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

Job Number 070442

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.

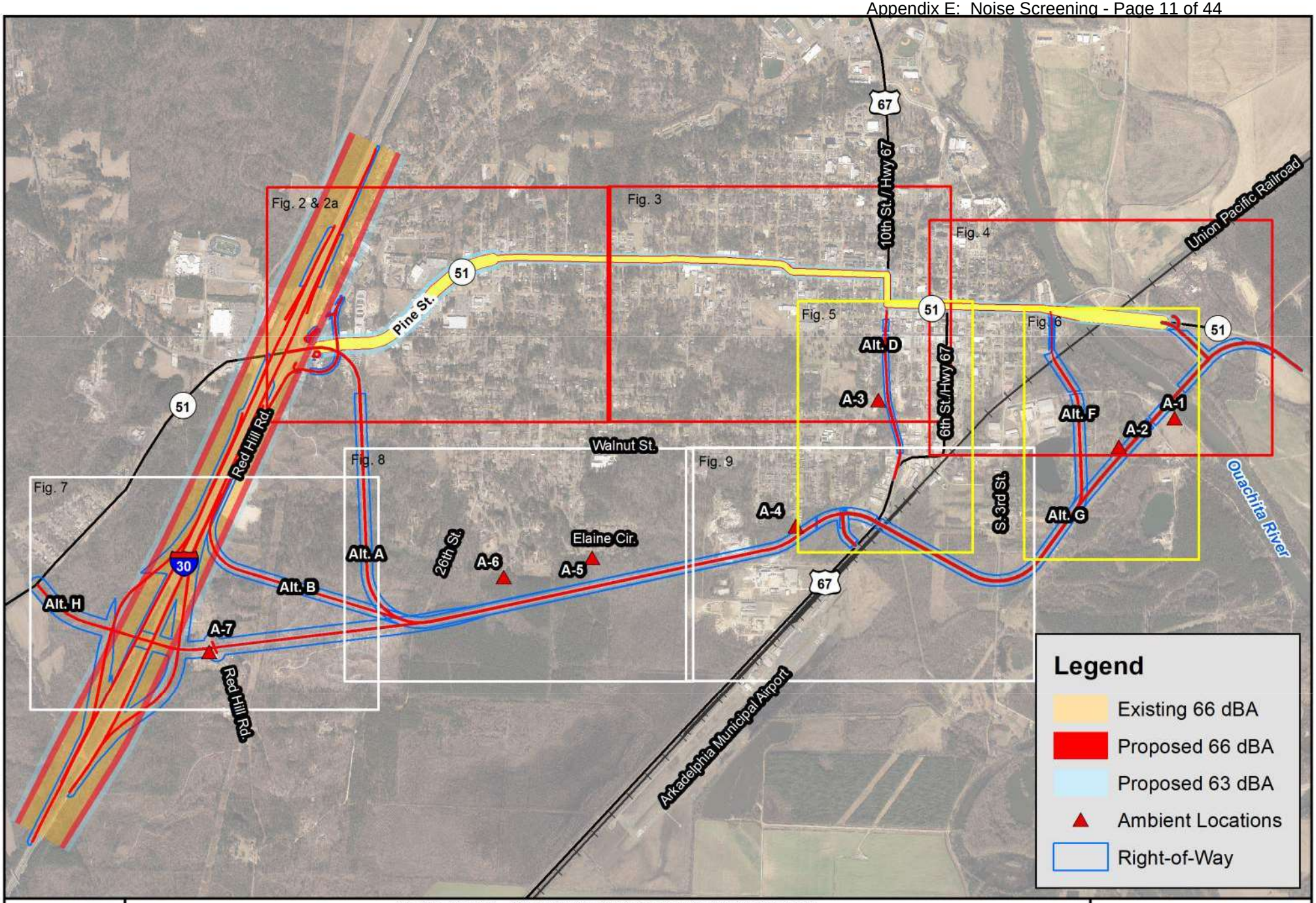
Job Number 070442

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



