long-eared Bat (*Myotis septentrionalis*)	Potential Suitable Habitat Present	May Affect; Action is consistent with activities analyzed in the Programmatic Biological Opinion on Final 4(d) Rule
Piping Plover (*Charadrius melodus*)	No Suitable Habitat	Not Likely to Adversely Affect
Red Knot (*Calidris canutus rufa*)	No Suitable Habitat	Not Likely to Adversely Affect
Red-cockaded Woodpecker (*Picoides borealis*)	Potential Suitable Habitat Present	Not Likely to Adversely Affect
Winged Mapleleaf (*Quadrula fragosa*)	No Suitable Habitat	Not Likely to Adversely Affect

The FHWA finds that there are no significant impacts to threatened or endangered species.

Hazardous Materials

The Citgo Gas Station located south of Hwy. 51 and east of I-30 and the Phillips 66 gas station located on the corner of Hwy. 67 (10th Street) and Hwy. 51 (Caddo Street) are both directly impacted. However, the underground storage tanks (UST) are not directly impacted for either location. Neither of these sites were determined to be at high risk for the presence of petroleum or other hazardous material contamination.

If required, USTs would be removed by an Arkansas Department of Environmental Quality (ADEQ) licensed contractor qualified for UST removal operations. If hazardous materials are identified, observed, or accidentally uncovered, work would be halted and the appropriate regulatory agencies would be notified. Prior to resuming construction, the type of contaminant and extent of contamination would be identified. If necessary, a remediation and disposal plan would be developed. All remediation work would be conducted in conformance with the ADEQ, Environmental Protection Agency (EPA), and Occupational Safety and Health Administration (OSHA) regulations.

The FHWA finds that hazardous materials impacts are not significant.

Indirect and Cumulative Effects

The Preferred Alternative will have the potential for stormwater runoff due to ground disturbance during construction and, therefore, may temporarily cause indirect impacts to surface water quality, streams, and wetlands. Indirect impacts to land use and other growth effects related to induced changes in the pattern of land use or population density may occur with the Preferred Alternative; however, no reasonably foreseeable projects have been identified by city and county officials.

Aquatic features and wildlife habitat were analyzed for cumulative effects. The estimated impacts to water resources and wildlife habitat are considered minor compared to the amount of each resource within the project area. Additionally, as the proposed project and the reasonably foreseeable projects occur within areas immediately adjacent to already-urbanized areas or adjacent to a roadway, further habitat fragmentation will be minor. Thus, for the above-described reasons, coupled with the use of construction Best Management Practices, substantial cumulative impacts to water resources and wildlife habitat are not expected to influence other areas of the watershed.

The FHWA finds that indirect and cumulative impacts would not be significant.

Commitments

Commitments made for the proposed project are as follows:

- All land acquisitions and relocation assistance will comply with relocation assistance guidelines. A residential relocation plan for the Preferred Alternative will be required prior to

any acquisition of property. A review of sufficient replacement housing within the City of Arkadelphia will be included in a relocation plan prior to acquisition.

- If hazardous materials, unknown illegal dumps, or USTs are identified or accidentally uncovered by ARDOT personnel or its contractors, the type and extent of the contamination will be determined according to the ARDOT's response protocol. In cooperation with the ADEQ, appropriate remediation and disposal methods will be determined.
- An asbestos survey will be conducted by a certified asbestos inspector for any buildings acquired for demolition. All asbestos-containing materials will be removed prior to demolition in accordance with ADEQ, EPA, and OSHA.
- The City of Arkadelphia will ensure that the design meets the requirements of "no net rise" certification for all floodplains and floodways under their jurisdiction impacted by the project.
- All borrow pits, waste areas, and work roads will be surveyed for historic properties when locations become available.
- A final wetland delineation on the Preferred Alternative will be conducted and submitted to the USACE and the appropriate Section 404 permit will be determined at that time. An individual permit is anticipated.
- Project construction will be in compliance with all applicable Clean Water Act, as amended, requirements. This includes obtaining Section 401 Water Quality Certification; Section 402 National Pollutant Discharge Elimination Permit; and Section 404 Permit for Dredged or Fill Material.
- Stream and wetland mitigation will be offered at an approved mitigation bank site with a proximity factor applied as the project is not currently within the service area of any mitigation banks with available credits. The mitigation ratio will be approved during the Section 404 permitting process.
- A Water Pollution Control Special Provision will be incorporated into the contract to minimize potential water quality impacts.
- Appropriate action will be taken to mitigate any permanent impacts to private drinking water sources should they occur due to this project.
- A wildflower seed mix will be included in the permanent seeding for the project.

Council on Environmental Quality Regulations

The 2020 Council on Environmental Quality regulations require consideration of a project's affected environment and degree of effect in determining whether the project would have a significant impact (40 CFR 1501.3).

Regarding the potentially affected environment, “agencies should consider, as appropriate to the specific action, the affected area (national, regional, or local) and its resources, such as listed species and designated critical habitat under the ESA. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend only upon the effects in the local area.”

“In considering the degree of the effects, agencies should consider the following, as appropriate to the specific action: (i) Both short- and long-term effects. (ii) Both beneficial and adverse effects. (iii) Effects on public health and safety. (iv) Effects that would violate Federal, State, Tribal, or local law protecting the environment.”

The following issues are considered in the determination of whether there are significant impacts:

1. Impacts that may be both beneficial and adverse.

In addition to the adverse impacts described above, the Preferred Alternative is also anticipated to improve safety, mobility, and connectivity in Arkadelphia by providing: an alternate route to reduce the number of logging and other large trucks traveling through the CBD; a safer east-west travel route for both local and through traffic; and I-30/Hwy. 51 interchange modifications to reduce traffic congestion and increase emergency vehicle access to and from the Baptist Health Medical Center.

2. The degree to which the project affects public health or safety.

One aspect of the proposed project’s purpose and need was to provide improved access to and from the Baptist Hospital and reduce congestion and safety concerns on Hwy. 51 just east of the I-30 interchange. This safety and access improvement was accomplished through the improved intersections and access roads on the south side of Hwy. 51 and the relocated Professional Park Drive on the north side of Hwy. 51. The project is not anticipated to have any adverse public health or safety impacts.

3. Unique characteristics of the geographical area such as proximity to historic or cultural resources, parks, prime farmland, wetlands, wild and scenic rivers, or ecologically critical areas.

Wetland and stream impacts will be mitigated through the purchase of credits at an approved wetland mitigation bank. Prime farmland impacts will be minimal and not require mitigation. There are no adverse impacts expected to any historic or cultural resources, wild and scenic rivers, or ecologically critical areas.

4. The degree to which the effects on the environment are expected to be highly controversial.

The term “controversial” refers to cases where substantial dispute exists as to the size, nature, or effect of the action rather than to the existence of opposition to a use, the effect of which is

relatively undisputed. A Public Involvement Meeting, an LPH, and a DPH were conducted for the proposed project. Several comments were received in favor of the proposed project and its benefits. Most public feedback was neutral with commenters making design suggestions or inquiring about access, traffic, property values, or environmental impacts. Only a few negative comments were received regarding concerns for business impacts.

5. The degree to which the effects on the quality of the human environment are highly uncertain or involve unique or unknown risks.

The impacts to the human environment are well-document in the EA. There are no known impacts to the quality of the human environment that can be considered highly uncertain or involve unique or unknown risks.

6. The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.

The FHWA's regulations at 23 CFR 771.115(a) list the types of actions normally requiring the preparation of an Environmental Impact Statement. A local improvement project, such as the Arkadelphia Bypass, is not included on the list. The project has logical termini and independent utility and represents a reasonable expenditure; it does not force additional improvements to be made to the transportation system. This action would not set a precedent for future actions with significant effects or represent a decision in principle about a future consideration.

7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.

As outlined in the EA and this FONSI, only minor cumulative impacts on resources such as streams and wetlands are anticipated. No significant cumulative effects have been identified for the proposed project.

8. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss of significant scientific, cultural, or historic resources.

Pursuant to the to Section 106 of the National Historic Preservation Act, the presence of cultural resources in the project area were assessed. No cultural or historic resources were identified and the SHPO has determined that the Preferred Alternative would not impact historic properties.

9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act.

Although there is potential habitat in the project area for six threatened or endangered species,

the USFWS has made determinations of “not likely to adversely affect” for five of the six species and “may affect; action is consistent with activities analyzed in the Programmatic Biological Opinion on Final 4(d) Rule” for the Northern Long-eared Bat.

10. Whether the action threatens a violation of federal, state, or local law or requirements imposed for the protection of the environment.

The proposed action does not knowingly threaten a violation of any federal, state, or local law for the protection of the environment. All applicable permits would be acquired prior to construction.

Conclusion

Based upon the EA, the Public Involvement Meeting and the LPH and DPH comments, the Dispositions of Public Comments, and the foregoing information and other supporting information, the FHWA concludes that the Preferred Alternative will not have a significant impact on the environment. Therefore, no additional NEPA documentation is required for this project. If changes in laws or regulations that apply to the project occur during design or construction, or there are major design changes that result in significantly greater impacts than those described in this document, a re-evaluation of the EA will be performed. The ARDOT has completed the assessment of the proposed project and the FHWA issues a finding of no significant impact for the Hwy. 67 - Hwy. 51 Arkadelphia Bypass project in Arkadelphia, Clark County, Arkansas.

Randal Looney
Environmental Coordinator

August 17, 2021
Date of Approval

U.S. Department of Transportation
Federal Highway Administration, Arkansas Office

Appendix A – PUBLIC HEARING SYNOPSIS AND DISPOSITION OF COMMENTS

Public Involvement Synopsis

ARDOT Job Number 070442
Arkadelphia Bypass
Virtual Meeting with Live Event
May 23, 2021 – July 7, 2021

A Virtual Design Public Hearing was held to present the Arkadelphia Bypass (Hwy. 67 – Hwy. 51) Project in Clark County, Arkansas.

The virtual hearing was held at ArkadelphiaBypass.TransportationPlanRoom.com and ArkadelphiaBypass.es.TransportationPlanroom.com in English and Spanish from Sunday, May 23 through Wednesday, July 7, 2021. A public officials meeting was held via video conference on Tuesday, June 22, 2021. Additionally, a Virtual Design Public Hearing live event was held Tuesday, June 22, 2021. Special efforts to involve minorities and the local community in the virtual public involvement meeting included the following:

- Legal ad published in the Arkansas Democrat Gazette on May 23, 2021
- Display ads placed in the Arkansas Democrat Gazette (June 6 and 20, 2021)
- PSA aired on Power 92.3 FM (2X daily June 19 through June 22, 2021)
- Postcards (282) mailed to attendees from the November 2020 public hearing and potentially impacted property owners
- Letters mailed to public officials
- Emails sent to public officials, agencies, stakeholders, and the public
- Social media blasts: Twitter - ARDOT (May 25, June 2, 7, 11, 16, 21, 22, 28, July 1,6), IDrive Arkansas (20, 21, 22), Facebook – City of Arkadelphia (June 22), VP of Student Development at OBU (June 22), VP of Arkadelphia Alliance & Area Chamber of Commerce (June 22)
- News release published by ARDOT on June 8
- Notification/website link posted on ARDOT website

The live virtual public hearing was held on June 22, 2021 at 5:30 p.m. for one hour. The first 30 minutes consisted of a presentation, including the pre-recorded project video, instructions on how to submit comments and utilize Microsoft Teams, and an overview of the preferred alternative using an interactive project map. The meeting followed with a live question-and-answer session between attendees and subject-matter staff. Participants voiced their questions, comments, and concerns utilizing the Microsoft Teams chat function or by unmuting their device microphones.

Table 1 describes the results of the public participation at the virtual public hearing.

Table 1	
Public Officials Meeting (June 22)	**Totals**
Public Official Meeting attendees, including staff	17

Public Hearing Live Virtual Event (June 22)	**Totals**
Attendees, including staff	104

Virtual Public Involvement Meeting (May 23 – July 7)	**Totals**
Unique Visitors (New Users)	1,117
Visits to the Website (Sessions)	1,578
Number of Website Pages Viewed (Pageviews)	3,690
Percent of Total Users Interacting with Mobile Devices/Tablets	50%
Comment Forms, emails, or Letters Received	19
Comments on Interactive Map	4
Phone calls	6
Attendees who Signed Electronic Sign-in Sheet	47

Table 2 identifies the information available on the English virtual public hearing website and each page's number of views.

Table 2		
Website Page	**Pageviews (3,690)**	**Excluding Homepage (1,944)**
Homepage • Text: Information on the meeting's purpose, virtual meeting dates, a phone number for anyone with limited internet access or general questions or comments, submitting written comments, and guidance for special accommodations	47% (1,746)	
Meeting Registration • Electronic sign-in sheet	3% (94)	5%
Introduction Video • Recorded video presentation highlighting the purpose of the virtual meeting and live event, the purpose of the project, project history and what has occurred since the November 2020 hearing, an overview of the preferred bypass alternative, typical sections, and submitting comments. A pdf with the voiceover script was also available.	5% (173)	9%
Project Documents • Public Hearing Packet; Project Summary Sheet; Roll Plot of Preferred Alternative; Hwy. 67 & Caddo St. Intersection Roll Plot; Typical Sections; Environmental Impacts Table; Right of Way Procedures for Acquisition; and Environmental Assessment and appendices previously published during November 2020 Virtual Location Public Hearing	9% (322)	17%
Interactive Project Map • Link: ArcGIS corridor map on Street View showing the preferred bypass alternative and typical sections, with the ability to leave comments on the map • Text: Instructions to use the interactive map	20% (748)	38%
Live Event Information • Link: Microsoft Teams Live Event Meeting • Text: Instructions to use the Microsoft Teams Application and how to attend the Live Event • Video recording of live event	15% (546)	28%
Submit a Comment • Print and electronic versions of the comment form	1% (52)	3%

Table 3 describes the results of the public participation at the Spanish virtual public hearing.

Table 3	
Virtual Public Involvement Meeting (May 23 – July 7)	**Total**
Unique Visitors (New Users)	6
Visits to the Website (Sessions)	13
Number of Website Pages Viewed (Pageviews)	32
Percent of Total Users Interacting with Mobile Devices/Tablets	67%
Comment Forms or Letters Received	0
Attendees who Signed Electronic Sign-in Sheet	0

Table 4 identifies the information available on the Spanish virtual hearing website and each page's number of views.

Table 4		
Website Page	**Pageviews (6)**	**Excluding Homepage (2)**
Homepage • Text: Information on the meeting's purpose, virtual meeting dates, a phone number for anyone with limited internet access or general questions or comments, submitting written comments, and guidance for special accommodations	67% (4)	
Meeting Registration • Electronic sign-in sheet	0% (0)	0%
Introduction Video • Recorded video presentation highlighting the purpose of virtual meeting and live event, the purpose of the project, project history and what has occurred since the November 2020 hearing, an overview of the preferred bypass alternative, typical sections, and submitting comments. A pdf with the voiceover script was also available.	17% (1)	50%
Project Documents • Public Hearing Packet; Project Summary Sheet; Roll Plot of Preferred Alternative; Hwy. 67 & Caddo St. Intersection Roll Plot; Typical Sections; Environmental Impacts Table; Right of Way Procedures for Acquisition; and Environmental Assessment and appendices previously published during November 2020 Virtual Location Public Hearing	17% (1)	50%
Interactive Project Map • Link: ArcGIS corridor map on Street View showing the preferred bypass alternative and typical sections, with the ability to leave comments on the map • Text: Instructions to use the interactive map	0% (0)	0%
Live Event Information	0%	0%

• Link: Microsoft Teams Live Event Meeting • Text: Instructions to use the Microsoft Teams Application and how to attend the Live Event • Video recording of live event	(0)	
Submit a Comment • Print and electronic versions of the comment form	0% (0)	0%

Garver staff reviewed all comments received and evaluated their contents. The summary of comments listed below reflects the personal perception or opinion of the person or organization making the statement. The sequencing of the comments is random and is not intended to reflect importance or numerical values. Some of the comments were combined and/or paraphrased to simplify the synopsis process.

Summarized Comments

- 6 participants disagree with the bypass. Reasons for disagreement are related to job displacement, impacts to jobs/businesses along the project route, the 60 MPH design for the facility, and concerns about tax dollar spending.
- 11 participants inquired about various project components consisting of potential access to the bypass from their properties, impacted property lines/parking spaces, noise levels, property owner compensation, and general information concerning potential property impacts.
- 1 participant inquired about the outreach methods/when project staff would talk with those directly impacted.
- 1 participant were curious about the funding for the project and the timeline of the project and right-of-way acquisition.
- 3 emails were received concerned about potential property impacts, property owner compensation, and concerns with turning left at the I-30 exit on to Pine Street.
- 5 comments were duplicates of original comments and submitted by a different means (e.g., sending an email and a comment form).
- 1 participant supported the project with no comments or inquiries.

Comments received by those representing: *additional comments received either did not specify or were follow up comments/inquiries.
Agency/Organization: Red River Baptist Association, Lighthouse Ministries & RRBA Disaster Relief, Lucky Liquor of Arkadelphia, KFC, Justice of the Peace Clark County District 7, Jim Geels Littlefield Oil Co.

Attachments:

- Screenshots of virtual public meeting site
- Presentation Transcript
- Small-scale display maps and exhibits
- Website analytics reports
- Copies of sign-in sheets and submitted comment forms
- Outreach documents

Virtual Design Public Hearing Public Disposition of Comments

Arkadelphia Bypass Hwy. 67 – Hwy. 51

ARDOT Job 070442

Commentor	Comment Method	Comment	Response
1. Miranda M Childs	Interactive Map (exhibit at end of document)	This building does not have enough parking right now. If you take the parking lot any it will make the building unusable. My office will have to move. This road doesn't need to extend this far. This section of road expansion serves no purpose.	The transition distance to rotate the superelevated roadway of the new curve on Professional Park Dr. back to normal crown is 112.5' from the north end of the curve which requires the road to be rebuilt in front of 312 Professional Park Dr. During construction of the project access will be maintained to properties along Professional Park Dr.
2. Miranda M Childs	Interactive Map (exhibit at end of document)	The road could end here. There is no reason to extend this to extend in front of the building at 312 Professional Park Dr, Arkadelphia,AR. This building houses a dental practice, Baptist Physical Therapy, and Devita Kidney Dialysis.	All efforts will be made to minimize impacts as much as possible, but the improvements will require some impacts to the parking due to its close proximity to the existing roadway. During the right of way acquisition process, ARDOT will assess any possible mitigation for the loss of parking.
3. Joseph Burt	Interactive Map (exhibit at end of document)	According to previous meetings 905 HWY 65 would not be affected by the construction. According to this new markers you are planning on taking a majority of our field and part of Parking. We are a ministry that works with the community.	The right of way is required for the future 5 lane section and bridge over Hwy 67.
4. Billy West	Interactive Map (exhibit at end of document)	Alignment Overview video, at approximately 4:56, states that 10th Street dead ends at Clinton Street where, in fact, it continues on South about 200 feet or so to the West to dead end at Walnut Street.	Thank you for your comment.
5. Jackson Hurst	Online Comment Form	I approve and support ARDOT's Arkadelphia Bypass Project. The aspect that I love about ARDOT's Arkadelphia Bypass Project is that the Arkadelphia Bypass will take logging trucks and freight traffic off of AR 51 which will improve safety and reduce congestion on AR 51.	Thank you for your comment.
6. Laura Pierce	Online Comment Form	I disagree with the bypass. If it passes thats 11 Business that some cant relocated because of the law of how many feet to churches, day cares and schools. Those business pay tax money every year to the city and donate to events for more money to the city. I really think this does not need to happen.	Thank you for your comment.
7. Brady Boyette	Online Comment Form	I'm against it because i will lose my job and 10-11 other businesses will close down, people will lose their home, we will have to pay more in taxes all because they dont want log trucks coming down the road. the f*** type of stupid **** is that. this is a college town invest in entertainment instead of *******.	Thank you for your comment.
8. Matthew Norman	Online Comment Form	A waste of my tax dollars which no one will be able to pay because yall want to effect 11 local business's for a by pass we don't even need.	Thank you for your comment.