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

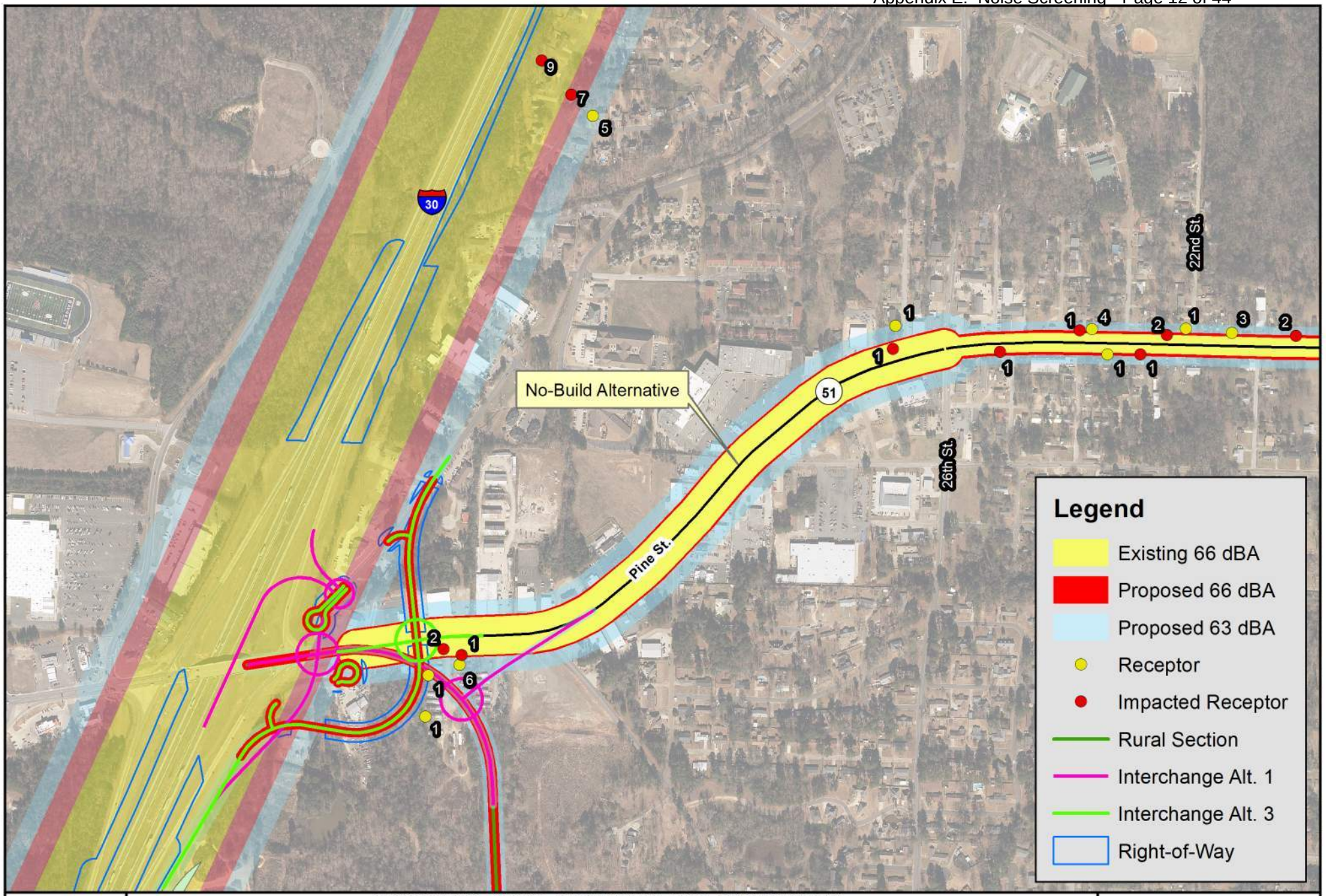
2017 Aerial Image; ARKANSAS GIS OFFICE

GARVER

N

0 0.1 0.2 0.3 0.4 0.5
Miles

Figure 1



GARVER

N

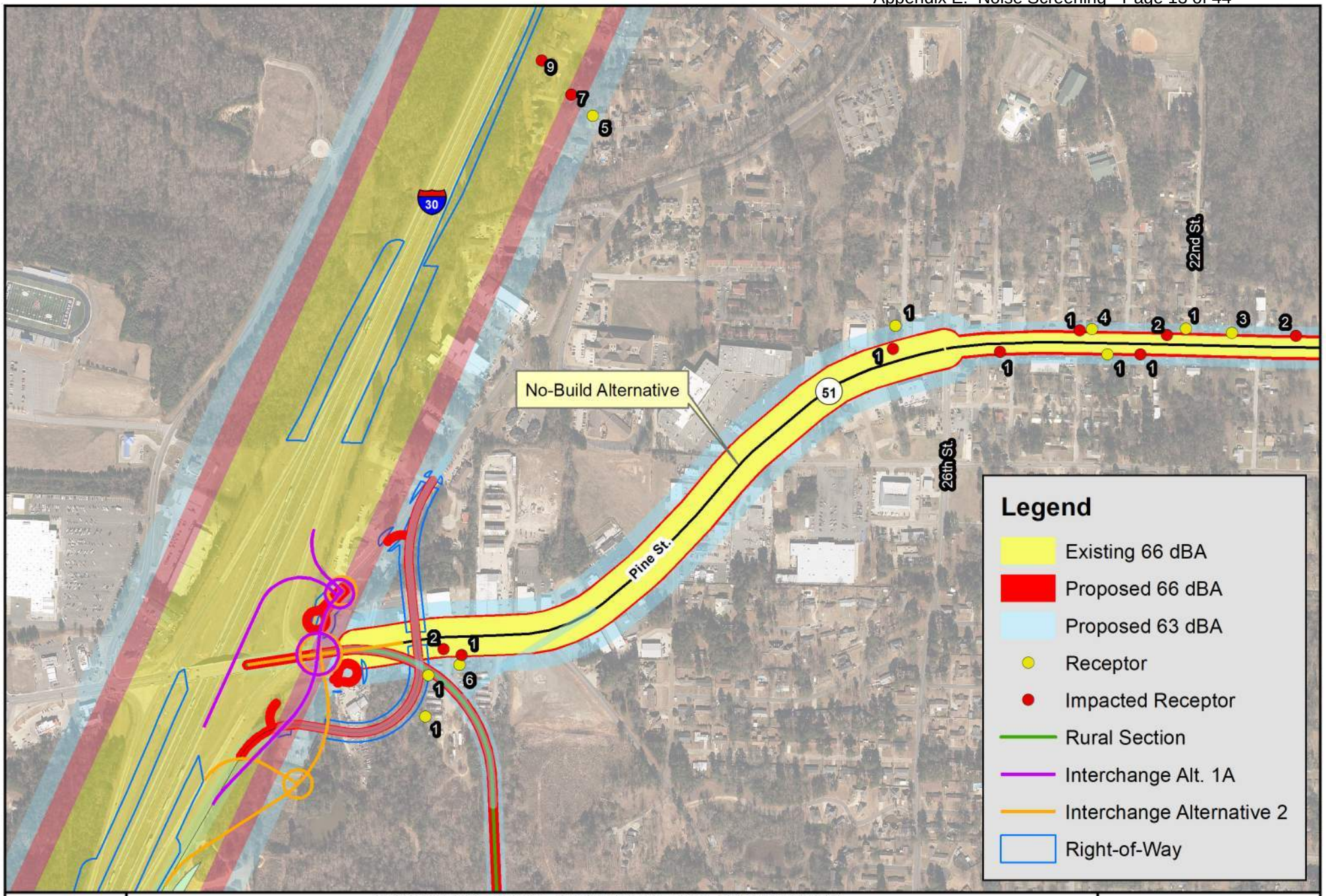
NOISE MEMO - 63 & 66 dB CONTOUR LINES - DETAILED VIEW

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 2



GARVER

N

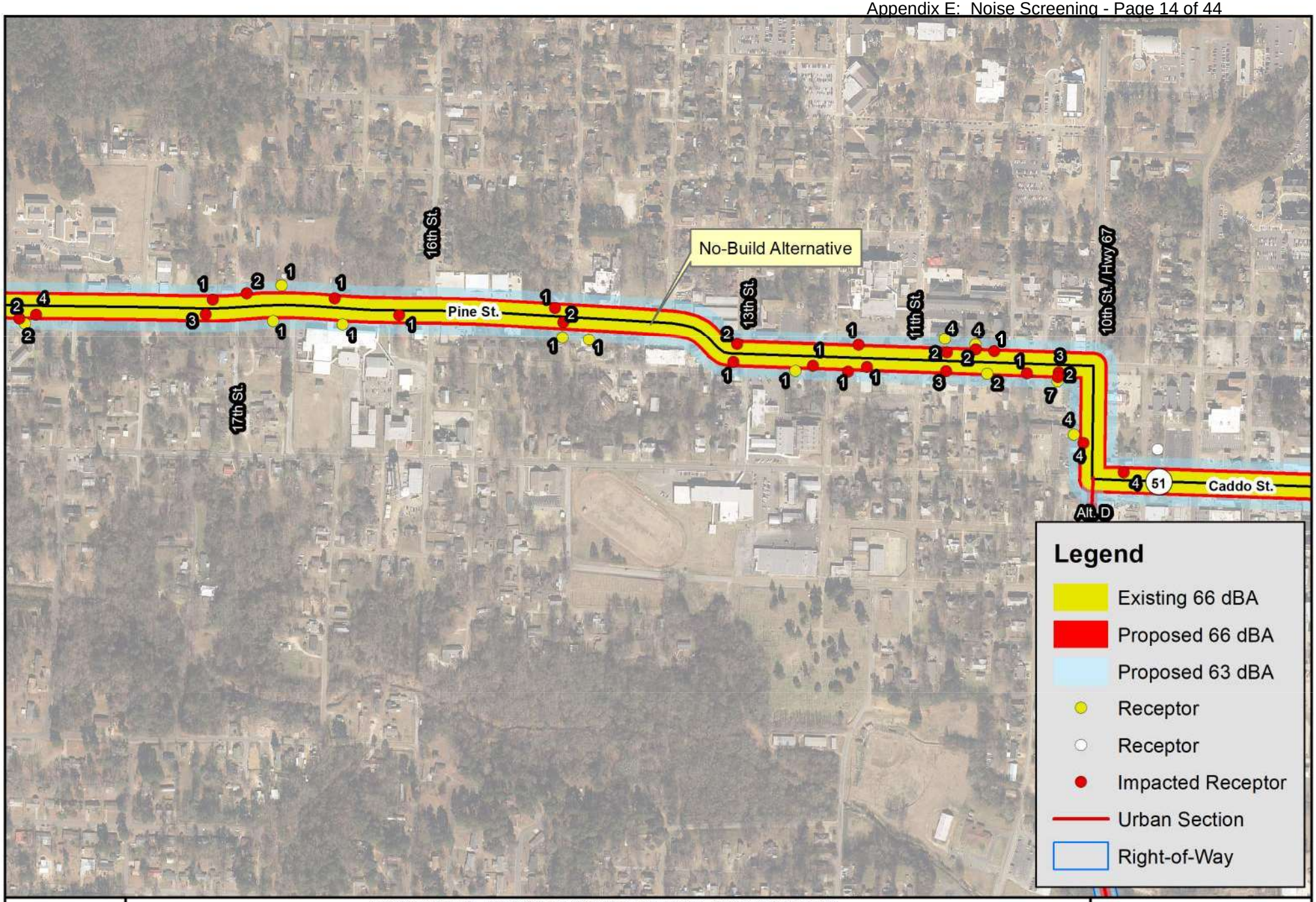
NOISE MEMO - 63 & 66 dB CONTOUR LINES - DETAILED VIEW