Virtual Design Public Hearing Public Disposition of Comments

Arkadelphia Bypass Hwy. 67 – Hwy. 51

ARDOT Job 070442

Commentor	Comment Method	Comment	Response
		putting so many people out of jobs and an entire trailer park of people who have no where to go or probably the money to go anywhere. I work for the liquor store called lucky's and were supposed to get torn down and we cant even relocate because yall's law of cant be to close to a school day care or church. this effects more businesses and people than yall know. once everyone's taxes get raised to pay for it and the liquor store is gone the city will outrage and get worse than it already has over the years. i vote no against the tax raise and no against the "project"	
9. John Cloud	Online Comment Form	We live a quarter mile from the bypass, and we are concerned about noise from the trucks, jake-breaking for instance. Why can't we locate the bypass farther south away from our homes? We never enforced the jake breaking law, but even heavy trucks are loud no matter what. The serenity of our neighborhood is our best asset by far.	Multiple alternatives were considered for this project and the preferred alternative was identified through a collaboration with city official and the public.
10. Joe Burt	Online Comment Form	Please contact us concerning the land that you may be taking from us.	A member of the project team contacted Mr. Burt. See comment #3
11. Bill R. Alexander	Online Comment Form	Please reconsider the 60 MPH speed limit on the bypass between Red Hill Road and South 26th/Valleyview Road. Their are a significant number of residences that will have to access Red Hill Road and several other roads from either Red Hill or Valleyview. Neither my wife, nor myself relish having to access or cross the bypass while dodging 60MPH traffic, especially big trucks.	60 mph is the design speed and will not necessarily be the posted speed. The Average Daily Traffic for the Bypass is expected to be 1400 vehicles per day in the opening year and 1600 vehicles per day, 20 years later. The lower volume should create traffic gaps that safely allow access to and from the Bypass.
12. Roger Lane	Online Comment Form	I watched presentations last night & gentlemen said everyone directly impacted by project has been contacted. I have not been contacted in any form. When will that take place? Thanks Roger Lane	Property owners were mailed meeting notices for the design public hearing. Impacted property owners will be contacted by the ARDOT ROW Division prior to construction.
13. M Mcinerney	Online Comment Form	you want to see a fall out trucks going thru town city complaints you will be a ghost town! delays.!funding think im kidding better look at greenville ms,you cant give your home away nor business same thing logging trucks many lost money there in court fighting to get there funds back from the bath and it is a bath good luck on this one	Thank you for your comment.
14. Roger Wingfield	Online Comment Form	I own property at 721 S 7TH Street. I would like road access added to the back of my property to the highway. Also I would like to know about the right-of-way over to the creek.	The project team will look into providing access to the back of the property and having the access approved through ARDOT. Regarding property to the west of the bypass, discussions on property will be part of the process with ARDOT ROW.

Virtual Design Public Hearing Public Disposition of Comments

Arkadelphia Bypass Hwy. 67 – Hwy. 51

ARDOT Job 070442

Commentor	Comment Method	Comment	Response
15. Taylor Chaney	Online Comment Form	Clark County passed a bond on June 8, 2021 to fund its portion of this project. During the public meeting on 6/22/21, Garver and ArDOT officials could not answer questions about the priority of this project, or how long it would take. How long does it generally take to complete the EIS process, acquiring the right of way from land owners, and construction for a project of this size? Comparable examples would be Sherridan, Jonesboro, etc. Also, its my understanding there are no issues with the state funding its portion of this project as that money was allocated years ago? The representatives at the public meeting on 6/22/21 were extremely non-committal with respect to this, which indicated to me they were not the right people to ask. With Clark County doing its part, are there any funding issues to prevent this project from moving forward on the state's end? If so, will this project receive any money received from Issue 1 passing in November of 2020?	ARDOT is estimating the start for the Arkadelphia Bypass is summer 2022. The Pine Street widening project is estimated for fall 2021. These dates are preliminary and subject to change. The EA process is expected to be completed this summer or fall. Right-of-way acquisition can take as long as a year, especially with businesses being involved. Construction of the entire project, if completed as a whole, could reasonably be expected to take at least two years. However, this timeline is preliminary and subject to change. Additionally, the approved renewal and bond capacity does provide the money needed to commit to a partnership with ARDOT on the bypass. There is not any indication that the state will not be prepared to move forward with the project. We expect the project row acquisition to begin in summer of 2022. However, this timeline is preliminary and subject to change.
16. Miranda Childs Bebee	Online Comment Form/Email	How will the construction easement in the parking lot and building at 312 Professional park dr affect the operation of the offices located here? Parking is already very limited for the medical and dental offices located here. How long will the timeline of construction be for this section? Also what long term changes will be for this section in front of 312 Professional Park Dr? Thank you. Miranda Childs Bebee	All efforts will be made to minimize impacts as much as possible, but the improvements will require some impacts to the parking due to its close proximity to the existing roadway. During the right of way acquisition process, ARDOT will assess any possible mitigation for the loss of parking.
17. Roger Wingfield	Online Comment Form	I would like a back entrance added to 721 S. 7th Street or Parcel number 74-03773-000	The project team will look into providing access to the back of the property and having the access approved through ARDOT.
18. Carly Slattery	Online Comment Form	Hello, I work for the company that owns and operates the KFC in Arkadelphia. This project will impact our business to where the business will have to close. This KFC typically employs around 14 people and does fairly well in the City of Arkadelphia. We respectfully ask the City, State and DOT consider another route that would not impact our business as substantially as the current route does so that we can keep the business and continue to provide jobs in the City.	There were two other alternatives considered that would not have impacted your business. The preferred alternative that was selected through a collaborative effort with the local officials and the public will impact this business. We did consider alternative alignments for this section and none could avoid impacting the KFC.
19. Jim Geels Littlefield Oil Co.	Online Comment Form	Based upon the proposed design concept for the bypass, the location of our station at 3039 Pine would be severely impacted if our east exit is to be removed. From a safety standpoint, fuel transports and delivery trucks would no longer be able to make safe deliveries, as their only option would be to back out onto the highway to exit. No longer could they pull through the canopy section and exit. Emergency vehicles,	Agree with you statement. Due to other constraints and alignment issues avoiding this impact was not possible.

Virtual Design Public Hearing Public Disposition of Comments

Arkadelphia Bypass Hwy. 67 – Hwy. 51

ARDOT Job 070442

Commentor	Comment Method	Comment	Response
		such as firetrucks would also be unable to safely enter or exit the property. Vehicles that are getting fuel under the canopy would have no option, but to back out into the only entrance /exit after fueling, causing an additional safety concern. If a traffic light is placed on the new intersection, westbound traffic would no longer have ease to enter our location. The turn lane could ultimately create congestion in front of the store. Based upon the location of this turn radius, we feel that this design would eventually destroy the business due to ingress and egress difficulties and safety concerns with only one entrance/exit.	
20. Jason Bright	Email	Since the bypass is going right thru my store, what information does ARdot need from me?	After ARDOT has the project FONSI approved by FHWA and design is complete, the department will begin Right of Way (ROW) negotiations with impacted land owners. At that point, ARDOT ROW will contact each land owner and start the process. They do not need any information from impacted property owners until that process begins. It is expected that this process will start next year. However, this timeline is preliminary and subject to change.
21. Jason Bright	Email	I am not a land owner, I just rent my building. Will I qualify for an eminent domain?	ARDOT does have a policy in place to compensate tenants as well as owners of properties, to relocate businesses and individuals who are renting.
22. Matthew Dalton	Phone call	Calling in regards about the bypass and hoping to speak with project staff about more project information.	Provided a contact and number with ARDOT ROW Division.
23. Mark Mc.	Phone call	Wanting to know about the road going downtown through Arkadelphia, when it is going to happen, and compensation as leaser of Napa Parts store.	ROW negotiation will be handled through ARDOT when they advance the project to ROW acquisition. The bypass is estimated to begin ROW acquisition in summer 2022.
24. Joe Burt	Phone call	They won't make the meeting the night of the event, but they are at the end of the bypass on 67 and is hoping for more information about the land that will be taken.	ROW negotiation will be handled through ARDOT when they advance the project to ROW acquisition.
25. Roger Wingfield	Phone call	Roger has property that will be affected and needs project staff to contact him.	The project team will look into providing access to the back of the property and having the access approved through ARDOT.
26. Don Smith	Phone call	He represents Littlefield Oil Company, which has a location at 3039 Pine Street in Arkadelphia. They are concerned about the project, and Mr. Smith has requested a call to discuss if there are any potential property impacts	Discussed possible impacts to property. Similar comment to Mr. Geels in comment # 19.
27. Johnnie Ward-Dunn	Phone call/Email	Ms. Ward called inquiring about the noise levels and requested a callback.	Several ARDOT representatives met with in person and talked with Ms Ward about her concerns.
28. Jenna Scott	Email	You addressed the issue with the I-30 exit to Pine Street, for those who are attempting to turn right, then left onto Professional Park	Relocating Professional Park Dr. further to the east and adding a signal at the Bypass/Pine St. intersection, which will

Virtual Design Public Hearing Public Disposition of Comments

Arkadelphia Bypass Hwy. 67 – Hwy. 51

ARDOT Job 070442

Commentor	Comment Method	Comment	Response
		Drive. You did not address the issue of attempting to turn left onto Pine Street from this exit. This is sometimes a huge issue. I have pulled off and seen long lines of cars attempting to turn left here. Why would you not merge Red Hill Road/Bypass with the exit and have ONE stoplight here? Still needs answered. 2. Clark County narrowly passed a tax and voted to issue bonds to support this project. We were promised that if we issued the bonds to fund our portion of the project, the project would be completed. Yet, we were left last night with no assurance that this would cover the cost of this project. They were unable to answer questions about funding, timing and prioritizing. There was not even a representative of ARDOT at the meeting to address the issues. It seemed that the representatives had more questions than we did. Can you please address these issues? Why should we issue bonds if you are unwilling to do as promised?	create stop conditions for west bound traffic on Pine St., providing the ability to make left turns from the Pine St. The east bound Exit ramp will be improved. Improvements to the ramp intersection will be studied in the future if warranted. ARDOT is anticipating the property acquisition will start in the summer 2022 for the Arkadelphia Bypass. The Pine Street widening project is estimated to start in the fall 2021. These dates are preliminary and subject to change.

Virtual Design Public Hearing Public Disposition of Comments

Arkadelphia Bypass Hwy. 67 – Hwy. 51

ARDOT Job 070442

Attached Exhibits:

- MAP COMMENT 1

Virtual Design Public Hearing Public Disposition of Comments

Arkadelphia Bypass Hwy. 67 – Hwy. 51

ARDOT Job 070442

- MAP COMMENT 2

Virtual Design Public Hearing Public Disposition of Comments

Arkadelphia Bypass Hwy. 67 – Hwy. 51

ARDOT Job 070442

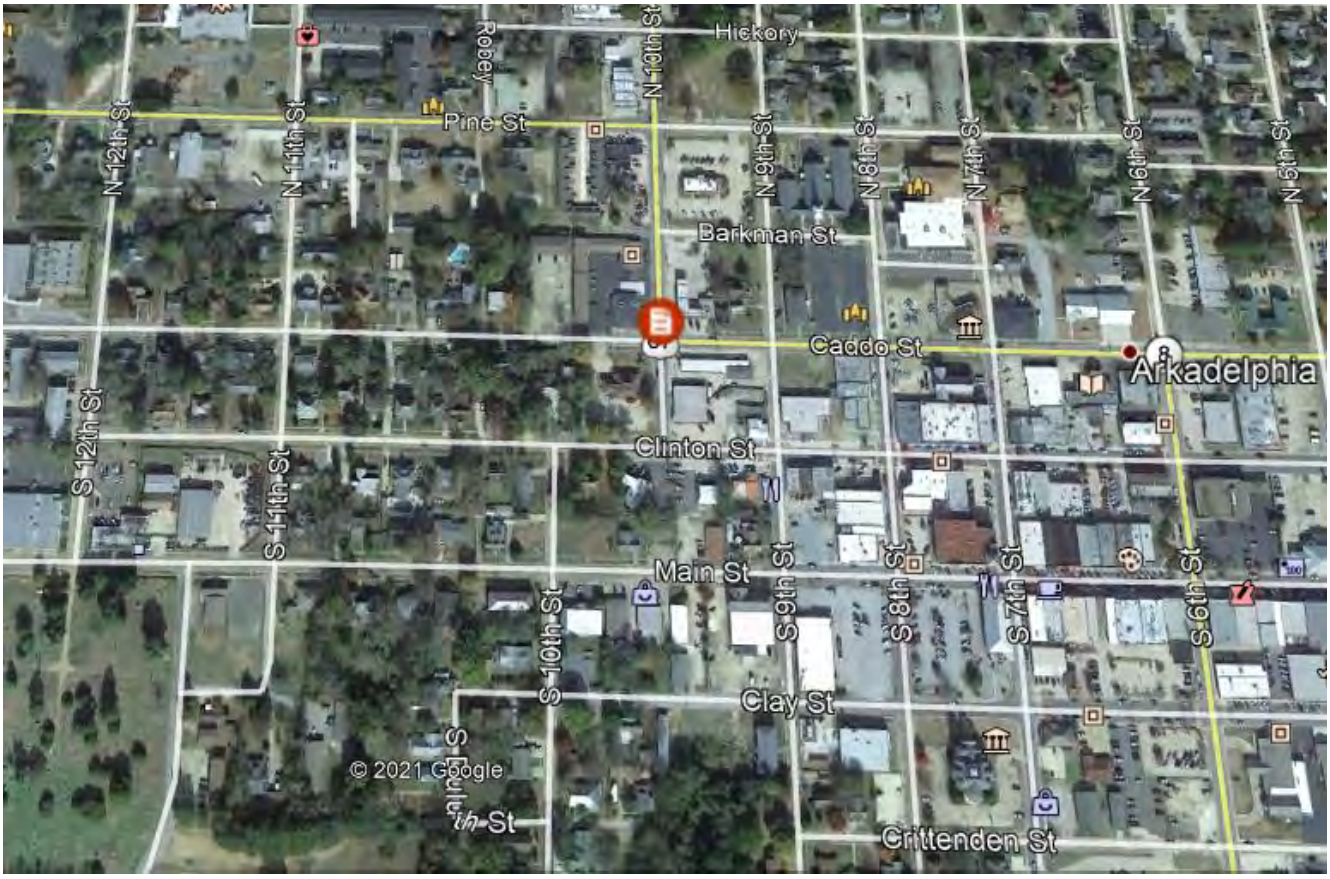
- MAP COMMENT 3

Virtual Design Public Hearing Public Disposition of Comments

Arkadelphia Bypass Hwy. 67 – Hwy. 51

ARDOT Job 070442

- MAP COMMENT 4



Public Involvement Synopsis

ARDOT Job Number 070442
Arkadelphia Bypass
Virtual Meeting with Live Event
October 18, 2020 – December 4, 2020

A Virtual Location Public Hearing was held to present the Arkadelphia Bypass Hwy. 67 – Hwy. 51 Connection Improvement Project in Arkansas.

The virtual meeting was held at ArkadelphiaBypass.TransportationPlanRoom.com and ArkadelphiaBypass.es.TransportationPlanroom.com in English and Spanish from Sunday, October 18 through Friday, December 4, 2020. A public officials meeting was held via video conference on Thursday, November 19, 2020. Additionally, a Virtual Location Public Hearing live event was held Thursday, November 19, 2020. Special efforts to involve minorities and the local community in the virtual public involvement meeting included the following:

- Legal ad published in the Arkansas Democrat Gazette on October 18, 2020
- Display ads placed in the Arkansas Democrat Gazette (November 1 and 15, 2020)
- PSA aired on Power 92.3 FM (3X daily November 16 through November 19, 2020)
- Postcards (155) mailed to attendees from the February 2019 public meeting
- Letters mailed to public officials
- Emails sent to public officials, agencies, stakeholders, and the public
- Social media blasts: ARDOT (October 30, November 2, 4, 10, 12, 16, 18, 19)
- News release published by ARDOT on November 5
- Notification/website link posted on ARDOT website

The live virtual public meeting was held on November 19, 2020 at 5:30 p.m. for one hour. The first 30 minutes consisted of a presentation, including the pre-recorded project video; instructions on how to submit comments, utilize Microsoft Teams, and navigate the virtual location public hearing website; and an overview of the alignment alternatives and intersection options using an interactive project map. The meeting followed with a live question-and-answer session between attendees and subject matter staff. Participants voiced their questions, comments, and concerns utilizing the Microsoft Teams chat function or by unmuting their device microphones.

Table 1 describes the results of the public participation at the virtual public meeting.

Table 1	
Public Officials Meeting (November 19)	**Totals**
Public Official Meeting attendees, including staff	15
Public Hearing Live Virtual Event (November 19)	**Totals**
Attendees, including staff	75
Virtual Public Involvement Meeting (October 18 – December 4)	**Totals**
Unique Visitors (New Users)	1,839
Visits to the Website (Sessions)	2,296
Number of Website Pages Viewed (Pageviews)	6,019
Percent of Total Users Interacting with Mobile Devices/Tablets	63%
Comment Forms or Letters Received	23
Comments on Interactive Map	12
Attendees who Signed Electronic Sign-in Sheet	58

Table 2 identifies the information available on the English virtual public meeting website and each page's number of views.

Table 2		
Website Page	**Pageviews (6,019)**	**Excluding Homepage (3,029)**
Homepage • Text: Information on the meeting's purpose, virtual meeting dates, a phone number for anyone with limited internet access or general questions or comments, submitting written comments, and guidance for special accommodations	50% (2,990)	
Meeting Registration • Electronic sign-in sheet	2% (126)	4%
Introduction Video • Recorded video presentation highlighting the purpose of virtual meeting and live event, the purpose of the project, project history and what has occurred since the February 2019 meeting, an overview of the bypass alternatives and intersection options, typical sections, and submitting comments. A pdf with the voiceover script was also available.	6% (348)	11%
Project Documents • Environmental Assessment and appendices; Public Hearing Packet; Project Summary Sheet; Project Bypass Alternatives; Interchange Alternatives; Typical Sections; Environmental Impacts Table; Environmental Constraints Map; and Right of Way Procedures for Acquisition	10% (580)	19%
Interactive Project Map • Link: ArcGIS corridor map on Street View showing the three west alignments, three east alignments, and four interchange alternatives, with the ability to leave comments on the map • Text: Instructions to use the interactive map	24% (1,470)	49%
Live Event Information • Link: Microsoft Teams Live Event Meeting • Text: Instructions to use the Microsoft Teams Application and how to attend the Live Event	5% (284)	9%
Submit a Comment • Print and electronic versions of the comment form	4% (220)	7%

Table 3 describes the results of the public participation at the Spanish virtual public meeting.

Table 3	
Virtual Public Involvement Meeting (October 18 – December 4)	**Total**
Unique Visitors (New Users)	6
Visits to the Website (Sessions)	13
Number of Website Pages Viewed (Pageviews)	32
Percent of Total Users Interacting with Mobile Devices/Tablets	67%
Comment Forms or Letters Received	0
Attendees who Signed Electronic Sign-in Sheet	0

Table 4 identifies the information available on the Spanish virtual meeting website and each page's number of views.

Table 4		
Website Page	**Pageviews (32)**	**Excluding Homepage (18)**
Homepage • Text: Information on the meeting's purpose, virtual meeting dates, a phone number for anyone with limited internet access or general questions or comments, submitting written comments, and guidance for special accommodations	44% (14)	
Meeting Registration • Electronic sign-in sheet	9% (3)	17%
Introduction Video • Recorded video presentation highlighting the purpose of virtual meeting and live event, the purpose of the project, project history and what has occurred since the February 2019 meeting, an overview of the bypass alternatives and intersection options, typical sections, and submitting comments. A pdf with the voiceover script was also available	31% (10)	56%
Project Documents • Environmental Assessment and appendices; Public Hearing Packet; Project Summary Sheet; Project Bypass Alternatives; Interchange Alternatives; Typical Sections; Environmental Impacts Table; Environmental Constraints Map; and Right of Way Procedures for Acquisition	3% (1)	6%
Interactive Project Map • Link: ArcGIS corridor map on Street View showing the three west alignments, three east alignments, and four interchange alternatives, with the ability to leave comments on the map • Text: Instructions to use the interactive map	3% (1)	6%
Live Event Information • Link: Microsoft Teams Live Event Meeting • Text: Instructions to use the Microsoft Teams Application and how to attend the Live Event	3% (1)	6%
Submit a Comment • Print and electronic versions of the comment form	6% (2)	11%

Garver staff reviewed all comments received and evaluated their contents. The summary of comments listed below reflects the personal perception or opinion of the person or organization making the statement. The sequencing of the comments is random and is not intended to reflect importance or numerical values. Some of the comments were combined and/or paraphrased to simplify the synopsis process.

Preferred Western Alignment	
Alignment A	6
Alignment B	9
Alignment H	4

Preferred Eastern Alignment	
Alignment D	10
Alignment F	2
Alignment G	4

Preferred Interchange Alternative	
Alternative 1	4
Alternative 1A	9
Alternative 2	2
Alternative 3	1

Summarized Comments

- 6 comments opposed Alignment H due to the anticipated cost and threat to relocate businesses/residences along the proposed route.
- Siplast formally rejects all truck bypass routes currently proposed by ARDOT.
- The Executive Director of the nonprofit, Equilibrium, said there is not a need for this project. Also called the project evaluation process into question.
- One commenter indicated that Alignment F appears to impact federal/state grant funded park site (River Park) and posed the concern that impacts to grant funded sites could require replacement of park land.
- Attendees to the public officials who attended the public officials meeting expressed support for Alignment H.
- Three commenters opposed Alignment D due to the threat to relocate businesses/residences along the proposed route.
- One commenter opposed alignments F and G.
- Two commentors opposed Alignment A.
- One commentor opposed Alignment B.
- One commentor opposed Interchange 1 due to the threat to relocate businesses and residences along and the threat to a potential loss of revenue.

Comments received by those representing:	
Self / Did Not Specify	35
Agency/Organization: • Equilibrium of Arkadelphia, Siplast, Grace Fellowship Church of Christ, Lucky Liquor of Arkadelphia, Boyers Auto, Red River Baptist Association, Lighthouse Ministries and RRBA Disaster Relief, Clarks Napa & Ron Tropf Parts Warehouse, The Ross Foundation, Chamber of Commerce, Tate's Electric, City of Arkadelphia, Cutway Logging Inc., Rosegail Leatherberry, Law Firm Properties, StewArts Auto, Arkadelphia Lions Club, Williams Funeral Home	23

Attachments:

- Screenshots of virtual public meeting site
- Presentation Transcript
- Small-scale display maps and exhibits
- Website analytics report
- Copies of sign-in sheets and submitted comment forms
- Outreach documents

Virtual Location Public Hearing Public Disposition of Comments

Arkadelphia Bypass Hwy. 67 – Hwy. 51

ARDOT Job 070442

Commentor	Comment Method	Comments	Response
1. **Mark G**	Interactive Map (-93.071, 34.10756)	This alternate seems to be passing basically through the backyards of many households. A routing further south, hewing more closely to the Siplast plant would alleviate some of this. [Alignment A]	The alignment was shifted as far as possible to the south onto Siplast property.
2. **Chad Hause**	Interactive Map (-93.0889, 34.1181)	Alt 1 is the most disruptive and expensive options presented. It displaced the most businesses and residents. Will cause the loss of revenue to the city from property taxes, and sales taxes. I am against this option	Thank you for your comment.
3. **Chad Hause**	Interactive Map (-93.0917, 34.11671)	Alt 2 appears to be the least disruptive to the community and a less expensive option.	Thank you for your comment.
4. **Chad Hause**	Interactive Map (-93.0882, 34.11237)	Alt A leads to only 1 intersection option which is the most disruptive and expensive option. I am against this option.	Thank you for your comment.
5. **Chad Hause**	Interactive Map (-93.0923, 34.10708)	Alt B is a reasonably cost effective option and leaves multiple options at the intersection.	Thank you for your comment.
6. **Lori Copeland**	Interactive Map (-93.0914, 34.11912)	Can you explain this circular shape and how it affects traffic and log trucks and access to the hospital? [Alternative 3]	The intersection configuration is not determined, it could be a roundabout or a stop sign or stop-light intersection, this decision will be made during final design and based on traffic projections and safety.
7. **Lori Copeland**	Interactive Map (-93.1004, 34.10397)	Yes, we like this one. Easy accessibility for trucks. Also, when I-30 is closed or slow, it is helpful to have direct access for traffic to get from I-30 to 67 without going through town. [Alignment H]	Thank you for your comment.

Virtual Location Public Hearing Public Disposition of Comments

Arkadelphia Bypass Hwy. 67 – Hwy. 51

ARDOT Job 070442

8. **Lori Copeland**	Interactive Map (-93.0573, 34.11902)	This plan cuts off downtown from the rest of the community. Many pedestrians frequent both sides of this proposed road. Downtown is on one side and the elementary school is on the other side. [Alignment D]	Thank you for your comment.
9. **Lori Copeland**	Interactive Map (-93.0598, 34.1107)	This is a funny shape. Will it be a large interchange or a stop light? Will the green road go over 67 and then turn to meet it? [Intersection of alignments A & F]	The intersection configuration is not determined, it could be a roundabout or a stop sign or stop-light intersection, this decision will be made during final design and based on traffic projections and safety.
10. **Joseph E Burt**	Interactive Map (-93.0579, 34.1106)	I am concerned that the surveyors were working with measuring our property at 905 Hwy 67 and saying this was a new route. We currently operate a thrift store, and food pantry, feeding many in Clark County and Surrounding areas. This is not a good option [Alignment F]	Thank you for your comment.
11. **Randy Roberson**	Interactive Map (-93.0474, 34.11966)	Alt F appears to impact fed/state grant funded park site (River Park). Land and Water Conservation Fund grant and Arkansas Matching Grant funds were used to improve park property. Impacts to grant funded sites could require replacement of park land.	Thank you for your comment.
12. **Troy Hogue**	Interactive Map (-93.0541, 34.10729)	Will the proposed routing north of the airport impact the instrument approach minimums for runway 22? If so, how can that be mitigated so as not to impact approach minimums? And if not, how much leeway is between the proposed route and the IAP corridor?	Airport requirements were considered in the location of the alternatives. Airport activities will not be impacted.
13. Harold Johnson 870-403-3033	Online Comment Form	I am the Unit Director of the Red River Baptist Association Disaster Relief Team located at 905 Hwy 67 So in Arkadelphia, also the location of Lighthouse Ministries and the Red River Baptist Association office complex. A review of the interactive map shows the bypass north edge at or near our south property line. This location presents no problem for us. However, this week a survey crew told us that you would be taking our property up to or near the 18-foot concrete parking apron extending along the south side of the building. This action would leave the building unusable. The disaster relief team has a bus, 3 trucks, and 5 trailers that deploy trough	The right of way is required for the future 5-lane section and bridge over Hwy 67. However, the ultimate 5-lane section and the bridge over Hwy. 67 construction is not warranted and could be many years until it is. until that ultimate build out is needed the impacts to this property will be much less.

		out the eastern and central parts of our nation would no longer be able to function from this building. One trailer is 34 feet long, and its tow vehicle extends its length to well over 40 feet. It and the other vehicle cannot enter/exit the building via an 18-foot corridor. We receive food shipments from Sysco Arkansas in 18 wheelers. Lighthouse receives food from Arkansas foodbank in large trucks. Many of their clients and donors make deliveries and collections using trailers. They also need room for parking on a daily basis. The disaster relief team needs long-term parking for its personnel when deployed. If some of our property must be taken, it should end at or near the drainage ditch that crosses the property west to east near the center of the grassy area. The minimum that we can get by with is the area within 60 feet of the building. Please let me know immediately what is planned that would affect us.	
14. Ashley Clark	Mailed Comment Form	Option D makes no sense and would destroy a part of downtown that's full of small businesses	Thank you for your comment.
15. Taylor Chaney 870-230-7743	Online Comment Form	Building a bridge either over the train tracks or the river aren't financially feasible on the east side. Alternative D is the only feasible option. The bang simply isn't worth the buck for Alternative F and G. Additionally, putting a stoplight at 1st and Caddo for Alternative F is not a feasible option. However, the benefit may justify the expense on the west side for Alternative H. It just depends on how much ArDOT is expecting from Clark County. I would like to be notified of those figures at your earliest convenience. Regardless of which alternative is chosen on the west side, having our southern onramp moved south from its present location is extremely important for us to unlock the commercial benefits of our Interstate access. So if not Alternative H, then Alternative B on the west side.	Thank you for your comment.
16. Dylan Clark	Email	Hello, my name is Dylan Clark. I own "The Olde Rose Tattoo" which is located at 904 main street, here in Arkadelphia. January of 2021 will mark our 4th year at this location. We signed our lease agreement in this location in hopes of it being where we were located for years to	Thank you for your comment.

		come. This location has benefited us in so many ways and we are very happy here. I am really, really hoping the AR department of transportation decides against the route that comes right through KFC, Napa, Italian Villa, Clark County Porlarole/Probation services, a church, plus various other businesses. I personally feel that downtown Arkadelphia has had enough obstacles to conquer as is. I know what type of hardship it would cause for myself, and my own business; much less the businesses that surround my location. We are already facing hardship with the increasing challenges Covid-19 has presented to us. This is only another blanket of pressure for the small business owners that would be affected by the bypass forcing us to uproot and relocate. We have tens of thousands of dollars invested, much less the hours of labor to make it all happen with our own ambitions and dream. I understand that ultimately the public discussion is just that, public discussion. In the end ARDOT will do what ARDOT wants to do. But, I, like the other business around, pay taxes that helps fund what ARDOT does. I have discussed the topic at hand with every surrounding business and I havent had a single one of them say they're in favor of this proposal. Frankly we are afraid of what will happen to our livelihood if we are forced to move. This email is probably a complete waste of my time. But a guy has to try. If you have made it this far, I appreciate your time and hope you will consider a route that is less detrimental to small business owners like myself.	
17. Bill R. Alexander 870-210-0648	Online Comment Form	My wife and I live at the corner of Redhill Road and Meadowlark Drive. We are both opposed to Alternate H on the west end due to (1.) the impact on many of our neighbors and a church, (2.) the fact that trucks needing to go from 8 to 26, or 26 to 8 would have to use the difficult to navigate 8/26 y intersection in front of Allen's Barbeque, and (3.) the tremendous cost of constructing a new overpass and exit/entrance	Thank you for your comment.

Virtual Location Public Hearing Public Disposition of Comments

Arkadelphia Bypass Hwy. 67 – Hwy. 51

ARDOT Job 070442

		ramps. It seems that tax money could be better spent elsewhere.	
18. Randy Stewart 870-245-8547	Online Comment Form	Do you have a projected start date?	
19. Fred Smith 310-503-6146	Email	Hi, when will the department select their preferred West bypass alternative option (A,B,H) and how can I find out what the decision is?	11/29 - ARDOT will review the comments received from citizens, public officials, and public agencies and a decision on the preferred Alternative, which will include a western bypass, will be made before the end of the year. The best way to stay connected with the project is to continue to follow our website, arkadelphiabypass.transportationplanroom.com and ardot.gov for updates concerning this project, ARDOT Job No. 070442. Please don't hesitate to reach out to us again if you have any additional questions.
20. **Fred Smith**	Email	Are you able to share the current recommendation alternative for the west bypass, I understand it is under review and going through the public comment phase and the final decision may change.	12/1 - Currently, there is no official recommended western bypass alternative for the project as it is still going through the process of receiving public comment. Please let us know if you have any additional questions that we can help you with.
21. Jason Bright Lucky Liquor	Live Event Comment	What is the anticipated timeline for the project?	Right of Way acquisition is anticipated to start in the summer of 2022. That date is subject to change.
22. **Jason Bright Lucky Liquor**	Comment Form	I own an established business in Arkadelphia on Pine Street, Lucky Liquor of Arkadelphia. Established in 2011, Lucky Liquor is the first legal Liquor store in Arkadelphia since the 18th Amendment, also known as Prohibition (1920). My Business has to adhere to very specific guidelines for it's location of business, specifically distance away from schools and churches. I feel that my business does provide benefit to the community. I understand a	Thank you for your comment.

		project of this magnitude will permanently affect families, homes, businesses, traffic patterns, wildlife, etc. I understand that there will be many people that will both support and object to this project. I only ask The Powers That Be, to consider plans that affect the least amount of churches, business and homes with higher priority. My business can be moved if necessary, but it requires considerably more "leg work" to relocate. Thank you for taking public input. Best Wishes Jason L Bright OD	
23. David Tate Property/ Tate's Electric Business Owner	Live Event Comment	Mr. Tate voiced that he owns property on Red Hill Road across from the church and owns Tate Electric. Alternative H would impact him personally and professionally, and he is publicly opposed to this alternative.	Thank you for your comment.
24. Elaine Cox Mobile Home Manor Owner	Live Event Comment	Ms. Cox inquired about how Alternative A will impact the mobile home park and if residents would be helped with moving expenses upon acquisition if this alternative were to be chosen.	Yes owners and renters required to relocate will receive assistance from ARDOT to compensate those expenses.
25. Marc G.	Live Event Comment	Marc asked about the connection between the east and west bypass alternatives. Specifically, Marc asked about why the intersection is not farther south and closer to Siplast.	Airport operations restrict the opportunity to align the roadway farther to the couth.
26. Tom Curry	Live Event Comment	Tom asked if Alternative D might be adjusted and if it could potentially shift farther west and impact his building.	This alignment shift will be considered.
27. Dan Devun	Live Event Comment	There is no alternative for the bypass location itself? All alternatives follow the same A,B,H corridor? Will you look into alternative routes for east west traffic?	To locate the bypass sections referred to they would have to be located considerably south of the airport creating a very long connection and taking drivers out of their way reducing the benefits of the bypass.
28. Joy Valdez	Live Event Comment	If alt D is not chosen, will loggers still be going down 10th regularly or will it reroute them?	They will continue to use an improved 10th Street that will be renamed Highway 67.
29. Joe Burt	Live Event Comment	My location is just North of the green stripe going over 67. So if your doing 200' how much of our property will be impacted?	Additional design will be required to answer this question. Another hearing will be held once sufficient design is complete.

Virtual Location Public Hearing Public Disposition of Comments

Arkadelphia Bypass Hwy. 67 – Hwy. 51

ARDOT Job 070442

30. Tom Curry	Live Event Comment	Do the maps show the entire right of way of just the road as paved?	Entire ROW.
31. Chuck	Live Event Comment	-For the east bypass options, which city streets that are crossed will have access to the bypass? - Follow up. For Alternative F, will Hemphill Rd and/or Walnut St have access to the bypass?	Alts E and F – Clinton, Clay, Hemphill, Walnut St, and 3rd St Alt G – Hemphill, Radio Station and 3rd St
32. Caroline Reed	Live Event Comment	Did you record the meeting you had with community leaders earlier today and if so, will the public have access to those meetings so that we can hear the feedback the community members gave? Additionally, will this session be available for people who were not able to attend?	The recording of the Live Event Public Hearing was uploaded to the project website.
33. Dan Devun	Live Event Comment	These alternatives seem to primarily address interchanges. Are you required to look at additional alternatives for the east west traffic?	Numerous east-west bypass alternatives were considered and studied.
34. Tiffany Burke	Live Event Comment	Is ARDot is leaning toward one alternative over the other?	No
35. Grace Fellowship Church	Live Event Comment	We are Grace Fellowship on Red Hill Rd. It looks like alternate H directly impacts our church. If you choose that route, what kind of time frame are we looking at for relocation?	Row acquisition and relocation can often take 1 to 2 years. It varies a lot and case by case.
36. Joe Burt	Live Event Comment	For the last week you have had alot of surveying going on 67 by other businesses. Specificly the Red RIver Baptist Association are you looking at that property, and why have you not contacted owners?	We have notified owners by mail and flyer of the public meeting opportunities so they can raise questions and provide comments.
37. Nikki Tate	Live Event Comment	How do you determine which route to go with?	How each alternative meets the project goals while minimizing the negative impacts to the greatest extent possible is evaluated along with public and local official input to identify the preferred alternative..
38. Taylor Chaney	Live Event Comment	We committed $8 mil toward this project several years ago. What are the changes in that figure per alternatives?	These alternatives do not impact that commitment.

Virtual Location Public Hearing Public Disposition of Comments

Arkadelphia Bypass Hwy. 67 – Hwy. 51

ARDOT Job 070442

39. Randall Turner 870-246-9223	Online Comment Form	This is a project with potential benefits. We seem to be the only community around without a bypass. I really like Alt H as it takes traffic from the busy intersection and along with Alt 3 makes access to Baptist Health much better. The current interchange is a problem as I navigate it every day.	Thank you for your comment.
40. Laura Pierce	Online Comment Form	I agree with a by pass from 67 to 51. But to ttear down business and move people from there homes on pine street in arkadelphia is not the solution. I think the options for that is too costly.	Thank you for your comment.
41. **Jo Elaine Cox**	Online Comment Form	I believe that combining Alt A for the West and Alt D for the East will be the most economical and best traffic flow for the Bypass. However; Alt F for the is a good alternative from the East.	Thank you for your comment.
42. **Laura Arnold**	Online Comment Form	I THINK ITS A WASTE OF THE CITY OF ARKADELPHIA TO COME THRU PINE STREET AND TAKE OUT BUSINESSES AND HOMES FOR A BY PASSTHAT WOULD MAKE THAT AREA A GHOST TOWN	Thank you for your comment.
43. Tracy Rider	Online Comment Form	I think any of the other alternatives are pointless. I think we NEED D and H. If there is any hope of saving our town!!	Thank you for your comment.
44. Nikki Tate	Online Comment Form	NO to Alternative H!	Thank you for your comment.
45. Jamie Gordon	Online Comment Form	No to alternative H	Thank you for your comment.
46. Megan E. Bedell Real Estate Counsel for Siplast, Inc. and GAF Materials LLC	Email/Mail	Dear Ladies and Gentlemen: I am real estate counsel to Siplast, Inc. ("Siplast") and GAF Materials LLC ("GAF"). Siplast and GAF are part of Standard Industries, which is a global building materials company whose businesses range from the world's largest roofing and waterproofing business to aggregates, insulation, and solar energy solutions. Siplast manufactures highly-engineered commercial roofing materials that serve the needs of building owners, roof consultants and architects. Siplast operates two plants within Clark County, Arkansas: a roofing membranes plant located at 1111 Highway 67 ("Subject Property") and a	

		roofing coatings plant in Gum Springs. Siplast employs more than seventy (70) people combined at the two plants. The products produced by Siplast at its Arkadelphia and Gum Springs facilities are distributed worldwide and are included on the roofs of national and international treasures such as the Library of Congress and the Louvre Museum. **BACKGROUND AND OBJECTION:** Siplast has learned that the Arkansas Department of Transportation ("ARDOT") intends to construct a truck bypass route around the Arkadelphia Central Business District that is intended to connect Highway 51 to Highway 67. Routes A, B, and H as shown on ARDOT's interactive map for the project (collectively, "Western Routes") enter the western (rear) portion of the Subject Property very close to Siplast Road, which is the employee entrance to the facility, and then continue northeast across the Subject Property (passing near Siplast's employee parking lot) and connect with Routes F and Gas shown on ARDOT's interactive map for the project (collectively, "Eastern Routes"). Please be advised that each of the proposed routes adversely affects the Subject Property as discussed in more detail below. Siplast hereby objects to the routes and requests that ARDOT evaluate an alternate route to the south of the Subject Property. **NEGATIVE IMPACT ON FUTURE DEVELOPMENT:** The Western Routes would bisect the currently undeveloped portion of the Subject Property, which would severely constrict, if not entirely prohibit, Siplast from expanding its operations on the Subject Property in the future as that land is the only remaining developable portion of the Subject Property. Similarly, the Eastern Routes would limit expansion options and decrease our frontage along Highway 67. Each of the Western and Eastern Routes would result in an oddly shapred remaining portion of land that would likely be undevelopable. **SAFETY CONCERNS:**	

		In addition to depriving Siplast of its ability to expand its operations on the Subject Property, the proposed routes create safety concerns for Siplast. In order to properly secure the active manufacturing facility, the Subject Property is fenced and constitutes one contiguous parcel of land. The proposed routes bisect the Subject Property thereby making the Subject Property more difficult and costly to monitor and secure. Additionally, Siplast is worried about the safety of locating a two-lane road (with the apparent ability to expand to five-lanes in the future) near its active manufacturing. **COST IMPLICATIONS:** Furthermore, the Western Routes appear to travel through an approximately sixty (60) foot high – ten (10) acre refuse pile located on the Subject Property. The refuse pile presents an obstacle to making the land road-ready and we would expect it to cost many millions of dollars to relocate. **ALTERNATIVE POTENTIAL ROUTE:** Siplast also requests that ARDOT evaluate or re-evaluate locating the bypass to the south of the County Fair Association property (which is located directly south of the Subject Property). Such an alternate route could potentially utilize parcels already owned by the State Highway Commission that front on the Highway 67 south of the Subject Property. **SUMMARY:** For the foregoing reasons, Siplast objects to each of the truck bypass routes currently proposed by ARDOT. I am happy to organize a virtual meeting with representatives of Siplast and ARDOT to discuss these matters further.	
47. Daniel DeVun	Email/Mail	Please accept my comments pertaining to the Arkadelphia Bypass. **Previous Studies** Until recently, previously published studies indicated a need for improved intersections, not a need for bypass.	Thank you for your comment.