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

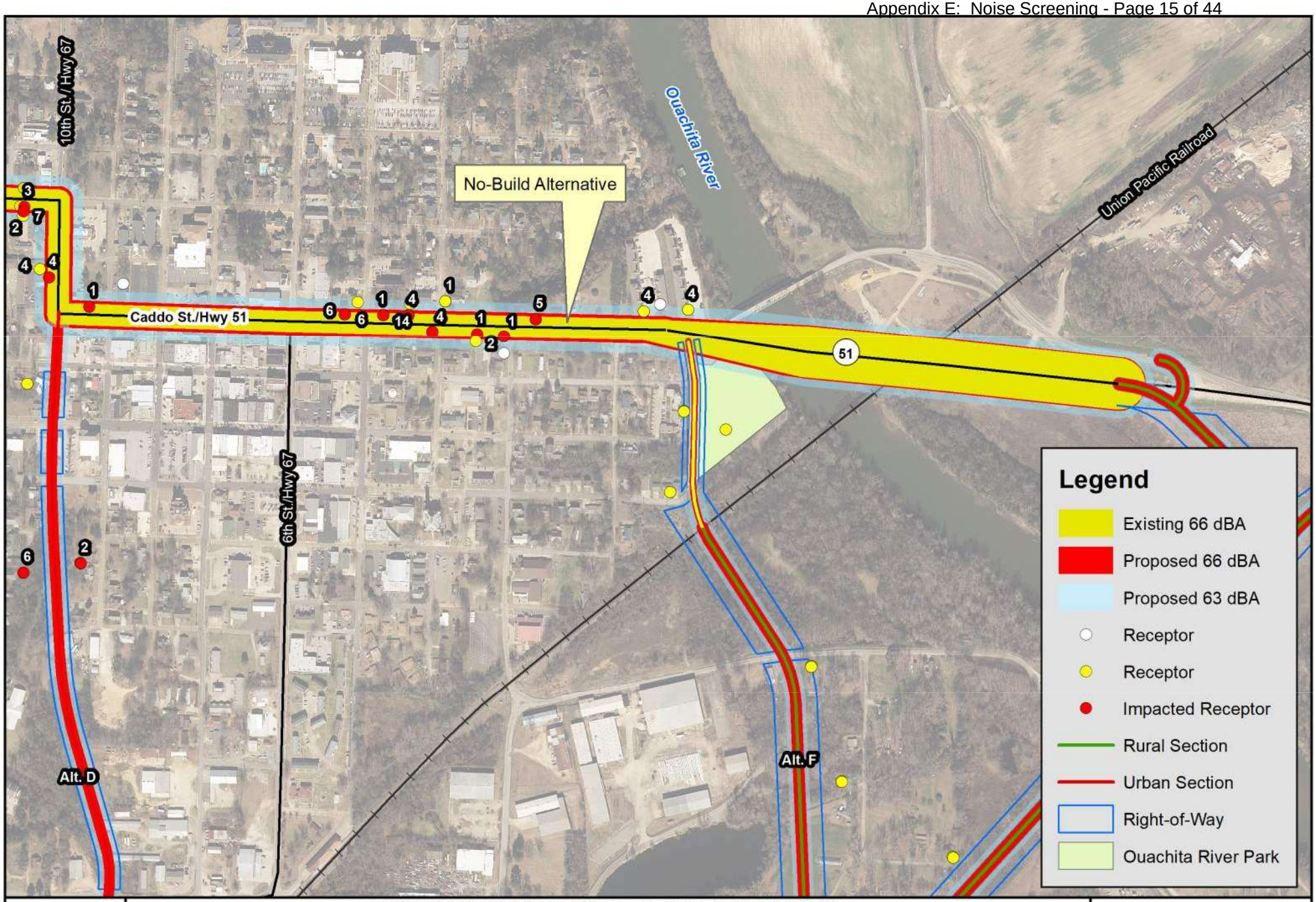
2017 Aerial Image; ARKANSAS GIS OFFICE

GARVER

N

0 200 400 600 800
Feet

Figure 3



GARVER

N

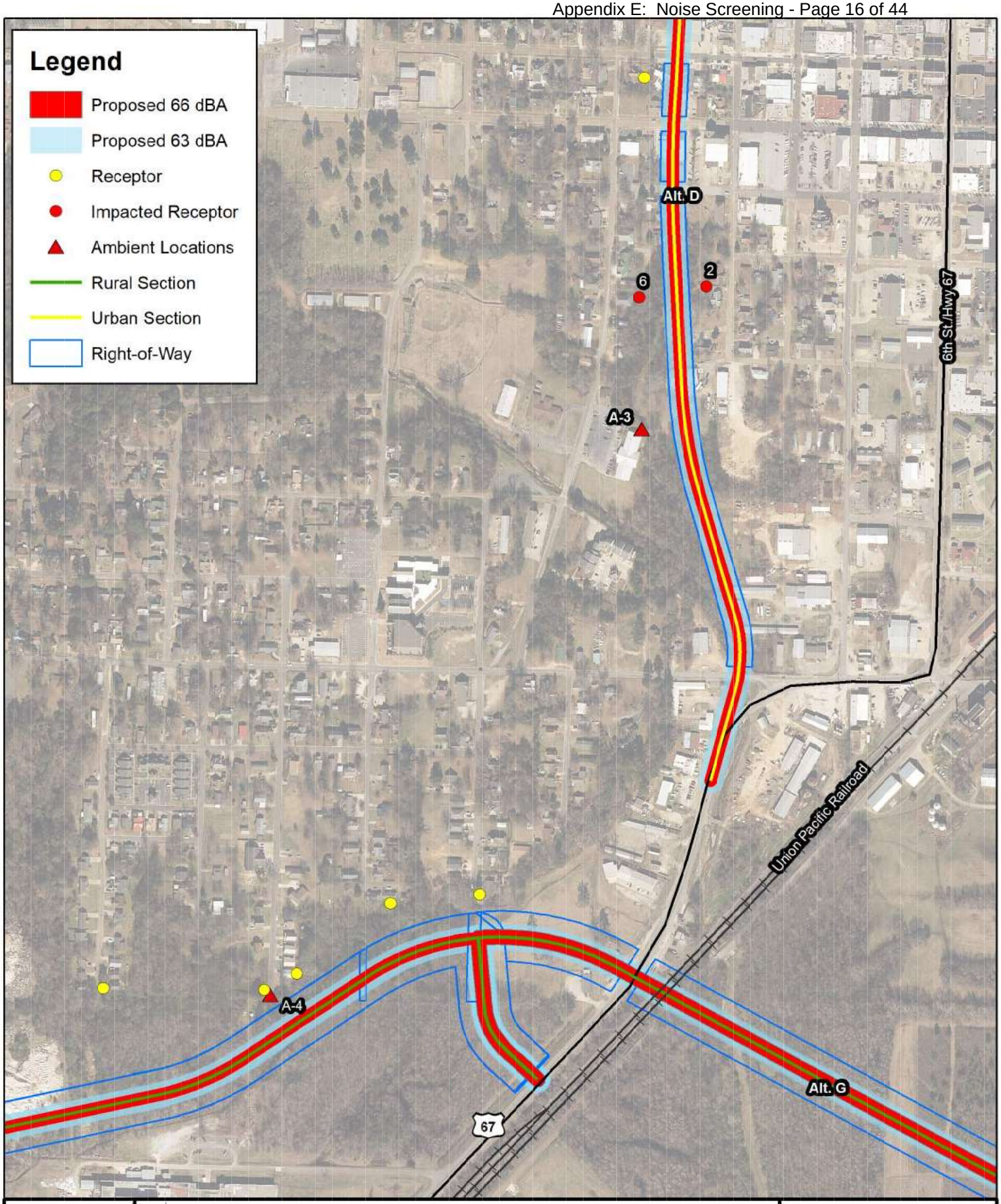
NOISE MEMO - 63 & 66 dB CONTOUR LINES - DETAILED VIEW