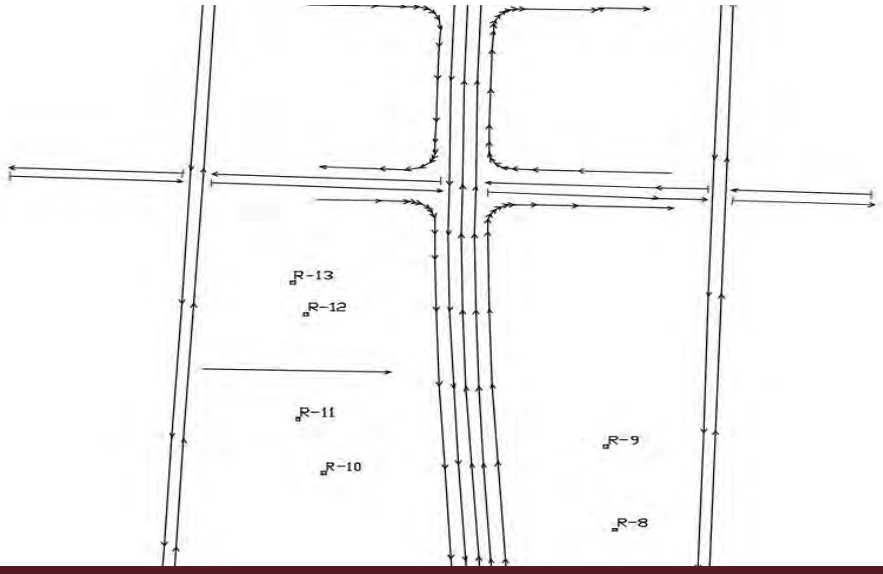
		The 2013 Arkadelphia Bypass Study identified existing and projected traffic volumes, as well as current traffic distributions. Based from the study's findings; with an exception of traffic on West Pine Street and I-30, an average increase of 11% in average daily traffic volumes across Arkadelphia and the study area are expected in 2033, representing an additional 620 vehicles per day from 2013 values. Additionally, the 2010 Highway Capacity Manual analyzed traffic operations on state highways and how they function in the city transportation network. It concluded; in Arkadelphia, "no state highways are expected to reach unacceptable conditions within the study period, traffic problems in Arkadelphia result from large trucks maneuvering through intersections with inadequate turning radii, and are not due to high overall traffic volumes" (Arkadelphia Bypass Study, 2013). The same study projected only a slight increase of Arkadelphia's traffic in 2033. Additionally, ARDOT concluded from Level of Service analyses that "While some congestion does exist on several routes in Arkadelphia, no state highways are expected to reach unacceptable conditions within the study period." These findings do not warrant the construction of a new east – west bypass south of the town. Furthermore, the Arkadelphia Bypass Study included data obtained from an origin – destination survey on July 17th and 18th, 2012; which identified the destination of vehicles crossing the Highway 51 Ouachita River Bridge. During those two days, 17% of both passenger cars (450 vehicles) and single unit trucks (10 vehicles) traveled from the river bridge to I-30 and west, while only 5% (10 vehicles) of the tractor trailers made the same voyage. This indicates most vehicles crossing the bridge have destinations within, north and/or south of Arkadelphia; not to I-30 and west of Arkadelphia. Currently, allocations of money have been made to widen Pine Street and construction is expected to begin soon. This widening project will eventually reduce travel time from east to	

		west and is being designed to handle the expected future volumes of traffic. The recently published (September 2020) Environmental Assessment calls for the purpose of this project to reduce logging trucks traveling through Arkadelphia, to improve safety, to reduce traffic congestion and to improve emergency vehicle access to the hospital. However, it also states previous studies were prepared at the request of the City, the EA includes multiple remarks concerning the City's desire for future growth, and it is known the City has committed millions of dollars of matching funds for the project. However, Arkadelphia's population has not significantly grown in decades, the EA points out Arkadelphia has maintained a flat population curve. Previously, it was recorded due to the potential construction of a pulp mill, a bypass was needed. Projects to this magnitude should not be planned or built from such speculation or to satisfy personal inconveniences. **Requirements** It is understood the EA is required to conduct a social, economic, and environmental effects of the proposed alternatives and to address cumulative impacts. I applaud your efforts in attempts to meet these requirements and others associated with NEPA. It is apparent your efforts have been developed specifically for those reasons. However, you have not addressed the accumulative economic impacts of the project. Yes, you report the cost of each alternative, but other than project costs, I have not found where you report potential positive or negative impacts to the local economy. Bypasses are designed to route traffic flow away from cities, to fully assess the impacts from the proposed project, it is necessary to assess its economic growth or negative growth potential. Numerous studies cite construction of bypasses result in significant economic losses for towns. Arkadelphia struggles enough, eliminating thru traffic could potentially exacerbate such hardships.	

		It is known that reasonable alternatives shall be considered in the EA process. Each identified alternative in this project utilizes a portion of the same route (approximately 1.5 miles) to connect traffic from east of town to west of town. More specifically, there is only one proposed route between HWY 67 to 26th Street. Consideration of alternative routes can provide more in-depth assessment opportunities. Understanding if a FONSI is issued for this project, further alternative assessment is not required because you have selected at minimal two alternatives, including the required No Action Alternative. However, if by a slim chance the FHWA is to identify significant, unmitigable impacts and an EIS is recommended; alternative selections may be considered in more depth. "Although an agency must still give full and meaningful consideration to all reasonable alternatives in an environmental assessment, the agency's obligation under NEPA to discuss alternatives is less than in an EIS." Western Watersheds Project v. Abbey, 719 F.3d 1035, (9th Cir. 2013) Therefore, alternatives to this one and only route should have been considered to this project. Thank you for accepting my comments as part of your required solicitation of public comments to the Arkadelphia Bypass. Although, I do not accept your justification of this project or agree with these alternatives; I do hope your matrixes truly weigh the cumulative social, economic, and environmental impacts of this project, that your alternative selection is the most appropriate for the community, and that your decisions are based on sound science including accurate population models and project needs. This project will impact present and future generations; most importantly, please consider those in your decision-making processes.	
48. Barbara Niven	Mailed Comment Form	Regarding: Arkadelphia Bypass, Comment Dear Mrs. Miller Attached you will find a copy of my comments submitted in February 2019. My concerns continue, most specifically pertaining to alternative routes A, B, and H referenced as West Alignment.	Thank you for your comment.

		I was in attendance of the virtual public hearing on November 12, 2020. I, now, have even more concerns with the routes A, B and H due to the fact that all three are the same proposed route. The differences concern the interchanges. I believe that this was noted during the questions and answers and the response from the committee was that the questions was not understood. How can that be justified as "proposed alternative route" when it is the identical route? It was also questioned as to why the bypass could not be moved south of the airport. That would seem to be the most logical route that there already is an exit/interchange to and from I30 which connects to Highway 67 (Gum Springs Exit). I feel that this project is an abuse of tax dollars. Thank you for allowing the opportunity to comment on this project.	

Appendix B – Traffic Noise Assessment Study



Traffic Noise Assessment

Hwy. 67 to Hwy. 51 (Arkadelphia Bypass) P.E.
ARDOT Job No. 070442, FAP No. STPC-9013(10)
Arkadelphia, Clark County, Arkansas

Prepared For:

Arkansas Department of Transportation

May 10, 2021

GARVER
GarverUSA.com

Table of Contents

Table of Contents 1
List of Tables 2
List of Figures 2
List of Appendices 2
1.0 Executive Summary 3
2.0 Project Description and Noise Assessment Areas 5
2.1 NAA 1 5
2.2 NAA 2 5
3.0 Criteria for Determining Impacts 5
3.1 Traffic Noise Terminology 5
3.2 Noise Abatement Criteria (NAC) 6
4.0 Identification of Noise-Sensitive Land Uses and Noise Study Areas 7
5.0 Determination of Existing Sound Levels 8
6.0 Future Sound Levels and Impact Determinations 9
6.1 Traffic Data 9
6.2 NAA 1 10
6.3 NAA 2 11
6.4 Impact Determinations 11
7.0 Noise Abatement Evaluation 12
8.0 Construction Noise 12
9.0 Information for Local Officials 12
10.0 References 13

List of Tables

Table 1 – Federal Highway Administration Noise Abatement Criteria (NAC) 7
Table 2 – Model Validation Measurements 9
Table 3 – Noise Model Traffic Volumes 10
Table 4 – Results Summary 11
Table 5 – Noise Contour Impact Zones 13

List of Figures

Figure 1: Project Area 4

List of Appendices

Appendix A: Noise Study Overview Land Use Exhibits

Appendix B: Roadway Typical Section Data

Appendix C: Noise Measurement Data Sheets

Appendix D: Photographs

Appendix E: TNM Data

1.0 Executive Summary

This traffic noise assessment examines the potential noise impacts to a proposed Highway 67 bypass through and around the City of Arkadelphia and specifically associated with Preferred Alternatives B, D and 3 as identified in the Environmental Assessment (EA) prepared for the project and shown in **Figure 1**. Alternative B will be referred to as proposed Highway 51 and Alternative D will be referred to as proposed Highway 67. Potential alignment alternatives were screened with a tiered process outlined in the noise screening analysis completed for the EA. As a result of potential traffic noise impacts identified in the screening process associated with portions of proposed Highways 51 and 67, detailed evaluation is required. Additional information pertaining to these alternative alignments can be found in the EA. **Appendix A** depicts the Preferred Alternative portions evaluated in this noise assessment.

Results of the screening noise analysis for proposed Highway 51 indicated potential impacts to one noise-sensitive receptor at the south end of S. 13th Street. Therefore, this detailed traffic noise assessment focuses on this area of potential impacts and extends east from approximately 1,500 feet west of the S. 13th Street on new alignment to existing Highway 67.

Results of the screening noise analysis for proposed Highway 67 indicated potential impacts to eight noise-sensitive receptors located between Walnut Street and Caddo Street. This detailed traffic noise assessment focuses on the area of potential impacts that are located between Walnut Street, Caddo Street, S. 10th Street and S. 9th Street. This alignment alternative crosses Clinton Street, Main Street, Clay Street, and Walnut Street.

This traffic noise assessment was performed using the Federal Highway Administration's (FHWA) computer model Traffic Noise Model (TNM) version 2.5 and complies with the Arkansas Department of Transportation (ARDOT) Policy on Highway Noise Abatement (ARDOT Noise Policy) dated September 13, 2018. ARDOT's Noise Policy was developed in accordance with requirements of the FHWA Noise Standard at 23 Code of Federal Regulations Part 772.

The land uses within the project extents contain commercial and residential properties as shown in **Appendix A**. The noise-sensitive land use within the project corridor is residential dwellings. The commercial properties within the project extents were not noise-sensitive and were therefore not studied for noise-related impacts. Based on field inspections, aerial maps, and 30% conceptual design plans, ten (10) model receivers (R-1 and R-2, and R-8 through R-15), representing twelve (12) receptors were analyzed.

The existing conditions were modeled utilizing 2018 traffic data and represent the baseline data for comparison to the future model evaluated for this project. Based on the future traffic volumes for the proposed highways, no receivers will approach or exceed the 67 dB(A) Leq(h) for NAC Category B, and no receivers will be impacted by substantial increase of 10 dBA or more as defined in the ARDOT Noise Policy. As a result of no anticipated impacts to noise-sensitive receptors, noise mitigation is not proposed for this project.

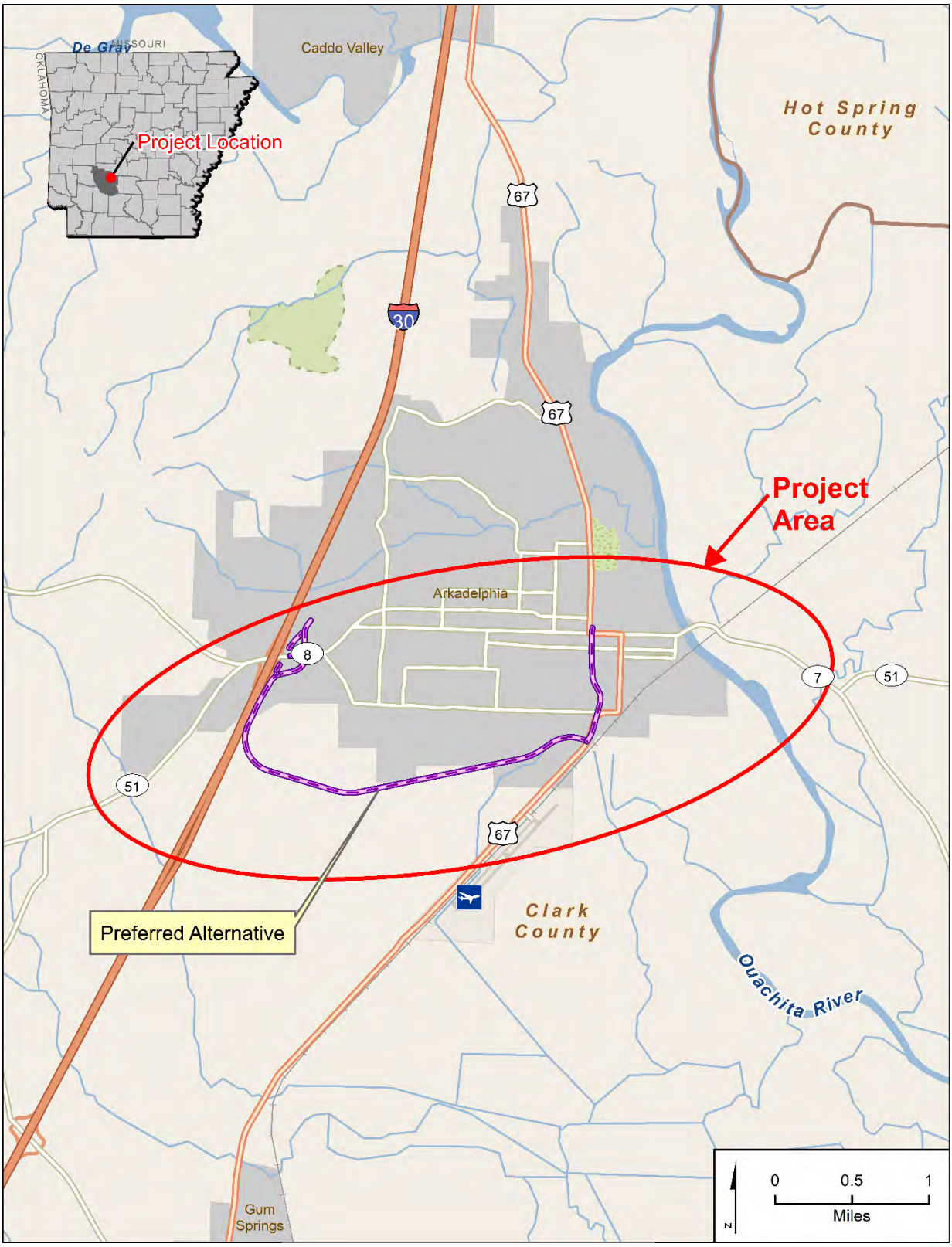


Figure 1: Project Area

2.0 Project Description and Noise Assessment Areas

This Traffic Noise Assessment Report examines the potential noise impacts associated with the Preferred Alternative, which would become Highway 67 through Arkadelphia and Highway 51 around the south side of Arkadelphia. The proposed improvements are located within and outside of existing ARDOT right-of-way. The two noise analysis areas (NAAs) were developed to encompass noise-sensitive receptor groups identified for further review in the screening analysis and are shown in **Appendix A**. Noise-sensitive receptors in these NAAs are identified in this section and include single and multi-family residences.

2.1 NAA 1

NAA 1 includes the residences on the southern end of S. 13th St. near the proposed improvements as shown in **Appendix A**. This highway section will be referred to as Highway 51 in this NAA. The proposed improvements are on a new alignment and have a cross-section of two 12' wide travel lanes with 8' wide shoulders as shown in **Appendix B**. Highway 51 would extend from existing Highway 67 to Pine Street near its interchange with Interstate 30 as identified in the EA and has a design speed of 60 mph.

2.2 NAA 2

NAA 2 includes the residences near the proposed improvements in the area between Caddo Street to the north, Walnut Street to the south, S. 10th Street to the west, and S. 9th Street to the east as shown on **Appendix A**. This highway section will be referred to as Highway 67 in this NAA. The proposed improvements are on a new alignment and have a cross-section of two 12' travel lanes, a 12' center left turn lane with curb and gutter, and five-foot sidewalks as shown in **Appendix B**. This section of Highway 67 would extend from Caddo Street to the proposed intersection of existing Highway 67 as identified in the EA and has a design speed of 45 mph.

3.0 Criteria for Determining Impacts

3.1 Traffic Noise Terminology

Noise is defined as unwanted or undesirable sound. The three basic parameters of how noise affects people are summarized below.

Intensity is determined by the level of sound expressed in units of decibels (dB). A 3 dB change in sound level is barely perceptible to most people in typical outdoor settings. However, a 5 dB increase presents a noticeable change and a 10 dB sound level increase is perceived to be twice as loud. Outdoor conversation at normal levels at a distance of 3 feet becomes difficult when the sound level exceeds the mid-60 dBA range.

Frequency is related to the tone or pitch of the sound. The amplification or attenuation of different frequencies of sound to correspond to the way the human ear hears these frequencies is referred to as "A-weighting." The A-weighted sound level in decibels is expressed as dBA.

Variation with time occurs because most noise fluctuates from moment to moment. A single level called the equivalent sound level (Leq) is used to compensate for this fluctuation. The Leq is a steady sound level containing the same amount of sound energy as the actual time-varying sound evaluated over the same time period. The Leq averages the louder and quieter moments, but gives more weight to the louder moments.

For highway noise assessment purposes, Leq is typically evaluated over the worst 1-hour period and written as Leq(h). The Leq(h) commonly describes sound levels at locations of outdoor human use and activity and reflects the conditions that will typically produce the worst traffic noise (e.g., the highest traffic volumes traveling at the highest possible speeds). Traffic noise analysis consists of a comparison of physically measured or modeled noise levels for the existing condition with projected noise levels for the future condition. The analysis was performed using the FHWA's Traffic Noise Model version 2.5 (TNM 2.5) to model existing and future noise levels based on traffic data, roadway geometry, and receptor sites.

A **receiver** is a discrete point modeled in the TNM program at areas of frequent human use of a property. A **receptor** is defined as a representative location of a noise sensitive area for various land uses. For the purposes of the noise screening, receivers are incrementally placed away from the roadway centerline to determine the distance to which impacts extend. The model assumes that the roadway and receivers were located at the same elevation with no intervening barriers such as topography or dense vegetation. Receptors may be placed in the front or back yard of single-family residences. TNM receivers may be representative of several receptors where common noise environments exist. Conceptual plans developed in February 2021 were utilized for TNM modeling. Refer to **Section 6** for a discussion of the traffic data.

3.2 Noise Abatement Criteria (NAC)

The FHWA has seven noise activity categories based on land use and sound levels, each of which has its own Noise Abatement Criteria (NAC). The NAC categories are listed in **Table 1**. If a project would result in higher Leq(h) values than the NAC values for a given location, then noise abatement or mitigation measures must be evaluated. For the noise-sensitive receptors where no frequent exterior human activity area is identifiable, then interior noise levels can be determined using adjustment factors and compared to the NAC in determining impacts in accordance with the ARDOT Noise Policy. An impact occurs when, at a given receiver, future noise levels approach by one dB(A), meet, or exceed the FHWA NAC for its activity category. An impact also occurs when the future noise levels exceed existing noise levels by 10 dB(A) at a given receiver. Once an impact is identified, then noise abatement is considered for the impacted area. Only those areas for which mitigation is determined to be feasible and reasonable as defined by ARDOT Noise Policy will be recommended.

Table 1 – Federal Highway Administration Noise Abatement Criteria (NAC) *Hourly A-Weighted Sound Level, decibels dB(A)*		
Activity Category	**Activity Criteria[1] Leq(h)[2]**	**Activity Description**
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[3]	67 (Exterior)	Residential
C[3]	67 (Exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreational areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 (Interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios
E[3]	72 (Exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	- -	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing
G	- -	Undeveloped lands that are not permitted

[1] The Leq(h) Activity Criteria values are for impact determination only and are not design standards for noise abatement measures.

[2] The equivalent steady-state sound level which in a stated period of time contains the same acoustic energy as the time-varying sound level during the same time period, with Leq(h) being the hourly value of Leq.

[3] Includes undeveloped lands permitted for this activity category.

4.0 Identification of Noise-Sensitive Land Uses and Noise Study Areas

Based on review of aerial photographs and field investigations, noise-sensitive land uses within the NAAs were identified as residential, associated with NAC Category B. The receptors evaluated for noise impacts during this noise study are shown in **Appendix A**.

Evaluation of NAC Categories A, C, D, E or G were not required, modeled, or applied.

5.0 Determination of Existing Sound Levels

For existing noise levels, traffic noise calculations based on 2018 year annual average daily traffic (AADT) volumes were performed using the FHWA TNM 2.5 model. This traffic data was developed by Garver and reviewed by ARDOT and shown in **Table 3**. The modeling assumed all vehicles were traveling at posted speed limits for the existing conditions and design speeds for future conditions.

Model Validation

ARDOT's noise policy requires validation of the FHWA TNM 2.5 program that is used to calculate worst-hour noise levels. Field measurements were performed using a Larson-Davis Model LxT1 precision sound level meter. There are no existing through roadways in close proximity to the proposed Highway 51 alignment; therefore, an ambient noise measurement (A-4) was collected at the end of S. 13th Street and use for validation purposes.

Three back-to-back sound level meter readings were conducted March 4, 2021 and collected for 15 minutes at one location (MV-1) along the proposed Highway 67 alignment. Additionally, two ambient noise measurements were collected within NAA 2 (A-1 and A-3). **Table 2** documents validation and ambient measurement results. Model validation and ambient measurements sites are shown in **Appendix A**.

A traffic count by vehicle type was collected simultaneously with the sound level readings associated with the validation measurements. The TNM model was calibrated using the existing roadway/traffic, and receiver locations. Traffic volumes counted during the short-term measurement periods were scaled up to one hour and entered into the TNM model. Noise measurement data sheets and photographs of the model validation and ambient measurement sites are provided in **Appendix C** and **D**, respectively. Measured versus predicted levels within ±3 dB(A) range are considered to have a reasonable agreement for validation purposes and indicates that the TNM 2.5 model developed for the study area would provide an acceptably accurate estimate of noise levels under varying future traffic conditions according to ARDOT's Noise Policy. The field data, sound meter calibration certificate, and the modeling results can be provided upon request.

Table 2 – Model Validation Measurements Highway 67, Arkadelphia Bypass, Clark County			
Receiver	**Field Record Noise Level dB(A) Leq(h)**	**TNM Predicted Noise Level dB(A) Leq(h)**	**Difference (field-model)**
MV-1A (3:40-3:55pm)	58.8	58.6	-0.2
MV-1B (4:00-4:15pm)	57.7	60.1	+2.4
MV-1C (4:18-4:33pm)	54.4	57.0	+2.6
Ambient Measurements			
A-1	63.4	--	--
A-3	45.0	--	--
A-4	50.0	--	--

Ten (10) receivers representing twelve (12) receptors were selected for modeling purposes to identify noise levels for the existing and future conditions. **Appendix A** depicts the location of the modeled receivers. NAC Activity Category B were utilized during this modeling effort to identify potential impacts to these receivers. Using the 2018 design traffic data and the existing roadway, the 2018 existing noise levels were modeled and the sound levels summarized in **Section 6.4**. The TNM data and results of the existing condition are available upon request.

6.0 Future Sound Levels and Impact Determinations

6.1 Traffic Data

All traffic data and roadway design were provided by Garver and included traffic projections that were developed for the existing 2018 and future 2040 years. Posted speeds on the local streets and existing Highway 67 ranged from 25 mph to 35 mph. Design speeds for the Preferred Alternative studied in this report are proposed to be 45 mph and 60 mph. Existing and future traffic data and roadways modeled in the TNM model runs are identified in **Table 3**.

Table 3 – Noise Model Traffic Volumes					
YEAR	**AADT**	**DHV**	**Cars**	**Medium Trucks**	**Heavy Trucks**
Proposed Highway 51 - NAA 1					
Proposed Highway 51 (West of Existing Highway 67)					
Existing (2018)	--	--	--	--	--
Future (2040)	1,600	181	175	2	4
Proposed Highway 67 - NAA 2					
Caddo St. – West of 10th Street					
Existing (2018)	3,400	340	330	3	7
Future (2040)	4,500	450	437	4	9
Caddo St. – East of 10th Street					
Existing (2018)	7,200	720	698	6	15
Future (2040)	10,000	1,000	970	9	21
S. 10th Street – South of Caddo Street					
Existing (2018)	1,200	120	116	1	3
Future (2040)	3,500	350	340	3	7
N. 10th Street – North of Caddo Street					
Existing (2018)	7,700	770	747	7	16
Future (2040)	11,500	1,150	1,116	10	24
Walnut Street – East of 10th Street					
Existing (2018)	3,200	320	307	4	9
Future (2040)	3,200	320	307	4	9
Main Street – Between S. 10th Street and 1st Street					
Existing (2018)	1,000	100	96	1	3
Future (2040)	1,000	100	96	1	3
Existing Highway 67					
Existing (2018)	2,800	280	272	3	6
Future (2040)	4,000	400	388	2	5

6.2 NAA 1

Using 2040 future design roadway and traffic data, no future noise impacts were determined to occur as a result of substantial increase (10 dB(A) or greater) or that will approach, meet, or exceed the 67 dB(A) Leq(h) for NAC Category B for NAA 1. No other traffic noise impacts are anticipated. Refer to **Section 6.4** for detailed results of the noise study.

6.3 NAA 2

Using 2040 future design roadway and traffic data, no future noise impacts were determined. No receivers will be impacted as a result of substantial increase (10 dB(A) or greater) or that will approach, meet, or exceed the 67 dB(A) Leq(h) for NAC Category B. No other traffic noise impacts are anticipated for NAA 2. Refer to **Sections 6.4** and **7.** for detailed results associated with NAA 2.

6.4 Impact Determinations

As shown in **Table 4**, based on the proposed project and future traffic volumes for Highways 51 and 67, no receivers, will approach or exceed the 67 dB(A) Leq(h) threshold for NAC Category B. Additionally, no receivers will experience a 10-decibel increase over the current conditions, which is considered to be a substantial increase for noise impact determination. The future noise levels for close receivers are expected to increase up to 9.8 decibels above existing levels. Detailed exhibits for each of the proposed alternatives are provided in **Appendix A**. Supporting data such as roadway typical section data, noise measurement data sheets, photographs and TNM data are located in **Appendices B** through **E**.

Table 4 – Results Summary

Receiver	Proposed Highway 51 – NAA 1					
	Category	No. of Dwelling Units	Existing dB(A)	Future dB(A)	Increase	Impact?
R-1	B	1	50.0*	58.5	8.5	N
R-2	B	1	50.0*	59.3	9.3	N
	Proposed Highway 67 – NAA 2					
R-8	B	1	47.7†	57.5	9.8	N
R-9	B	1	48.0†	57.7	9.7	N
R-10	B	1	48.3	56.9	8.6	N
R-11	B	3	49.7	56.8	7.1	N
R-12	B	1	50.2	57.5	7.3	N
R-13	B	1	51.0	57.5	6.5	N
R-14	B	1	53.9	57.8	3.9	N
R-15	B	1	57.6	61.3	3.7	N

*Existing conditions determined by ambient measurements. † Represents receiver existing conditions where decibel addition was applied.

7.0 Noise Abatement Evaluation

The consideration to construct a noise barrier in the form of a free-standing sound wall is regarded as the most appropriate form of noise abatement measure for proposed highway improvements due to available right-of-way and other constraining factors. As no receivers were determined to experience traffic noise impacts based on approaching, meeting or exceeding the NAC and substantial increase thresholds identified in Section 6.4, noise abatement was not evaluated in detail.

8.0 Construction Noise

In general, potential construction noise impacts for passing traffic and sensitive noise receptors near the project can be expected as a result of land clearing, grading and paving operations. Sources of construction noise include heavy machinery like backhoes and scrapers, cranes, pile drivers, and trucks transporting materials. Typically, construction noise can be minimized by implementing time of day restrictions for construction operations adjacent to noise sensitive areas and ensuring equipment has appropriate mufflers. ARDOT is concerned about any special noise-sensitive land uses or activities that may be affected by construction noise from the proposed project, and any special measures which are feasible and reasonable will be added to the project plans and specifications. Construction noise along the project may fluctuate, depending on construction phases, but will be temporary in nature.

9.0 Information for Local Officials

Traffic noises that approach, meet, or exceed the sound levels specified in the ARDOT Noise Policy resulting from the proposed Highway 67 project have been identified. To aid in noise compatible land use planning, using TNM 2.5, the approximate distances from the center of the proposed two and three-lane roadways was used to determine the noise impact contours of 66 dB(A). Although, the distances associated with noise impact contour zones vary due primarily to variation in the topography relative to the roadway, different traffic volumes and vehicle speeds associated with the new highway facility, noise impact contour zones of 66dB(A) for both Alternatives B and D fall within the proposed ROW. This technical report identifies where the 66 dB(A) contours are located in relation to the proposed right-of-way on both sides of the proposed Highway 67. Development within the 71dB(A) contour zones on either side of the proposed highway facility should be compatible with elevated traffic noise levels. Residential and other related land use is discouraged within the designated impact zone(s) due to anticipated future noise levels.

Table 5 – Noise Contour Impact Zones Proposed Highway 67		
Roadway Section	**66 dB(A)**	**71 dB(A)**
Alternative B Two-Lane Facility, 60 mph along Highway 51	Within Proposed ROW	Within Proposed ROW
Alternative D Three-Lane Facility, 45 mph along Highway 67	Within Proposed ROW	Within Proposed ROW

Distances vary along highway by location. Above distances occur at approximate average distances from the contour to the proposed highway centerline.

10.0 References

Arkansas Department of Transportation. September 13, 2018. *Policy on Highway Traffic Noise Abatement*.

Federal Highway Administration. November, 1974. The Audible Landscape: A Manual for Highway Noise and Land Use. https://www.fhwa.dot.gov/environment/noise/noise_compatible_planning/federal_approach/audible_landscape/index.cfm

Federal Highway Administration. May, 2002. Entering the Quiet Zone: Noise Compatible Land Use Planning. FHWA-EP-02-005. https://www.fhwa.dot.gov/environment/noise/noise_compatible_planning/federal_approach/land_use/index.cfm

Federal Highway Administration. 2018. Environmental Review Toolkit Webpage. https://www.environment.fhwa.dot.gov/index.asp

Electronic Code of Federal Regulations (e-CFR). 2018. Webpage. 23 CFR Part 772. https://www.ecfr.gov/cgi-bin/text-idx?SID=811ba0fef3d35407d30526d9cdbcadbd&mc=true&node=pt23.1.772&rgn=div5

APPENDICES

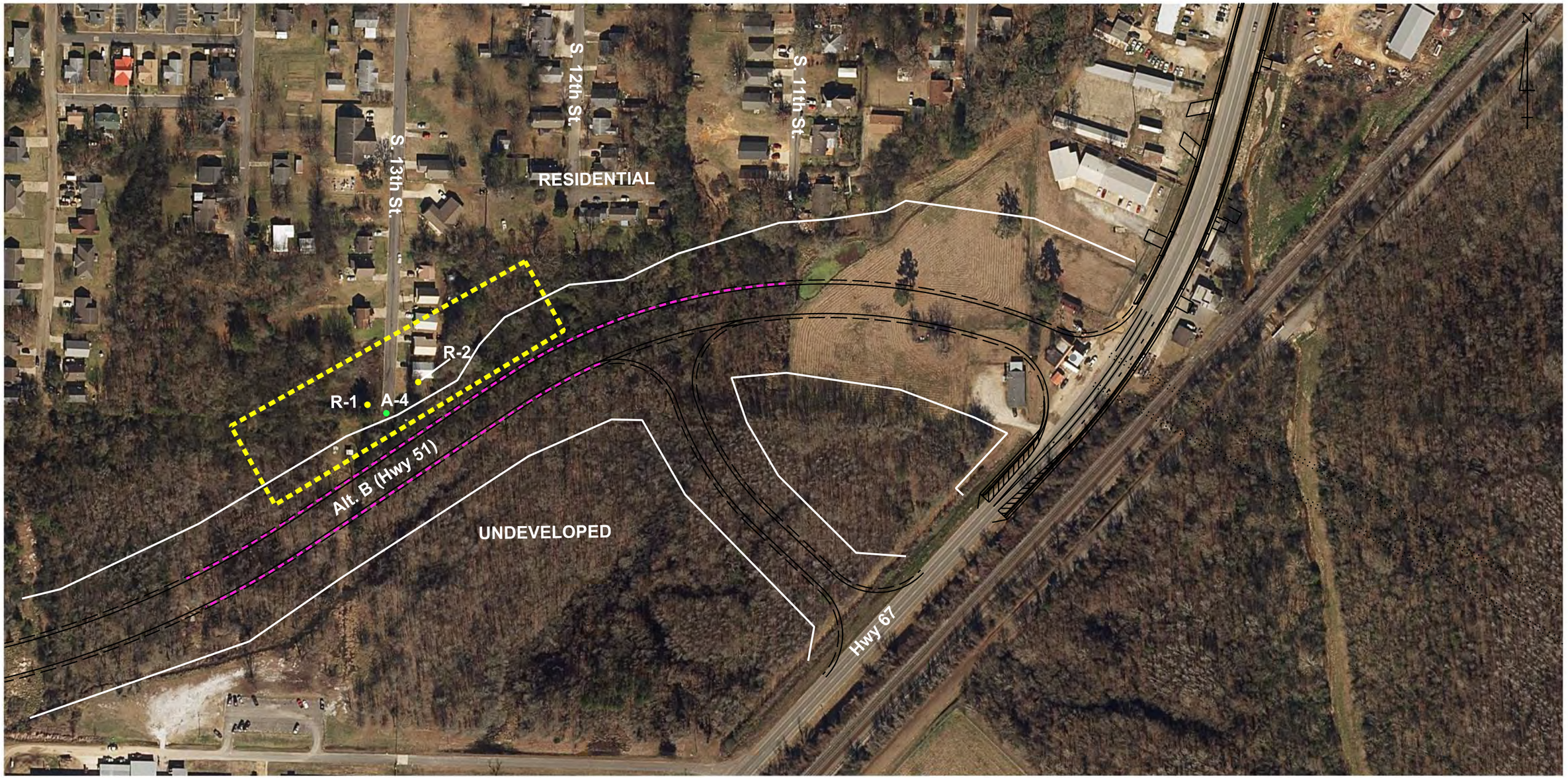
APPENDIX A

Noise Study Overview And Land Use Exhibits

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED
070442			

FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		070442		

(2) FIGURE 1 SCALE: 1"=200'

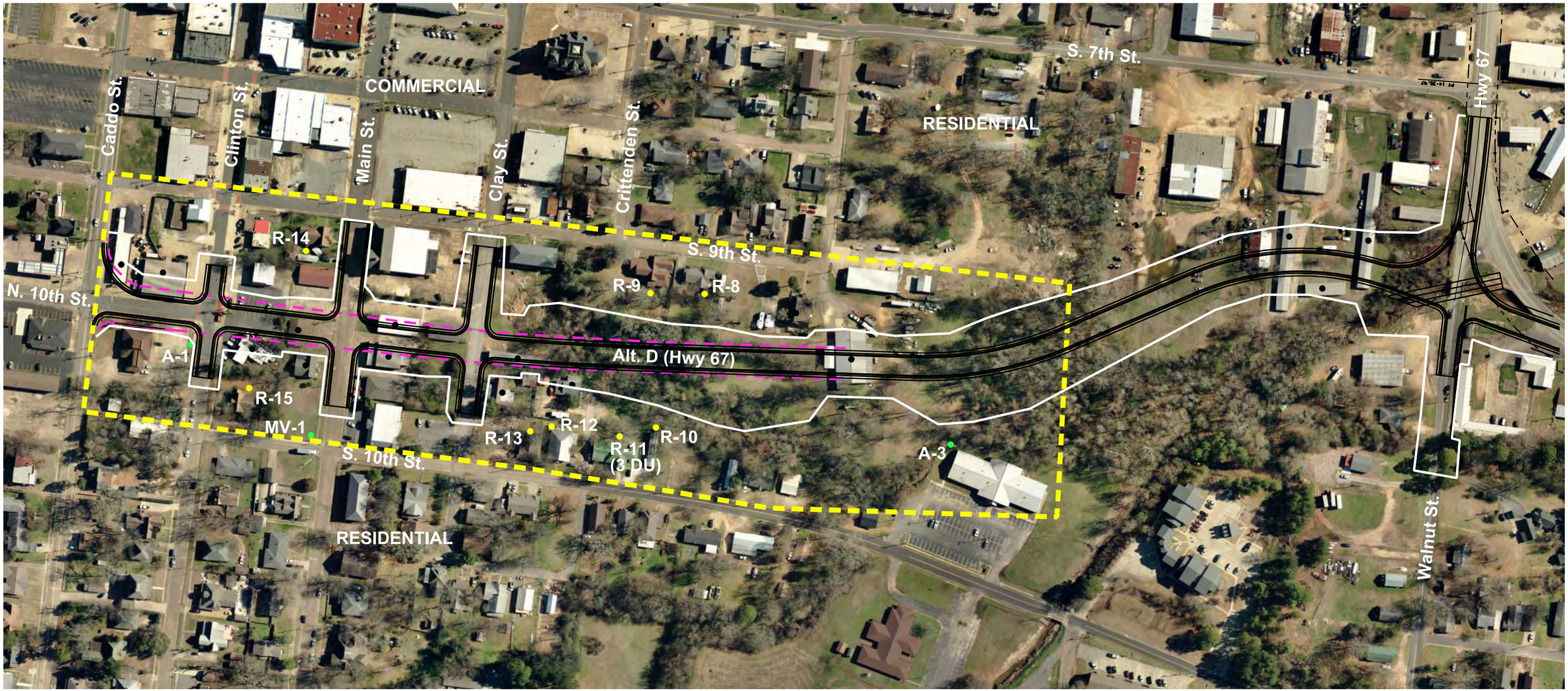


- PROPOSED ROADWAY (HIGHWAY 51)
- PROPOSED RIGHT OF WAY
- NOISE ASSESSMENT AREA
- 66DB(A) CONTOUR
- EVALUATED RECEIVER (DU - DWELLING UNITS)
- AMBIENT MEASUREMENT LOCATION
- PROPOSED RELOCATION

RCMountain 4/9/2021 2:01:33 PM
WORKSPACE: Garver_2012
L:\2017\17017515 - AHTD Arkadelphia Bypass\Drawings\DESIGN\RCM\Exhibits for Noise Rpt\Alt B Overview.dgn
REVISED DATE:

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070442		
				(2) FIGURE 2		SCALE: 1"=200'		