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

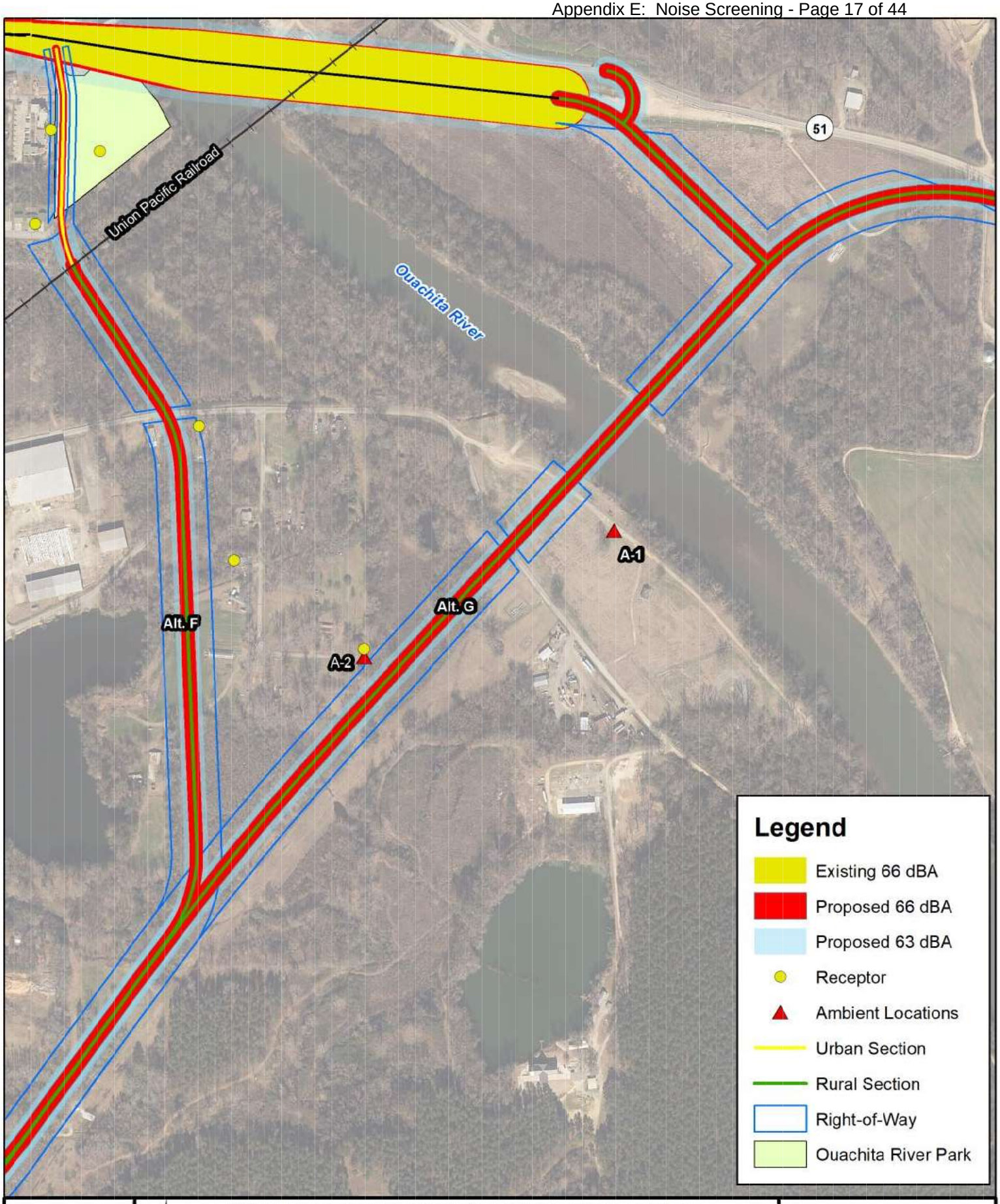
NOISE MEMO - 63 & 66 dB CONTOUR LINES - DETAILED VIEW

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

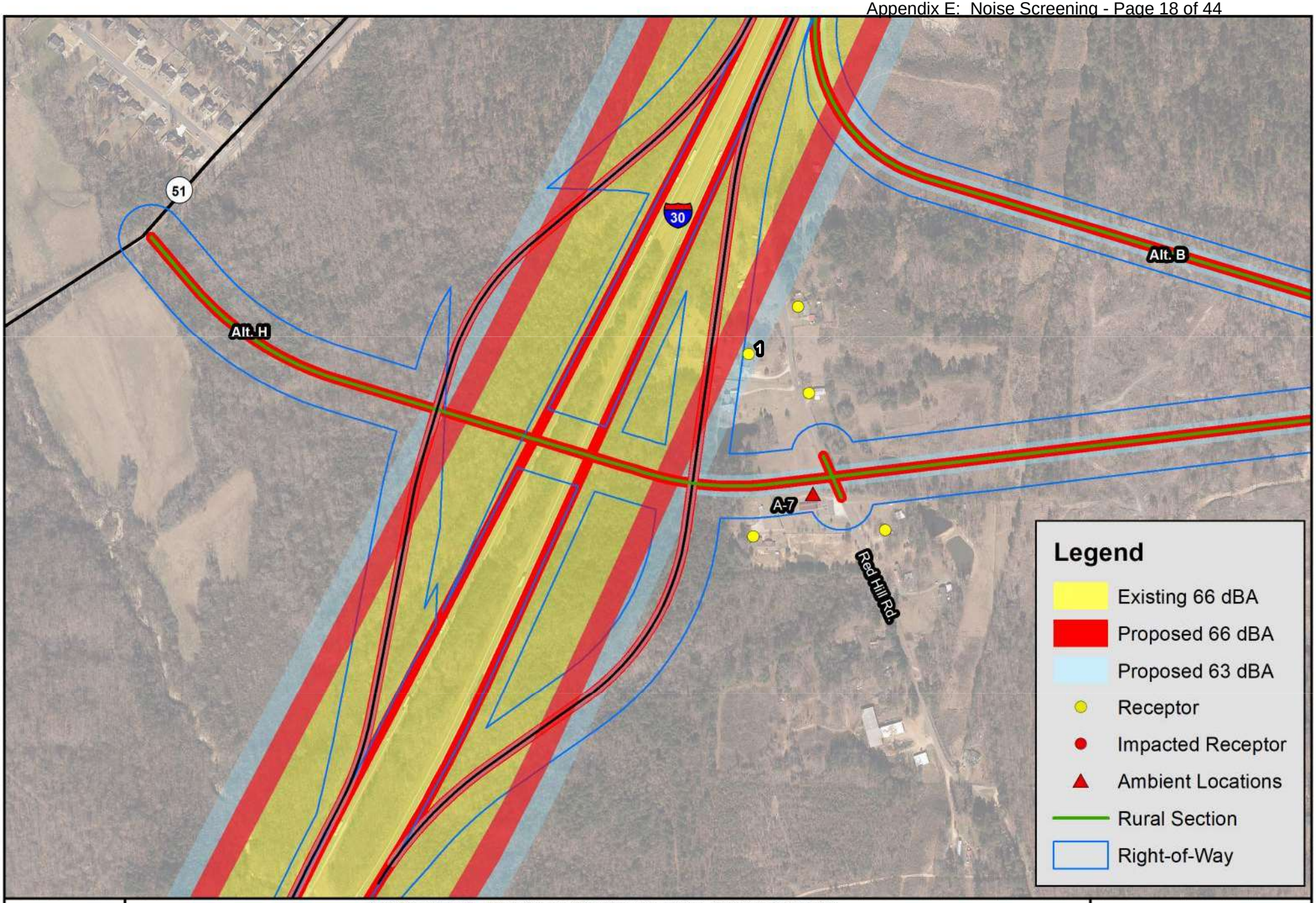
NOISE MEMO - 63 & 66 dB CONTOUR LINES - DETAILED VIEW