N



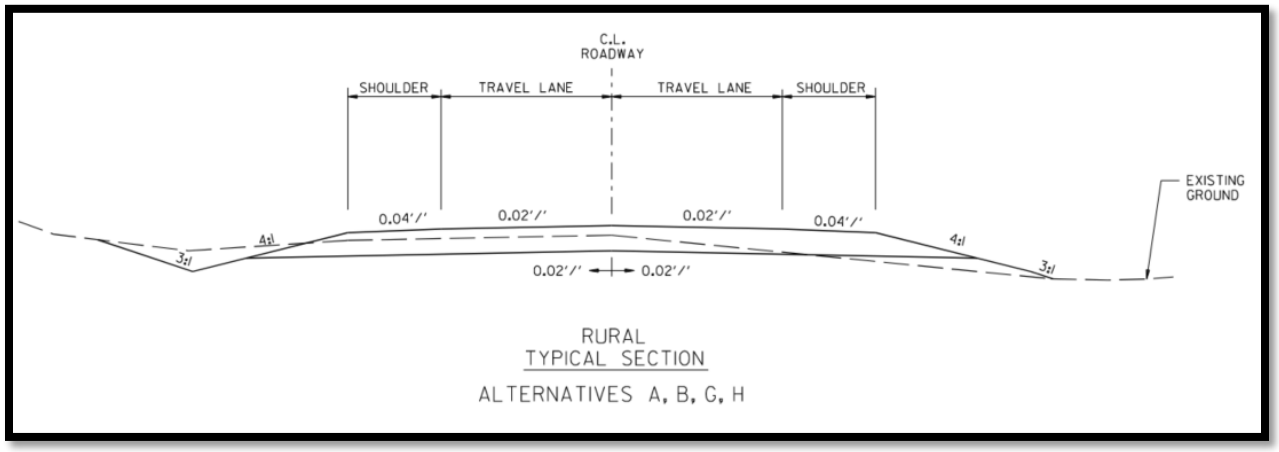
- PROPOSED ROADWAY (HIGHWAY 67)
- PROPOSED RIGHT OF WAY
- NOISE ASSESSMENT AREA
- 66DB(A) CONTOUR
- EVALUATED RECEIVER (DU - DWELLING UNITS)
- AMBIENT AND VALIDATION MEASUREMENT LOCATIONS
- PROPOSED RELOCATION

RCMOUNTAIN 4/6/2021 11:07:31 PM
WORKSPACE:GARVER_2012
L:\2017\17017515 - AHTD ARKADELPHIA BYPASS\DRAWINGS\DESIGN\RCM\EXHIBITS FOR NOISE RPT\R070442_PP_01_NOISE.DGN
REVISED DATE:

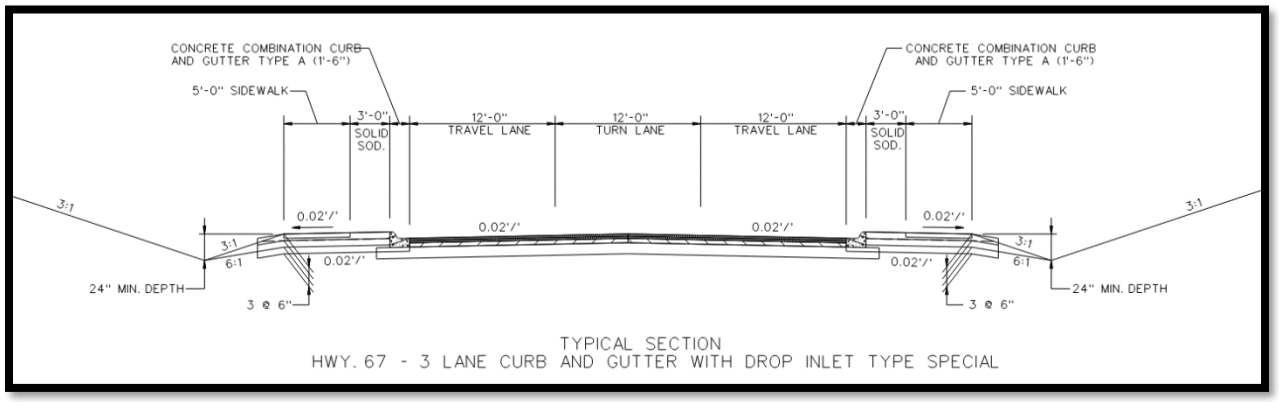
APPENDIX B

Roadway Typical Section Data

Alternative B Typical Section – Two 12’ Lanes with 8’ Shoulders



Alternative D Typical Section – Three 12’ Lanes with Curb and Gutter



APPENDIX C

Noise Measurement Data Sheets

Date 3-4-2021 Page 1 of 2

Site A-1

Validation of Modeled Sound Levels—Measurement Summary Sheet

Project Name	**Arkadelphia Bypass, ARDOT No. 07442**
Site/Address	**NE Corner of 10th St. and Clinton St.**
Observer Name	**Bill McAbee**

General Meteorological Conditions

Temperature(s)	**70 degrees F**
Wind Speed(s)	**5-10 mph**
Wind Direction(s)	**S**

SLM/Analyzer Information

SLM Model/Ser #	**LxT 1**
File numbers	
Microphone Ht.	**5'**

Calibration Information

	Pre-Measurement	Post-Measurement
Calibration Time	--	--
Calibration Level		

Site Sketch

(plan/profile view, distances, roadways, buildings, reflecting surfaces, ground type as appropriate) (Indicate North)

Site A-1

Validation of Modeled Sound Levels—Field Log

Period #	Start Time	Event Description(s) (include event start and stop)
1	**3:00 PM**	
2	**3:15 PM**	
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		

Notes:

4 diesel school buses
2 motorcycles
Several cars with windows down and loud music

Date 3-4-2018 Page 1 of 2

Site MV1A

Validation of Modeled Sound Levels—Measurement Summary Sheet

Project Name	**Arkadelphia Bypass, ARDOT No. 07442**
Site/Address	**NW Corner 10th St. & Main St.**
Observer Name	**Bill McAbee**

General Meteorological Conditions

Temperature(s)	**70 degrees F**
Wind Speed(s)	**10-15 mph**
Wind Direction(s)	**S**

SLM/Analyzer Information

SLM Model/Ser #	**LxT 1**
File numbers	
Microphone Ht.	**5'**

Calibration Information

	Pre-Measurement	Post-Measurement
Calibration Time	--	--
Calibration Level		

Site Sketch

(plan/profile view, distances, roadways, buildings, reflecting surfaces, ground type as appropriate) (Indicate North)

Site MV1A

Validation of Modeled Sound Levels—Field Log

Period #	Start Time	Event Description(s) (include event start and stop)
1	3:40 PM	
2	3:55 PM	
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		

TRAFFIC DATA SUMMARY				
Road Id/Direction:	10th North – stop	10th South - stop	Main East	Main West
Autos:	16 x 4 = 64	6 x 4 = 24	20 x 4 = 80	12 x 4 = 48
Medium Trucks:				1 x 4 = 4
Heavy Trucks:				
Posted Speed:	25	25	25	25

Notes:

Constant dog barking 1 block away

Validation of Modeled Sound Levels—Measurement Summary Sheet

Project Name	**Arkadelphia Bypass, ARDOT No. 07442**
Site/Address	**NW Corner 10th St. & Main St.**
Observer Name	**Bill McAbee**

General Meteorological Conditions

Temperature(s)	**70 degrees F**
Wind Speed(s)	**10-15 mph**
Wind Direction(s)	**S**

SLM/Analyzer Information

SLM Model/Ser #	**LxT 1**
File numbers	
Microphone Ht.	**5'**

Calibration Information

	Pre-Measurement	Post-Measurement
Calibration Time	--	--
Calibration Level		

Site Sketch

(plan/profile view, distances, roadways, buildings, reflecting surfaces, ground type as appropriate) (Indicate North)

Site MV1B

Validation of Modeled Sound Levels—Field Log

Period #	Start Time	Event Description(s) (include event start and stop)
1	4:00 PM	
2	4:15 PM	
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		

TRAFFIC DATA SUMMARY				
Road Id/Direction:	10th North – stop	10th South - stop	Main East	Main West
Autos:	17 x 4 = 68	5 x 4 = 20	8 x 4 = 32	4 x 4 = 16
Medium Trucks:	1 x 4 = 4			
Heavy Trucks:				
Posted Speed:	25	25	25	25

Notes:

Constant dog barking 1 block away

Site MV1C

Validation of Modeled Sound Levels—Measurement Summary Sheet

Project Name	**Arkadelphia Bypass, ARDOT No. 07442**
Site/Address	**NW Corner 10th St. & Main St.**
Observer Name	**Bill McAbee**

General Meteorological Conditions

Temperature(s)	**70 degrees F**
Wind Speed(s)	**10-15 mph**
Wind Direction(s)	**S**

SLM/Analyzer Information

SLM Model/Ser #	**LxT 1**
File numbers	
Microphone Ht.	**5'**

Calibration Information

	Pre-Measurement	Post-Measurement
Calibration Time	--	--
Calibration Level		

Site Sketch

(plan/profile view, distances, roadways, buildings, reflecting surfaces, ground type as appropriate) (Indicate North)

Date 5-27-2020 Page 1 of 2

Site A-3

Validation of Modeled Sound Levels—Measurement Summary Sheet

Project Name	**Arkadelphia Bypass, ARDOT No. 07442**
Site/Address	**10th behind Dept. of Human Services**
Observer Name	**Matt Strawn**

General Meteorological Conditions

Temperature(s)	**76 degrees F 68% Humidity**
Wind Speed(s)	**8 mph**
Wind Direction(s)	**--**

SLM/Analyzer Information

SLM Model/Ser #	**LxT 1**
File numbers	
Microphone Ht.	**5'**

Calibration Information

	Pre-Measurement	Post-Measurement
Calibration Time	--	--
Calibration Level		

Site Sketch

(plan/profile view, distances, roadways, buildings, reflecting surfaces, ground type as appropriate) (Indicate North)

Site A-3

Validation of Modeled Sound Levels—Field Log

Job 070442								
Noise Measurement Data				**Tempurature**	76F			
Date	5/27/2020			**Humidity**	68%			
Site	Ambient 3			**Wind**	Calm 8mph			
Desc.	10th behind Dept. of Human Services			**Sky**	Cloudy			
Period #	**Time Start**	**Leq**	**Lmax**	**Note**	**Keep?**	**Energy**		**Count**
1	11:50:05	41.8	45.9		Y	14999		1
2	11:51:05	43.7	45.6		Y	23200		1
3	11:52:05	44.3	46.0		Y	27003		1
4	11:53:05	45.9	48.5		Y	39029		1
5	11:54:05	46.5	52.3		Y	44351		1
6	11:55:05	45.9	55.4		Y	39164		1
7	11:56:05	45.3	49.1		Y	33500		1
8	11:57:05	45.9	51.8		Y	39220		1
9	11:58:05	45.7	51.8		Y	37141		1
10	11:59:05	43.7	47.2		Y	23303		1
11	12:00:05	46.4	53.1		Y	43811		1
12	12:01:05	47.1	53.0	*Tornado Siren Test*	N	0		0
13	12:02:05	46.4	52.4	*Tornado Siren Test*	N	0		0
14	12:03:05	42.1	44.2	*Tornado Siren Test*	N	0		0
15	12:04:05	43.3	51.0		**Y**	21568		1
16	12:05:05	46.3	52.6		Y	42243		1
17	12:06:05	45.2	52.1		Y	33335		1
18	12:07:05	42.2	44.8		Y	16739		1
19	12:08:05	44.3	50.8		Y	26988		1
20	12:09:05	44.6	49.4		Y	28733		1
				Energy Sum		534326		17
				Leq of good periods		45.0		

Date 5-27-2020 Page 1 of 2

Site A-4

Validation of Modeled Sound Levels—Measurement Summary Sheet

Project Name	**Arkadelphia Bypass, ARDOT No. 07442**
Site/Address	**End of 13th Street**
Observer Name	**Matt Strawn**

General Meteorological Conditions

Temperature(s)	**76 degrees F 68% Humidity**
Wind Speed(s)	**8 mph**
Wind Direction(s)	**--**

SLM/Analyzer Information

SLM Model/Ser #	**LxT 1**
File numbers	
Microphone Ht.	**5'**

Calibration Information

	Pre-Measurement	Post-Measurement
Calibration Time	--	--
Calibration Level		

Site Sketch

(plan/profile view, distances, roadways, buildings, reflecting surfaces, ground type as appropriate) (Indicate North)

Site A-4

Validation of Modeled Sound Levels—Field Log

Job 070442

Noise Measurement Data

Date	5/27/2020	**Tempurature**	76F
Site	Ambient 4	**Humidity**	68%
Desc.	End of 13th St.	**Wind**	Calm 8mph
		Sky	Partly Cloudy

Period #	Time Start	Leq	Lmax	Note	Keep?	Energy	Count
1	12:20:18	50.5	54.2		Y	113268	1
2	12:21:18	50.7	54.9		Y	117743	1
3	12:22:18	49.9	51.9		Y	98138	1
4	12:23:18	49.0	49.6		Y	78607	1
5	12:24:18	57.5	63.7	*Loud truck started near mic*	N	0	0
6	12:25:18	49.6	56.4		Y	90170	1
7	12:26:18	48.8	50.0		Y	75501	1
8	12:27:18	49.9	51.4		Y	98231	1
9	12:28:18	49.4	53.3		Y	87372	1
10	12:29:18	49.5	50.8		Y	89794	1
11	12:30:18	49.5	50.5		Y	89652	1
12	12:31:18	50.6	52.5		Y	113661	1
13	12:32:18	50.4	51.7		Y	109837	1
14	12:33:18	50.8	52.0		Y	120722	1
15	12:34:18	50.7	52.4		Y	117232	1
				Energy Sum		1399926	14
				Leq of good periods		50.0	

Notes: Can hear Siplast plant from this location

APPENDIX D

Photographs

▲View of A-1 location near the NE corner of S. 10th Street and Clinton Street.

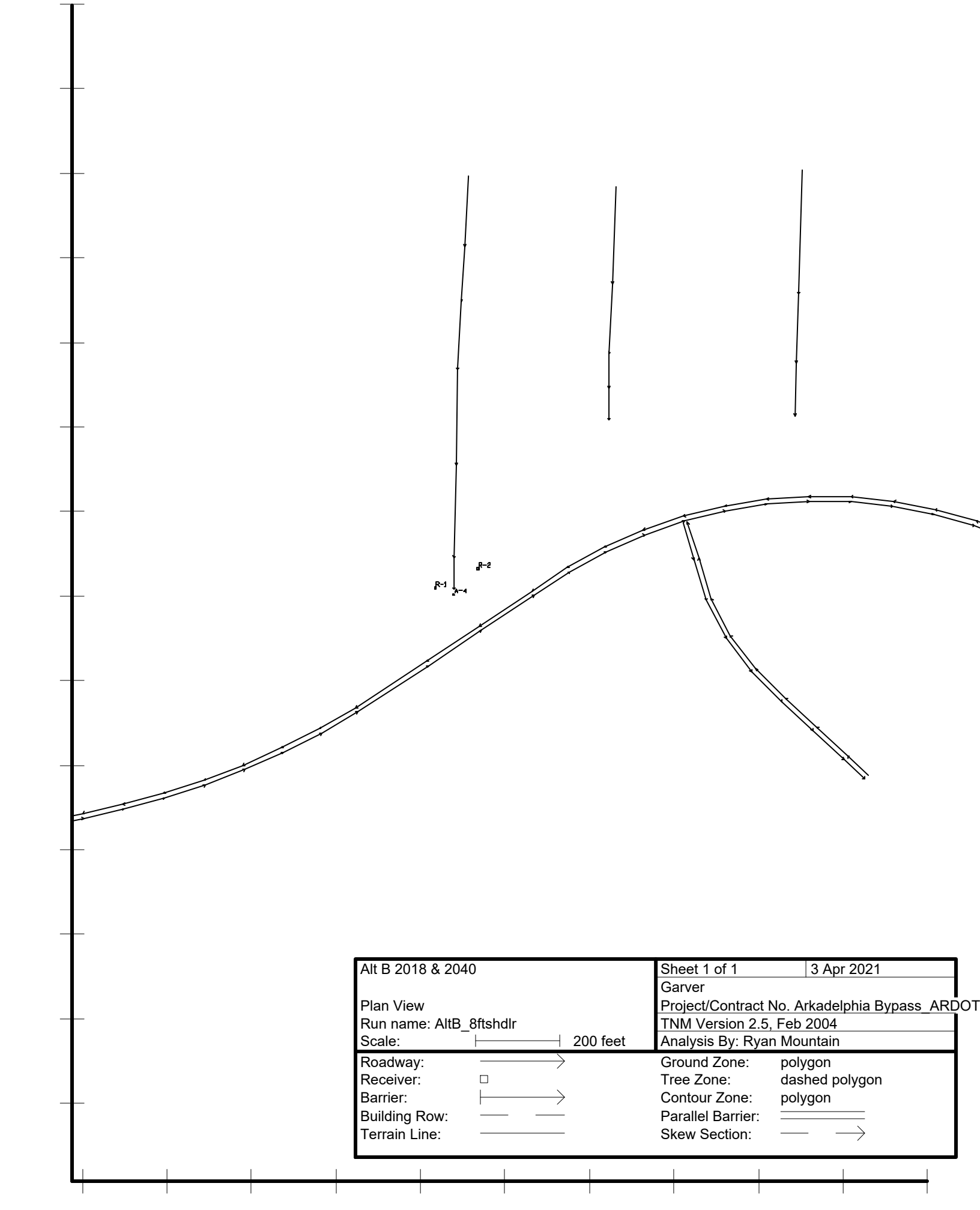
▲MV1 A-C location near the NW corner of S. 10th Street and Main Street.

▲A-3 location looking west.

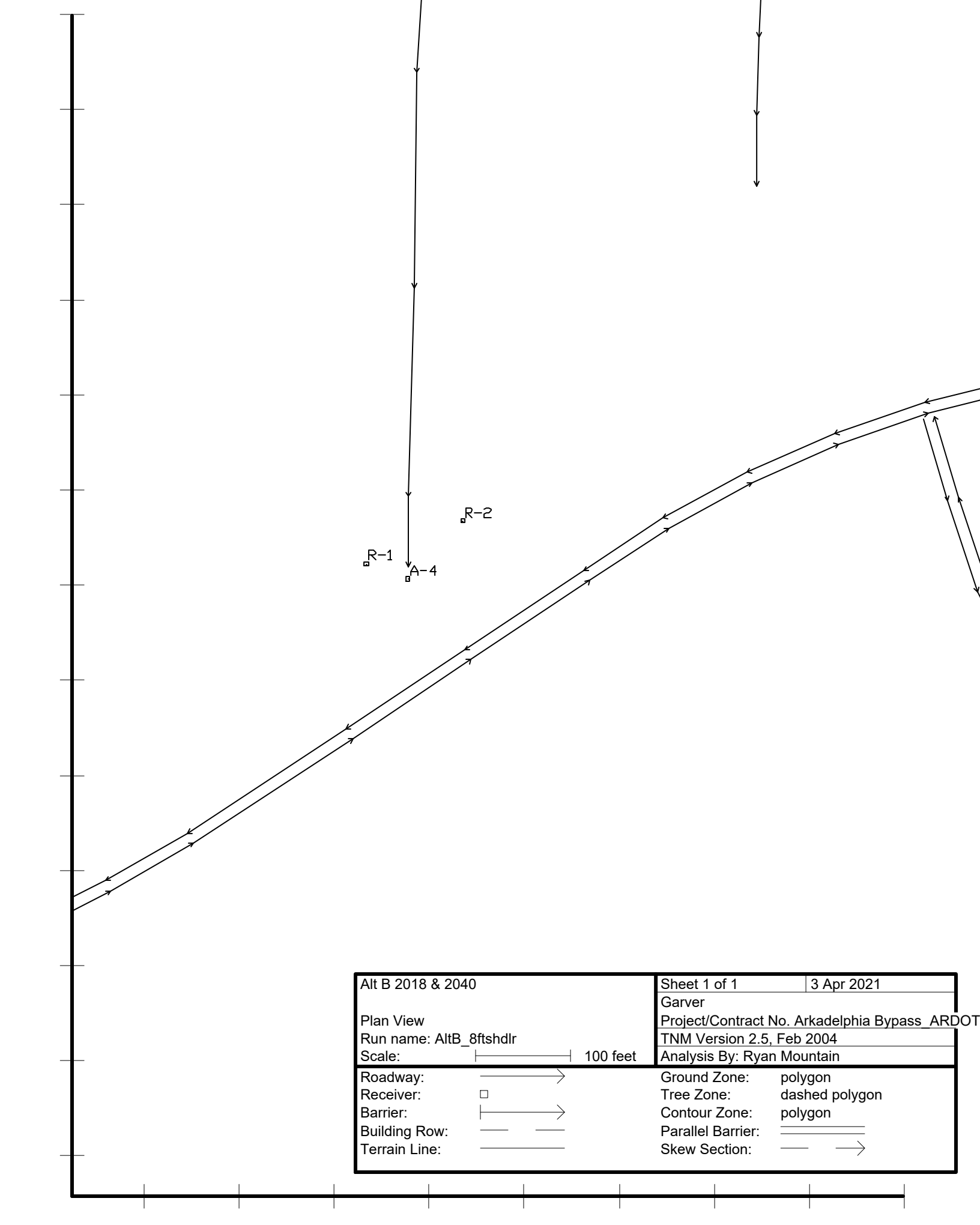
▲A-4 location looking west with R-1 in the background.