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

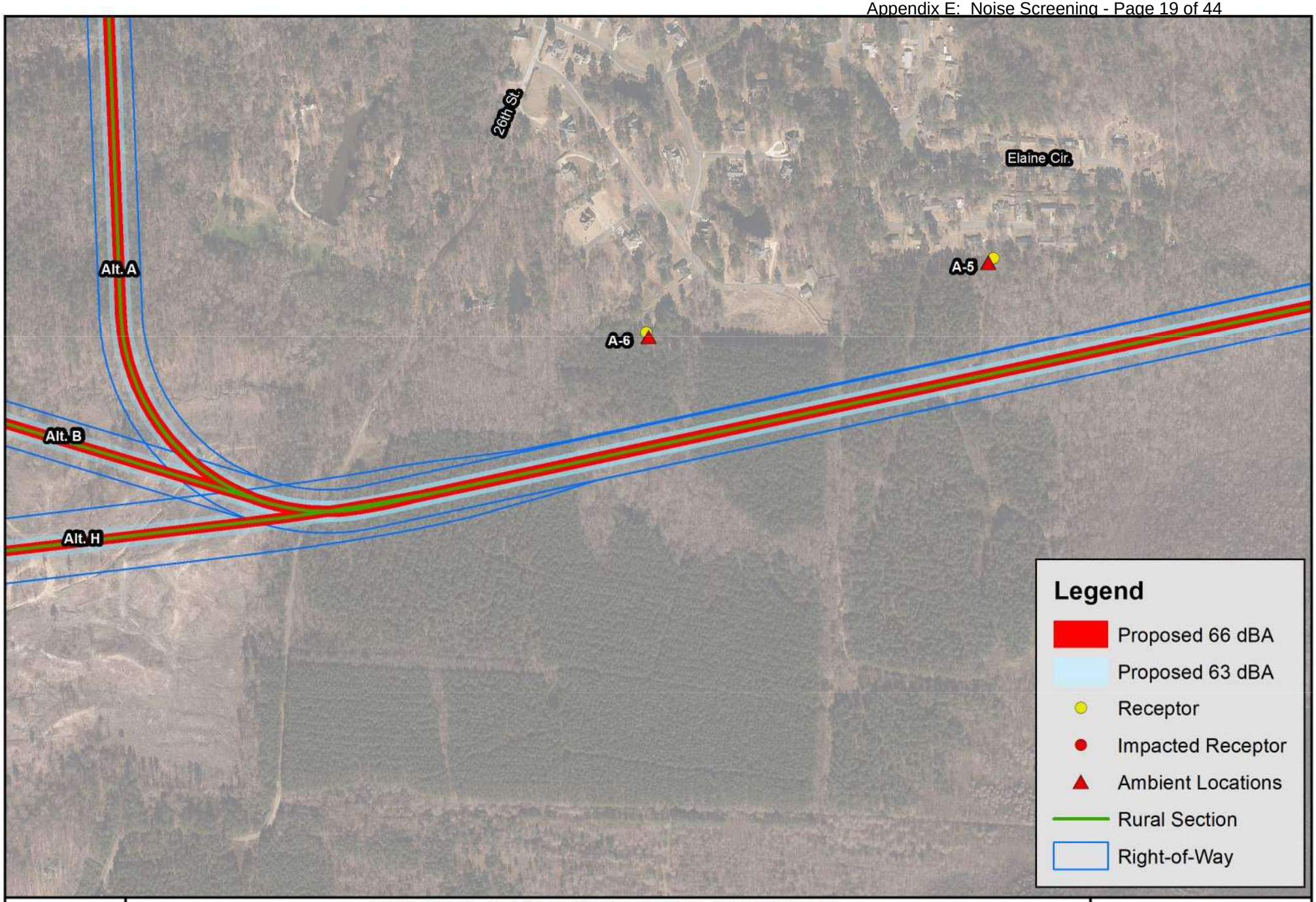
NOISE MEMO - 63 & 66 dB CONTOUR LINES - DETAILED VIEW

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

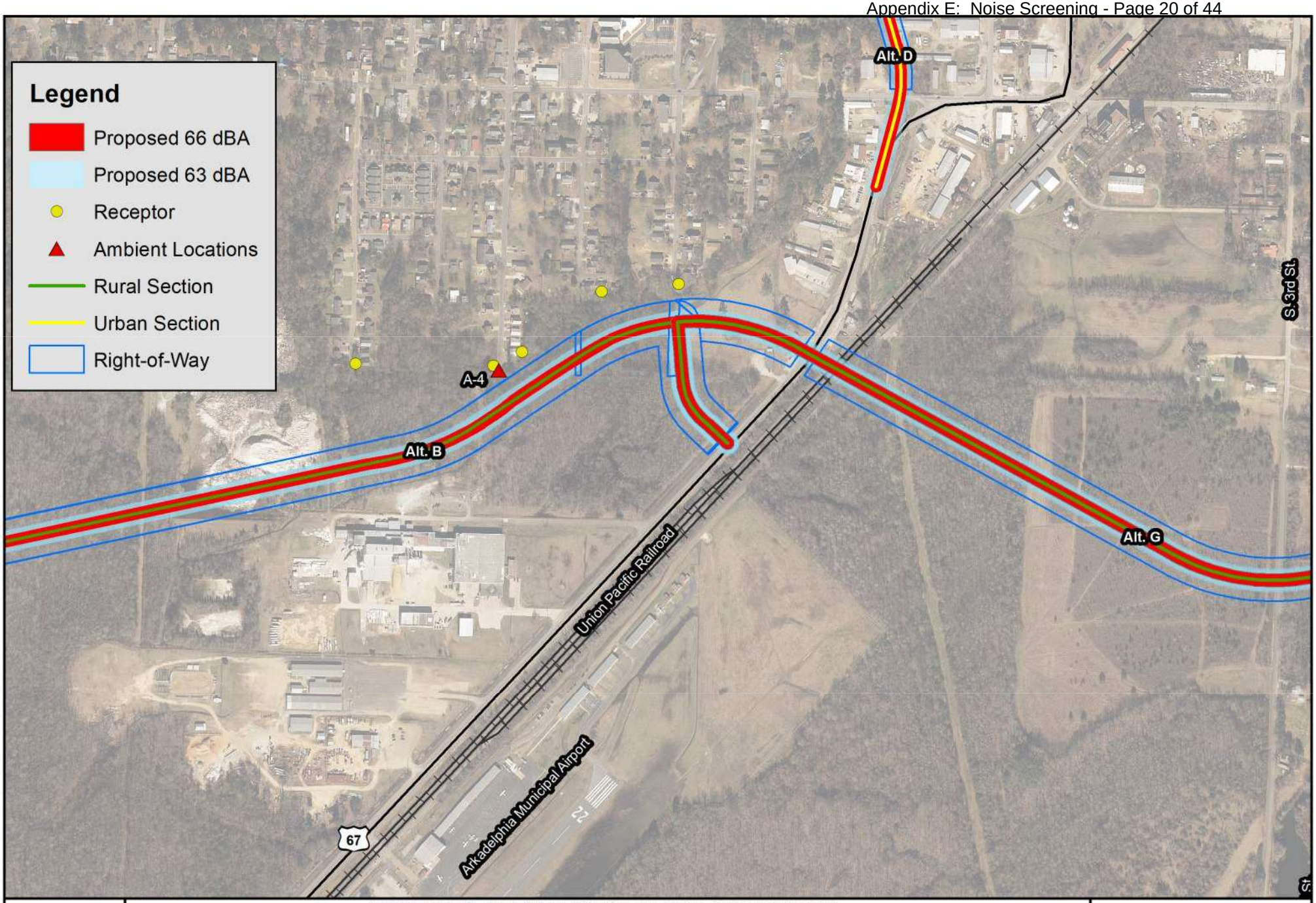
NOISE MEMO - 63 & 66 dB CONTOUR LINES - DETAILED VIEW

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	Crit'n	Increase over existing	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
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
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	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
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

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	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

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
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

Note: DHV = (ADT)(K)
DDHV = (ADT)(K)(D)
K - Percent of ADT occuring in design hour
D - Directional Distribution

2040	PROPOSED	

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		Increase over existing		Type Impact	With Barrier			
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc		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

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	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

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
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

Operating Speed: 45

Note: DHV = (ADT)(K)
DDHV = (ADT)(K)(D)
K - Percent of ADT occuring in design hour
D - Directional Distribution

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

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	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.

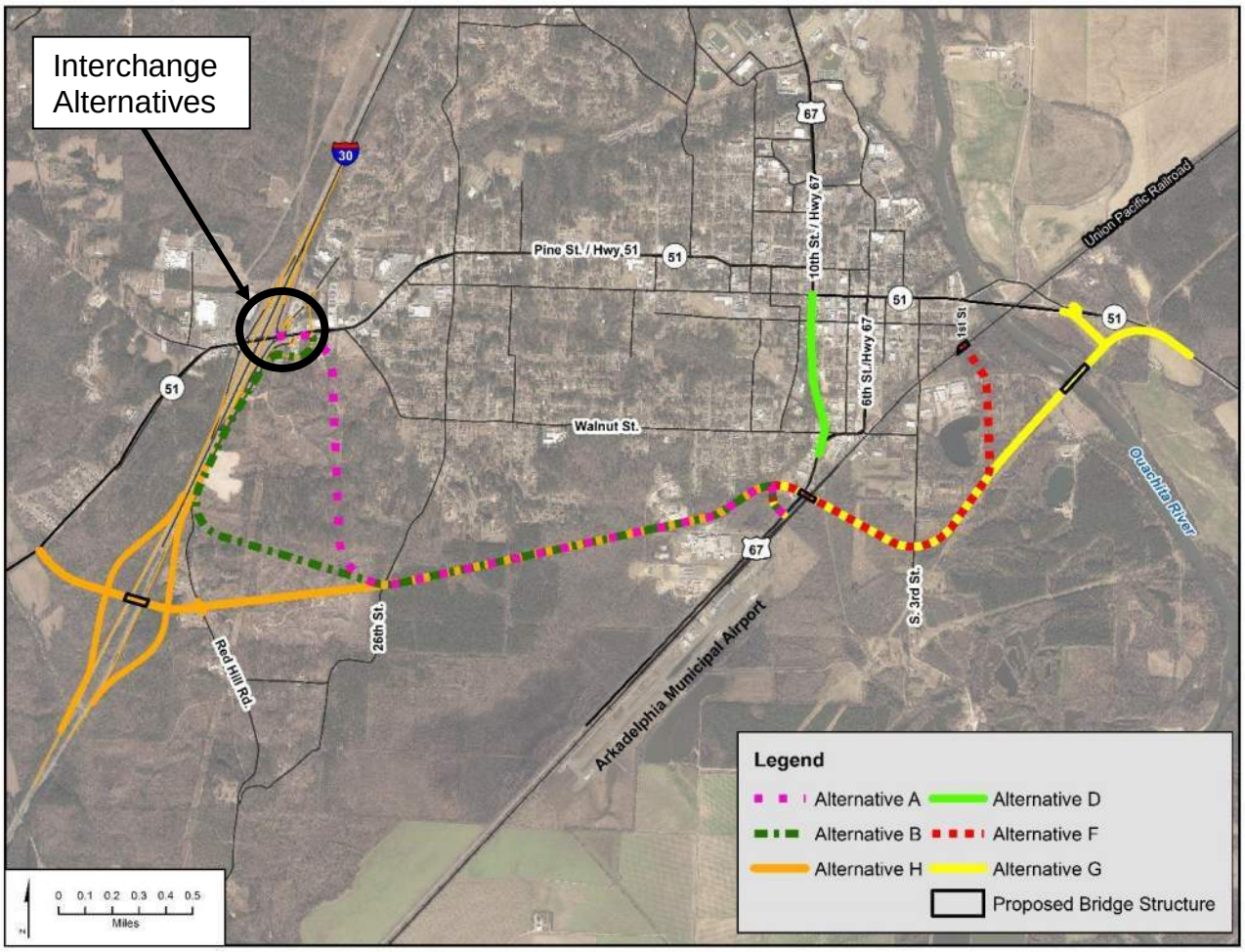
Proposed project viewers are categorized as either neighbors or travelers. Neighbors include residents and business occupants. Travelers include users of the project corridor and adjacent roadways.

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

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.