APPENDIX E

TNM Data



Alt B 2018 & 2040		Sheet 1 of 1	3 Apr 2021
		Garver	
Plan View		Project/Contract No. Arkadelphia Bypass_ARDOT	
Run name: AltB_8ftshdlr		TNM Version 2.5, Feb 2004	
Scale:	200 feet	Analysis By: Ryan Mountain	
Roadway:		Ground Zone:	polygon
Receiver:		Tree Zone:	dashed polygon
Barrier:		Contour Zone:	polygon
Building Row:		Parallel Barrier:	
Terrain Line:		Skew Section:	



Alt B 2018 & 2040		Sheet 1 of 1	3 Apr 2021
		Garver	
Plan View		Project/Contract No. Arkadelphia Bypass_ARDOT	
Run name: AltB_8ftshdlr		TNM Version 2.5, Feb 2004	
Scale:	100 feet	Analysis By: Ryan Mountain	
Roadway:		Ground Zone:	polygon
Receiver:		Tree Zone:	dashed polygon
Barrier:		Contour Zone:	polygon
Building Row:		Parallel Barrier:	
Terrain Line:		Skew Section:	

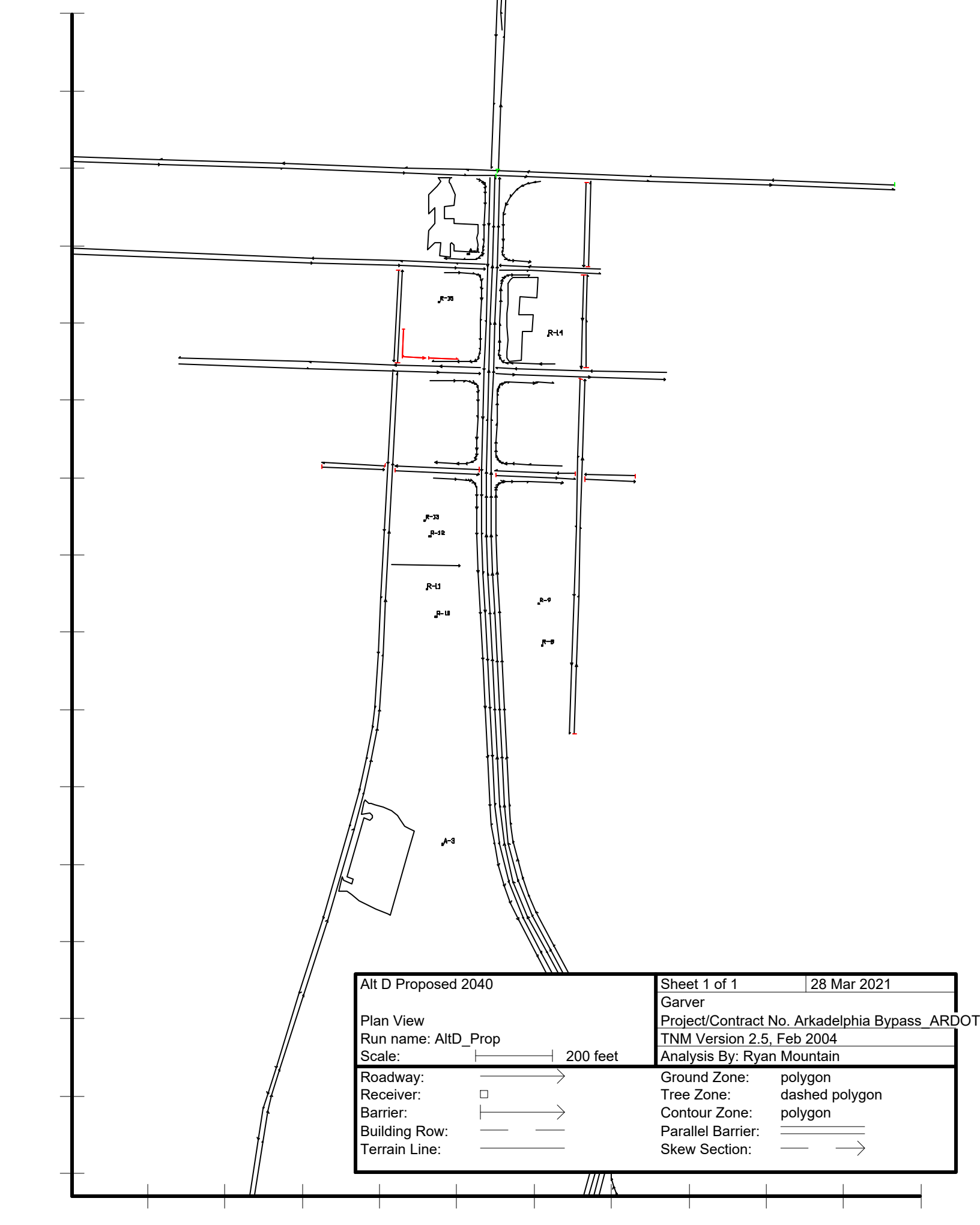
Garver
Ryan Mountain
3 April 2021
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: Arkadelphia Bypass_ARDOT No. 07442
RUN: Alt B 2018 & 2040
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

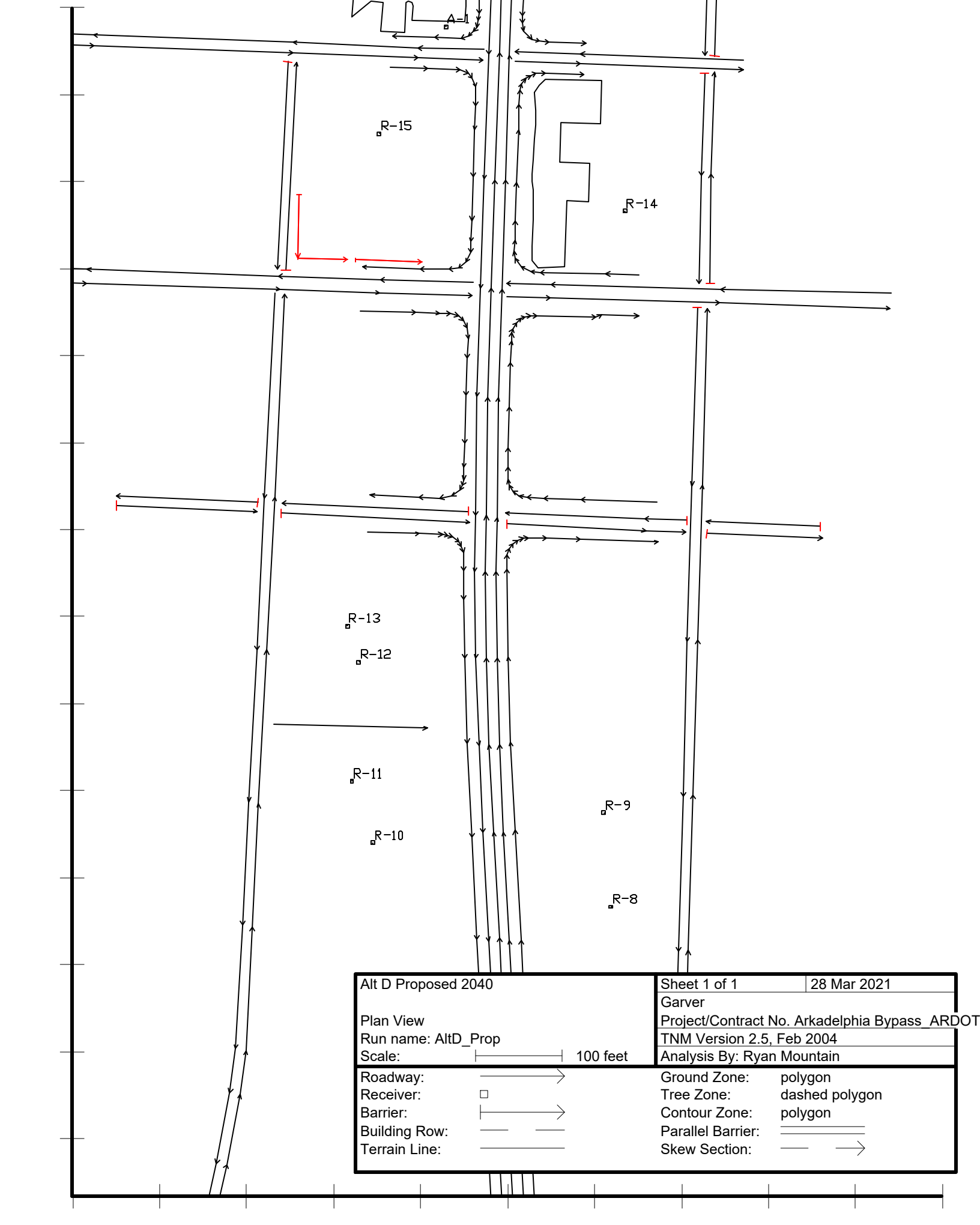
Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R-1	23	1	50.0	58.5	66	8.5	10	----	58.5	0.0	8	-8.0
R-2	24	1	50.0	59.3	66	9.3	10	----	59.3	0.0	8	-8.0
A-4	26	1	50.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	3	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0



Alt D Proposed 2040		Sheet 1 of 1	28 Mar 2021
		Garver	
Plan View		Project/Contract No. Arkadelphia Bypass_ARDOT	
Run name: AltD_Prop		TNM Version 2.5, Feb 2004	
Scale:	200 feet	Analysis By: Ryan Mountain	
Roadway:		Ground Zone:	polygon
Receiver:		Tree Zone:	dashed polygon
Barrier:		Contour Zone:	polygon
Building Row:		Parallel Barrier:	
Terrain Line:		Skew Section:	



Alt D Proposed 2040	Sheet 1 of 1 | 28 Mar 2021
	Garver
Plan View	Project/Contract No. Arkadelphia Bypass_ARDOT
Run name: AltD_Prop	TNM Version 2.5, Feb 2004
Scale: 100 feet	Analysis By: Ryan Mountain

Roadway:		Ground Zone:	polygon
Receiver:		Tree Zone:	dashed polygon
Barrier:		Contour Zone:	polygon
Building Row:		Parallel Barrier:	
Terrain Line:		Skew Section:	

Garver
Ryan Mountain

28 March 2021
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: Arkadelphia Bypass_ARDOT No. 07442
RUN: Alt D Proposed 2040
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R-8	8	1	47.7	57.5	66	9.8	10	----	57.5	0.0	8	-8.0
R-9	9	1	48.0	57.7	66	9.7	10	----	57.7	0.0	8	-8.0
R-10	10	1	48.3	56.9	66	8.6	10	----	56.9	0.0	8	-8.0
R-11	11	3	49.7	56.8	66	7.1	10	----	56.8	0.0	8	-8.0
R-12	12	1	50.2	57.5	66	7.3	10	----	57.5	0.0	8	-8.0
R-13	13	1	51.0	57.5	66	6.5	10	----	57.5	0.0	8	-8.0
R-14	14	1	53.9	57.8	66	3.9	10	----	57.8	0.0	8	-8.0
R-15	15	1	57.6	61.3	66	3.7	10	----	61.3	0.0	8	-8.0
A-1	18	1	61.4	63.9	66	2.5	10	----	63.9	0.0	8	-8.0
A-3	19	1	44.0	52.4	66	8.4	10	----	52.4	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	12	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

GARVER

Appendix C – AGENCY COORDINATION

U.S. Department of Transportation
Federal Highway Administration

Arkansas Division

700 West Capitol Ave
Suite 3130
Little Rock AR 72201
(501) 324-6430

April 12, 2021

In Reply Refer To:
ARDOT Job No. 070442
Hwy. 67 – Hwy. 51
(Arkadelphia Bypass) P.E.
Clark County
HDA-AR

Dr. Andrea Hunter
Tribal Historic Preservation Officer
The Osage Nation
627 Grandview Avenue
Pawhuska, OK 74056

Dear Dr. Hunter:

As part of continuing consultation, we have enclosed for your review the Cultural Resources Survey Report for the above noted job. A copy was submitted to the SHPO for review and concurrence provided. If you have any questions, comments, or need additional information, please contact me at (501) 324-6430 or at randal.looney@dot.gov.

Sincerely,

Randal Looney

Randal Looney
Environmental Coordinator

Enclosure

U.S. Department of Transportation
Federal Highway Administration

Arkansas Division

700 West Capitol Ave
Suite 3130
Little Rock AR 72201
(501) 324-6430

April 12, 2021

ARDOT Job No. 070442
Hwy. 67 – Hwy. 51
(Arkadelphia Bypass) P.E.
Clark County
HDA-AR

Ms. Tamara Francis
Tribal Historic Preservation Officer
Caddo Nation
P.O. Box 487
Binger, OK 73009

Dear Ms. Francis:

As part of continuing consultation, we have enclosed for your review the Cultural Resources Survey Report for the above noted job. A copy was submitted to the SHPO for review and concurrence provided. If you have any questions, comments, or need additional information, please contact me at (501) 324-6430 or at randal.looney@dot.gov.

Sincerely,

Randal Looney
Environmental Coordinator

Enclosure

Asa Hutchinson
Governor
Stacy Hurst
Secretary

April 1, 2021

Mr. John Fleming
Division Head
Environmental Division
Arkansas Department of Transportation
P.O. Box 2261
Little Rock, AR 72203-2261

Re: Clark County – Arkadelphia
Section 106 Review – FHWA
Hwy. 67 – Hwy. 51
(Arkadelphia Bypass) (S)
Cultural Resources Survey Report – *Phase I Cultural Resources Survey of the Arkadelphia Bypass (Hwy 67 to Hwy 51), Clark County, Arkansas* (Panamerican Report No. 38044)
ARDOT Job Number 070442
AHPP Tracking Number 101106.03

Dear Mr. Fleming:

The staff of the Arkansas Historic Preservation Program (AHPP) reviewed the cultural resources survey report for the above-referenced undertaking in Sections 24 and 25 of Township 7 South, Range 20 West and Sections 19, 20, and 30 of Township 7 South, Range 19 West in Arkadelphia, Clark County.

Based on the provided information, including the negative results of the field investigation, the AHPP concurs with a finding of **no historic properties affected pursuant to 36 CFR § 800.4(d)(1)** and the recommendation for no further archeological work in advance of the undertaking.

Tribes that have expressed an interest in the area include the Caddo Nation, the Chickasaw Nation, the Choctaw Nation of Oklahoma, the Osage Nation, the Quapaw Nation, and the Shawnee Tribe. We recommend consultation in accordance with 36 CFR § 800.2(c)(2).

Thank you for the opportunity to review this undertaking and thorough reporting. If you have any questions, please contact Eric Mills of my staff at (501) 324-9784 or eric.mills@arkansas.gov.

Sincerely,

for
Scott Kaufman
Director, AHPP

cc: Mr. Randal Looney, Federal Highway Administration
Dr. Melissa Zabecki, Arkansas Archeological Survey

Schmidt, Cassie P.

From: Lewis, Lindsey <lindsey_lewis@fws.gov>
Sent: Wednesday, July 21, 2021 3:59 PM
To: Schmidt, Cassie P.
Subject: Re: [EXTERNAL] Arkadelphia Bypass (ARDOT Job 070442) - Consultation code: 04ER1000-2021-TA-1308

Cassie,

As stated in the Consistency Letter, "The Service concurs with these “NLAA” determination(s) for the listed species identified. No further consultation for this project is required for these species. The verification letter confirms you may rely on effect determinations provided in the Arkansas Determination Key for project review and guidance for federally listed species to satisfy agency consultation requirements under Section 7(a)(2) of the Endangered Species Act of 1973 (87 Stat. 884, as amended 16 U.S.C. 1531 et seq.; ESA)."

Based upon your IPaC submission, the Action is consistent with activities analyzed in the Northern Long-eared Bat (NLEB) PBO. The Action may affect the NLEB; however, any take that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o). Unless the Service advises you within 30 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that the PBO satisfies and concludes your responsibilities for this Action under ESA Section 7(a)(2) with respect to the NLEB.

The Service recommends that your agency contact the Arkansas Ecological Services Field Office or re-evaluate this key in IPaC if: 1) the scope, timing, duration, or location of the proposed project changes, 2) new information reveals the action may affect listed species or designated critical habitat; 4) a new species is listed or critical habitat designated. If any of the above conditions occurs, additional consultation with the Arkansas Ecological Services Field Office should take place before project changes are final or resources committed.

The Service has no additional comments or concerns and concurs with the determinations made through the Arkansas Dkey and NLEB Dkey.

Thanks,

Lindsey Lewis
Biologist

US Fish & Wildlife Service
Arkansas Field Office
110 South Amity Rd., Suite 300
Conway, Arkansas 72032

(501) 513-4489 - voice
(501) 513-4480 - fax
Lindsey_Lewis@fws.gov
http://www.fws.gov/arkansas-es/

NOTE: This email correspondence and any attachments to and from this sender is subject to the Freedom of Information Act (FOIA) and may be disclosed to third parties.

From: Schmidt, Cassie P. <CPSchmidt@GarverUSA.com>
Sent: Wednesday, July 21, 2021 9:20 AM
To: Lewis, Lindsey <lindsey_lewis@fws.gov>
Cc: Ewing, Anne (Kayti) <Kayti.Ewing@ardot.gov>; McAbee, William C. <WCMcAbee@GarverUSA.com>; Pearson, Mary <Mary.Pearson@ardot.gov>
Subject: [EXTERNAL] Arkadelphia Bypass (ARDOT Job 070442) - Consultation code: 04ER1000-2021-TA-1308

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

Good Morning Lindsey,

In September 2020 we prepared the attached Protected Species Memo for the proposed Arkadelphia Bypass project (ARDOT Job 070442) in Clark County. This document was included with the FHWA-approve EA. At that time, multiple alternatives were under consideration, including an alternative that crossed the Ouachita River. Thus the original species list had 11 species.

A Preferred Alternative has now been identified and we are in the process of preparing a FONSI document. If you are interested, details on the Preferred Alternative are available on the project website: https://arkadelphiabypass.transportationplanroom.com/

Using a more refined area based on the Preferred Alternative, I evaluated the Preferred Alternative through the Arkansas DKey and the Northern Long-eared Bat Key within the IPaC system. The refined area resulted in only 6 of the original 11 species. Attached are the verification letters received.

We respectfully request your concurrence with the NLAA determinations generated using the Arkansas DKey, concurrence that the Action is consistent with the PBO on the Final 4(d) Rule for the Northern Long-eared Bat, and acknowledgment that this finalizes Section 7 consultation for the proposed project.

Most Sincerely,

Cassie Schmidt
Environmental Scientist/Environmental Specialist
Transportation Team

479-287-4673

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Arkansas Ecological Services Field Office
110 South Amity Suite 300
Conway, AR 72032-8975
Phone: (501) 513-4470 Fax: (501) 513-4480
http://www.fws.gov/arkansas-es

In Reply Refer To: July 20, 2021
Consultation code: 04ER1000-2021-TA-1308
Event Code: 04ER1000-2021-E-03840
Project Name: Arkadelphia Bypass (ARDOT Job 070442)

Subject: Verification letter for 'Arkadelphia Bypass (ARDOT Job 070442)' for specified federally threatened and endangered species and designated critical habitat that may occur in your proposed project area consistent with the Arkansas Determination Key for project review and guidance for federally listed species (Arkansas Dkey).

Dear Garver LLC:

The U.S. Fish and Wildlife Service (Service) received on **July 20, 2021** your effect determination(s) for the 'Arkadelphia Bypass (ARDOT Job 070442)' (the Action) using the Arkansas DKey within the Information for Planning and Consultation (IPaC) system. The Service developed this system in accordance with the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.).

Based on your answers and the assistance in the Service's Arkansas DKey, you made the following effect determination(s) for the proposed action.

Species	**Listing Status**	**Determination**
Eastern Black Rail (*Laterallus jamaicensis ssp. jamaicensis*)	Threatened	NLAA
Northern Long-eared Bat (*Myotis septentrionalis*)	Threatened	May affect
Piping Plover (*Charadrius melodus*)	Threatened	NLAA
Red Knot (*Calidris canutus rufa*)	Threatened	NLAA
Red-cockaded Woodpecker (*Picoides borealis*)	Endangered	NLAA
Winged Mapleleaf (*Quadrula fragosa*)	Endangered	NLAA

Status

The Service concurs with the NLAA determination(s) for the species listed above. Your agency has met consultation requirements by informing the Service of the "No Effect" determinations.

No further consultation for this project is required for these species. This letter confirms you may rely on effect determinations provided in the Arkansas Determination Key for project review and guidance for federally listed species to satisfy agency consultation requirements under Section 7(a)(2) of the Endangered Species Act of 1973 (87 Stat. 884, as amended 16 U.S.C. 1531 et seq.; ESA).

FHWA projects should not use the Arkansas Dkey for the Northern Long-eared Bat (NLEB) or Indiana Bat. Please complete the FHWA, FRA, FTA Programmatic Consultation for Transportation Projects affecting NLEB or Indiana Bat determination key. This key is intended for projects funded or authorized by FHWA, FRA, or FTA, that may affect the endangered Indiana bat and/or the threatened NLEB, which requires consultation with the Service under Section 7 of the ESA.

The Service recommends that your agency contact the Arkansas Ecological Services Field Office or re-evaluate this key in IPaC if: 1) the scope, timing, duration, or location of the proposed project changes, 2) new information reveals the action may affect listed species or designated critical habitat; 4) a new species is listed or critical habitat designated. If any of the above conditions occurs, additional consultation with the Arkansas Ecological Services Field Office should take place before project changes are final or resources committed.

Bald and Golden Eagle Protection Act: The following resources are provided to project proponents and consulting agencies as additional information. Bald and golden eagles are not included in this section 7(a)(2) consultation and this information does not constitute a determination of effects by the Service.

The Service developed the National Bald Eagle Management Guidelines to advise landowners, land managers, and others who share public and private lands with Bald Eagles when and under what circumstances the protective provisions of the BGEPA may apply to their activities. The guidelines should be consulted prior to conducting new or intermittent activity near an eagle nest. This document may be downloaded from the following site: https://www.fws.gov/southeast/our-services/permits/eagles/

To determine if your proposed activity is likely to take or disturb Bald Eagles, complete our step-by-step online self-certification process, which is located at https://www.fws.gov/southeast/our-services/eagle-technical-assistance/.

If the recommendations detailed in the National Bald Eagle Management Guidelines cannot be followed, you may apply for a permit to authorize removal or relocation of an eagle nest in certain instances. The application form is located at http://www.fws.gov/forms/3-200-72.pdf.

Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

Arkadelphia Bypass (ARDOT Job 070442)

2. Description

The following description was provided for the project 'Arkadelphia Bypass (ARDOT Job 070442)':

> The Arkansas Department of Transportation (ARDOT) is proposing to construct a bypass and modify the Interstate 30 (I-30) and Highway (Hwy.) 51 interchange (I-30/Hwy. 51 interchange) in the City of Arkadelphia to improve safety, mobility, and connectivity.
>
> Several ARDOT planning studies have identified the Central Business District (CBD) and the east side of the I-30/Hwy. 51 interchange as areas in Arkadelphia where safety and mobility are inadequate. These studies include the 2006 Arkadelphia Truck Route Study, 2013 Arkadelphia Bypass Study, and the 2020 Arkadelphia Bypass Traffic Study.
>
> The purpose of the project is to improve safety, mobility, and connectivity in Arkadelphia by providing:
> • An alternate route to reduce the number of logging and other heavy-duty trucks traveling through the CBD;
> • A more direct east-west travel route for both local and through traffic; and
> • I-30/Hwy. 51 interchange modifications to reduce traffic congestion and increase emergency vehicle access to and from the Baptist Hospital.
>
> The typical section for Hwy. 67 between Pine Street and the interchange with the bypass south of Walnut Street isthe initial buildout. This section would consist of two travel lanes and a middle turn lane with curb and gutter, sidewalk and open ditches behind the sidewalk. The ultimate future buildout for this section when traffic warrants would consist of four travel lanes and a continuous left-turn lane with curb and gutter. The initial and ultimate future typical section from the north end of Redhill Road to Hwy 51 is the same as described above except there will not be open ditches behind the sidewalk.
> The typical section for the southern portion of the bypass between Highway 67 and the north end of Redhill Road would consist of two travel lanes and a middle turn lane with open shoulders for the initial buildout. The ultimate future buildout for this section when traffic warrants would consist of four travel lanes with a painted median.

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@34.112682649999996,-93.09513394138855,14z

51
Arkadelphia
26

Species Protection Measures
Streambank Stabilization
https://www.fws.gov/southeast/pdf/species-protective-measures/streambank-stabilization-projects.pdf

Bridges and Culverts
https://www.fws.gov/southeast/pdf/species-protective-measures/bridge-and-culvert-projects.pdf

Pipeline and Linear Projects
https://www.fws.gov/southeast/pdf/species-protective-measures/pipeline-and-linear-projects.pdf

Stream or Ditch Relocation
https://www.fws.gov/southeast/pdf/species-protective-measures/stream-or-ditch-relocation-projects.pdf

Qualification Interview

1. Have you made an effects determination of "no effect" for all species in the area of the project? A "no effect" determination means the project will have no beneficial effect, no short-term adverse effects, and no long-term adverse effects on any of the species on the IPaC-generated species list for the proposed project or those species habitat. A project with effects that cannot be meaningfully measured, detected or evaluated, effects that are extremely unlikely to occur, or entirely beneficial effects should not have a "no effect" determination. (If unsure, select "No").

   No

2. Is the action authorized, funded, or being carried out by a Federal agency?

   Yes

3. Are you the the action agency or the designated non-federal representative?

   No

4. Choose the agency you represent in this consultation with the U.S. Fish and Wildlife Service:

   d. Federal Highway Administration

5. Will project proponents follow Special Provisions for avoidance and minimization measures for listed species in Arkansas?

   Yes

6. [Semantic] Does the project intersect designated critical habitat for the Leopard Darter?

   Automatically answered
   No

7. [Semantic] Does the project intersect designated critical habitat for the Neosho Mucket?

   Automatically answered
   No

8. [Semantic] Does the project intersect designated critical habitat for Yellowcheek Darter?

   Automatically answered
   No

9. [Semantic] Does the project intersect designated critical habitat for Rabbitsfoot?

   Automatically answered
   No

10. [Semantic] Does the project intersect the American burying beetle consultation area?

    Automatically answered
    No

11. [Semantic] Does the project intersect the red-cockaded woodpecker AOI?

    Automatically answered
    Yes

12. [Semantic] Does the project intersect the Eastern black rail AOI?

    Automatically answered
    Yes

13. Will the project affect sand and gravel areas or shorelines along rivers, lakes, or reservoirs?

    No

14. Does the project take place in marshy or flooded open field habitat?

    Yes

15. Will any part of the project take place between March 15 and May 15 OR between July 15 and October 1?

    Yes

16. Has Eastern Black Rail been detected at the site?

    No

17. [Semantic] Does the project intersect the red knot AOI?

    Automatically answered
    Yes

18. [Semantic (same answer as "8.1.3"] Will the project affect sand and gravel areas or shorelines along rivers, lakes, or reservoirs?

    Automatically answered
    No

19. [Semantic (same answer as "8.2"] Does the project take place in marshy or flooded open field habitat?

    Automatically answered
    Yes

20. [Semantic (same answer as "8.3"] Will any part of the project take place between March 15 and May 15 OR between July 15 and October 1?

    Automatically answered
    Yes

21. Are red knots present on the site during the proposed action?

    No

22. [Semantic] Does the project intersect the Piping Plover AOI?

    Automatically answered
    Yes

23. [Semantic (same answer as "8.1.3 or 9.3"] Will the project affect sand and gravel areas or shorelines along rivers, lakes, or reservoirs?

    Automatically answered
    No

24. [Semantic (same answer as "8.3" or "9.9")] Will any part of the project take place between March 15 and May 15 OR between July 15 and October 1?

    Automatically answered
    Yes

25. [Semantic] Does the project intersect the Whooping Crane AOI?

    Automatically answered
    No
26. [Semantic] Does the project intersect the interior least tern AOI?

    Automatically answered
    No
27. [Semantic] Does the project intersect the Gray Bat AOI?

    Automatically answered
    No
28. [Semantic] Does the project intersect the Ozark Big-eared Bat AOI?

    Automatically answered
    No
29. [Semantic] Does the project intersect the Indiana bat AOI?

    Automatically answered
    No
30. [Semantic] Does the project intersect the Northern Long-eared bat AOI?

    Automatically answered
    Yes
31. [Semantic] Does the project intersect the Benton County Cave Crayfish AOI?

    Automatically answered
    No
32. [Semantic] Does the project intersect the Hell Creek Cave Crayfish AOI?

    Automatically answered
    No
33. [Semantic] Does the project intersect the Ozark cavefish AOI?

    Automatically answered
    No
34. [Semantic] Does the project intersect the Missouri bladderpod AOI?

    Automatically answered
    No
35. [Semantic] Does the project intersect the Geocarpon AOI?

    Automatically answered
    No
36. [Semantic] Does the project intersect the running buffalo clover AOI?

    Automatically answered
    No
37. [Semantic] Does the project intersect the Pondberry AOI?

    Automatically answered
    No

38. [Semantic] Does the project occur within the survey coordination area?

    Automatically answered

    No

39. Does the project contain any of the following activity types:
    Boat Ramps,
    Bridges,
    Culverts,
    Development,
    Dams or Impoundments (including berms and levees),
    Streambank Stabilization (or other streambank work),
    Pipeline and linear projects,
    Water intakes/withdrawls, or
    Stream or ditch relocation?

    Yes

40. Does the project include Streambank Stabilization (or other streambank work)?

    Yes

41. Does the project include the Streambank Stabilization species protective measures, as applicable to the project and site characteristics?

    Yes

42. Does the project include Boat Ramps?

    No

43. Does the project include Bridges and Culverts?

    Yes

44. Does the project include the Bridges and Culverts species protective measures, as applicable to the project and site characteristics?

    Yes

45. Does the project include Dams and Impoundments (including berms or levees)?

    No

46. Does the project include Development?

    No

47. Is the project a Pipeline or Linear Project?

    Yes

48. Does the project include the Pipeline and Linear Projects species species protective measures, as applicable to the project and site characteristics?

    Yes

49. Does the project include Water Intakes/Withdrawals?

    No

50. Does the project include Stream or Ditch Relocation?

    Yes

51. Does the project include the Stream or Ditch Relocation species protective measures, as applicable to the project and site characteristics?

    Yes

52. [Semantic] Does the project intersect the rabbitsfoot AOI?

    Automatically answered
    No

53. [Semantic] Does the project instersect the neosho mucket AOI?

    Automatically answered
    No

54. [Semantic] Does the project instersect the Spectaclecase AOI?

    Automatically answered
    No

55. [Semantic] Does the project instersect the snuffbox AOI?

    Automatically answered
    No

56. [Semantic] Does the project instersect the speckled pocketbook AOI?

    Automatically answered
    No

57. [Semantic] Does the project instersect the ouachita rock pocketbook AOI?

    Automatically answered
    No

58. [Semantic] Does the project instersect the fat pocketbook AOI?

    Automatically answered
    No

59. [Semantic] Does the project instersect the Curtis pearlymussel AOI?

    Automatically answered
    No

60. [Semantic] Does the project instersect the scaleshell AOI?

    Automatically answered
    No

61. [Semantic] Does the project instersect the pink mucket AOI?

    Automatically answered
    No

62. [Semantic] Does the project instersect the Arkansas fatmucket AOI?

    Automatically answered
    No

63. [Semantic] Does the project instersect the winged mapleleaf AOI?

    Automatically answered
    Yes

64. [Semantic] Does the project instersect the leopard darter AOI?

    Automatically answered

    No

65. [Semantic] Does the project instersect the Yellowcheek darter AOI?

    Automatically answered

    No

66. [Semantic] Does the project instersect the Ozark hellbender AOI?

    Automatically answered

    No

67. [Semantic] Does the project instersect the harperella AOI?

    Automatically answered

    No

68. [Semantic] Does the project instersect the pallid sturgeon AOI?

    Automatically answered

    No

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Arkansas Ecological Services Field Office
110 South Amity Suite 300
Conway, AR 72032-8975
Phone: (501) 513-4470 Fax: (501) 513-4480
http://www.fws.gov/arkansas-es

In Reply Refer To: July 20, 2021
Consultation code: 04ER1000-2021-TA-1308
Event Code: 04ER1000-2021-E-03836
Project Name: Arkadelphia Bypass (ARDOT Job 070442)

Subject: Verification letter for the 'Arkadelphia Bypass (ARDOT Job 070442)' project under the January 5, 2016, Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-eared Bat and Activities Excepted from Take Prohibitions.

Dear Garver LLC:

The U.S. Fish and Wildlife Service (Service) received on July 20, 2021 your effects determination for the 'Arkadelphia Bypass (ARDOT Job 070442)' (the Action) using the northern long-eared bat (*Myotis septentrionalis*) key within the Information for Planning and Consultation (IPaC) system. This IPaC key assists users in determining whether a Federal action is consistent with the activities analyzed in the Service's January 5, 2016, Programmatic Biological Opinion (PBO). The PBO addresses activities excepted from "take"[1] prohibitions applicable to the northern long-eared bat under the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.).

Based upon your IPaC submission, the Action is consistent with activities analyzed in the PBO. The Action may affect the northern long-eared bat; however, any take that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o). Unless the Service advises you within 30 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that the PBO satisfies and concludes your responsibilities for this Action under ESA Section 7(a)(2) with respect to the northern long-eared bat.

Please report to our office any changes to the information about the Action that you submitted in IPaC, the results of any bat surveys conducted in the Action area, and any dead, injured, or sick northern long-eared bats that are found during Action implementation. If the Action is not completed within one year of the date of this letter, you must update and resubmit the information required in the IPaC key.

This IPaC-assisted determination allows you to rely on the PBO for compliance with ESA Section 7(a)(2) only for the northern long-eared bat. It **does not** apply to the following ESA-protected species that also may occur in the Action area:

- Eastern Black Rail *Laterallus jamaicensis ssp. jamaicensis* Threatened
- Piping Plover *Charadrius melodus* Threatened
- Red Knot *Calidris canutus rufa* Threatened
- Red-cockaded Woodpecker *Picoides borealis* Endangered
- Winged Mapleleaf *Quadrula fragosa* Endangered

If the Action may affect other federally listed species besides the northern long-eared bat, a proposed species, and/or designated critical habitat, additional consultation between you and this Service office is required. If the Action may disturb bald or golden eagles, additional coordination with the Service under the Bald and Golden Eagle Protection Act is recommended.

---

[1]Take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct [ESA Section 3(19)].

Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

Arkadelphia Bypass (ARDOT Job 070442)

2. Description

The following description was provided for the project 'Arkadelphia Bypass (ARDOT Job 070442)':

> The Arkansas Department of Transportation (ARDOT) is proposing to construct a bypass and modify the Interstate 30 (I-30) and Highway (Hwy.) 51 interchange (I-30/Hwy. 51 interchange) in the City of Arkadelphia to improve safety, mobility, and connectivity.
>
> Several ARDOT planning studies have identified the Central Business District (CBD) and the east side of the I-30/Hwy. 51 interchange as areas in Arkadelphia where safety and mobility are inadequate. These studies include the 2006 Arkadelphia Truck Route Study, 2013 Arkadelphia Bypass Study, and the 2020 Arkadelphia Bypass Traffic Study.
>
> The purpose of the project is to improve safety, mobility, and connectivity in Arkadelphia by providing:
> • An alternate route to reduce the number of logging and other heavy-duty trucks traveling through the CBD;
> • A more direct east-west travel route for both local and through traffic; and
> • I-30/Hwy. 51 interchange modifications to reduce traffic congestion and increase emergency vehicle access to and from the Baptist Hospital.
>
> The typical section for Hwy. 67 between Pine Street and the interchange with the bypass south of Walnut Street isthe initial buildout. This section would consist of two travel lanes and a middle turn lane with curb and gutter, sidewalk and open ditches behind the sidewalk. The ultimate future buildout for this section when traffic warrants would consist of four travel lanes and a continuous left-turn lane with curb and gutter. The initial and ultimate future typical section from the north end of Redhill Road to Hwy 51 is the same as described above except there will not be open ditches behind the sidewalk.
> The typical section for the southern portion of the bypass between Highway 67 and the north end of Redhill Road would consist of two travel lanes and a middle turn lane with open shoulders for the initial buildout. The ultimate future buildout for this section when traffic warrants would consist of four travel lanes with a painted median.

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@34.112682649999996,-93.09513394138855,14z

Determination Key Result

This Federal Action may affect the northern long-eared bat in a manner consistent with the description of activities addressed by the Service's PBO dated January 5, 2016. Any taking that may occur incidental to this Action is not prohibited under the final 4(d) rule at 50 CFR §17.40(o). Therefore, the PBO satisfies your responsibilities for this Action under ESA Section 7(a)(2) relative to the northern long-eared bat.

Determination Key Description: Northern Long-eared Bat 4(d) Rule

This key was last updated in IPaC on May 15, 2017. Keys are subject to periodic revision.

This key is intended for actions that may affect the threatened northern long-eared bat.

The purpose of the key for Federal actions is to assist determinations as to whether proposed actions are consistent with those analyzed in the Service's PBO dated January 5, 2016.

Federal actions that may cause prohibited take of northern long-eared bats, affect ESA-listed species other than the northern long-eared bat, or affect any designated critical habitat, require ESA Section 7(a)(2) consultation in addition to the use of this key. Federal actions that may affect species proposed for listing or critical habitat proposed for designation may require a conference under ESA Section 7(a)(4).

Determination Key Result

This project may affect the threatened Northern long-eared bat; therefore, consultation with the Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.) is required. However, based on the information you provided, this project may rely on the Service's January 5, 2016, *Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-Eared Bat and Activities Excepted from Take Prohibitions* to fulfill its Section 7(a)(2) consultation obligation.

Qualification Interview

1. Is the action authorized, funded, or being carried out by a Federal agency?

   Yes

2. Have you determined that the proposed action will have "no effect" on the northern long-eared bat? (If you are unsure select "No")

   No

3. Will your activity purposefully **Take** northern long-eared bats?

   No

4. [Semantic] Is the project action area located wholly outside the White-nose Syndrome Zone?

   Automatically answered
   No

5. [Semantic] Is the project action area located within 0.25 miles of a known northern long-eared bat hibernaculum?

   Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency

   Automatically answered
   No

6. [Semantic] Is the project action area located within 150 feet of a known occupied northern long-eared bat maternity roost tree?

   Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency

   Automatically answered
   No

Project Questionnaire

If the project includes forest conversion, report the appropriate acreages below. Otherwise, type '0' in questions 1-3.

1. Estimated total acres of forest conversion:

42

2. If known, estimated acres of forest conversion from April 1 to October 31

42

3. If known, estimated acres of forest conversion from June 1 to July 31

42

If the project includes timber harvest, report the appropriate acreages below. Otherwise, type '0' in questions 4-6.

4. Estimated total acres of timber harvest

0

5. If known, estimated acres of timber harvest from April 1 to October 31

0

6. If known, estimated acres of timber harvest from June 1 to July 31

0

If the project includes prescribed fire, report the appropriate acreages below. Otherwise, type '0' in questions 7-9.

7. Estimated total acres of prescribed fire

0

8. If known, estimated acres of prescribed fire from April 1 to October 31

0

9. If known, estimated acres of prescribed fire from June 1 to July 31

0

If the project includes new wind turbines, report the megawatts of wind capacity below. Otherwise, type '0' in question 10.

10. What is the estimated wind capacity (in megawatts) of the new turbine(s)?

0