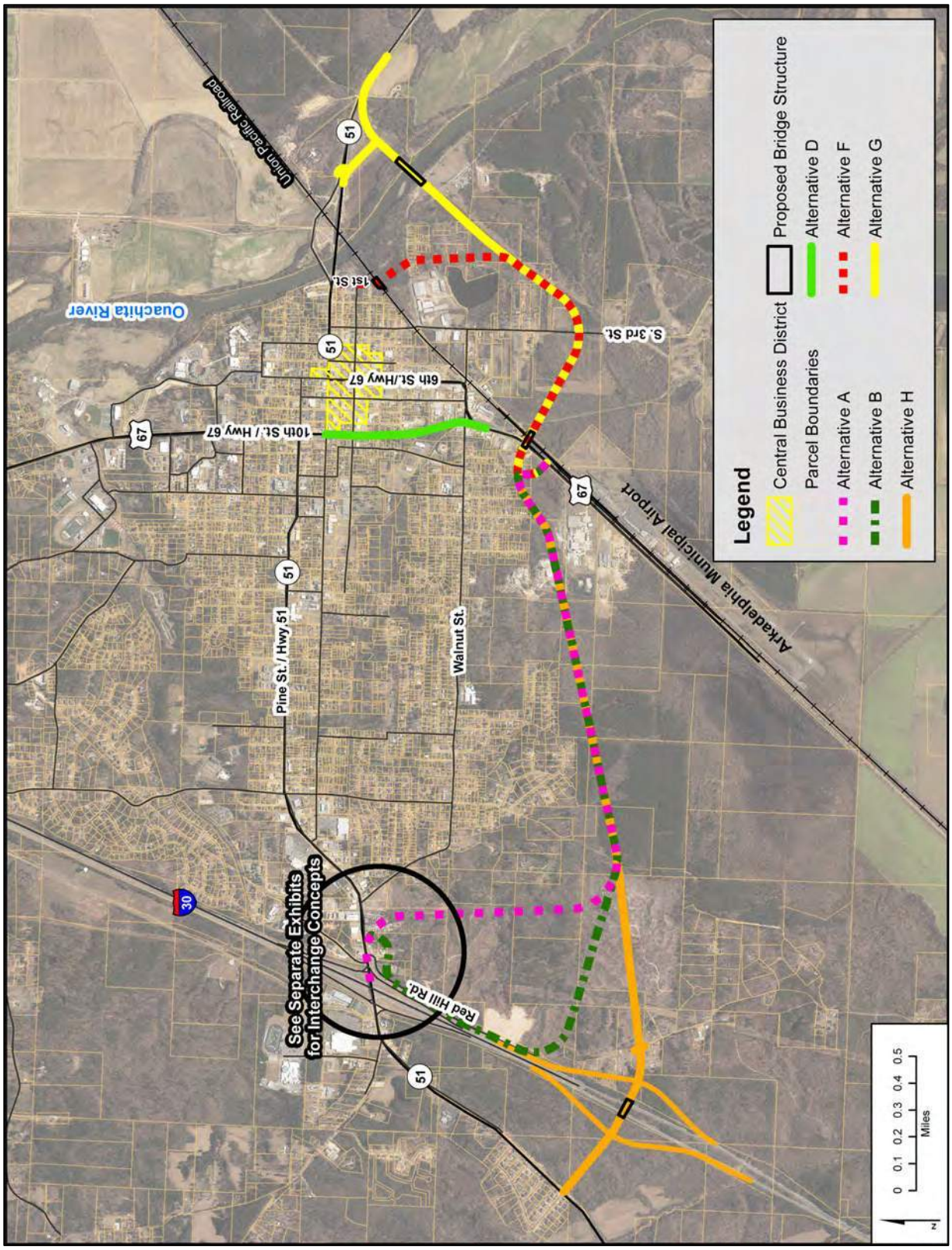


Figure 1-01. Arkadelphia South location map (courtesy: Garver).

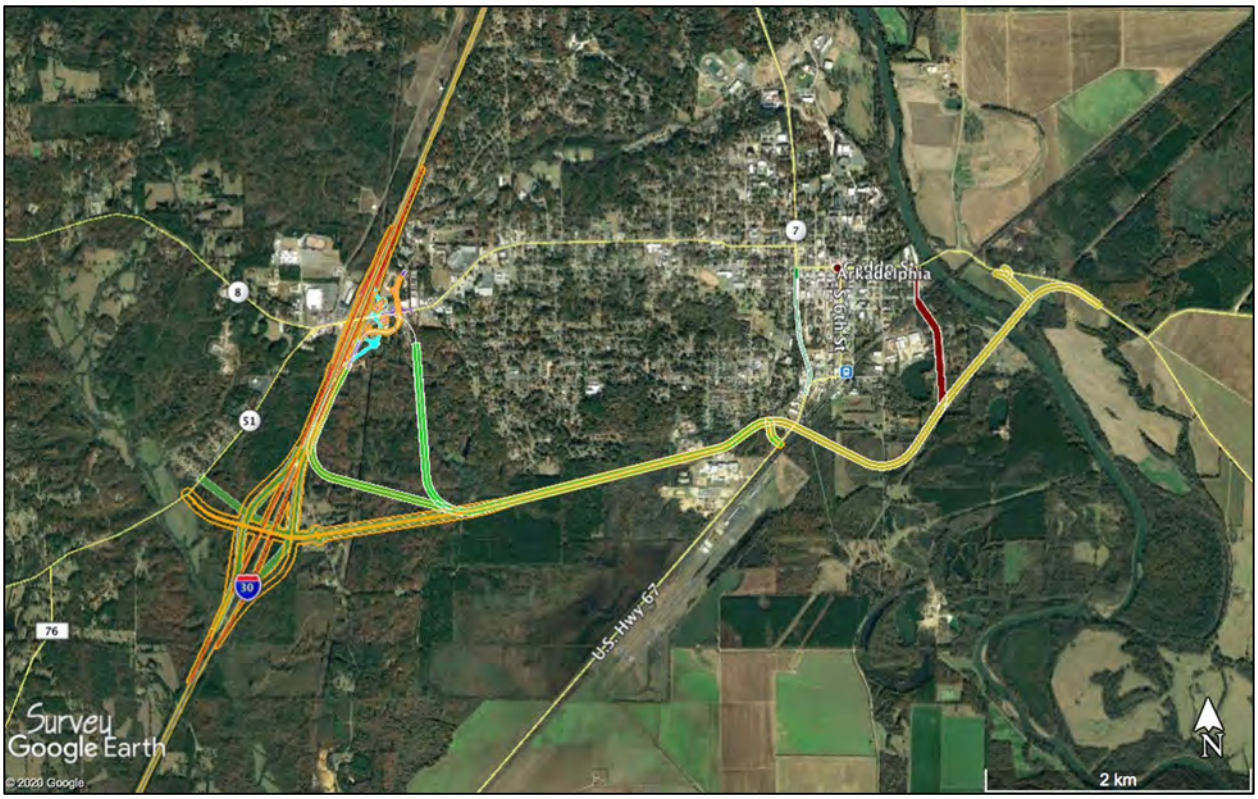


Figure 1-02. Arkadelphia South location map with Alternative H interchange modifications.

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).

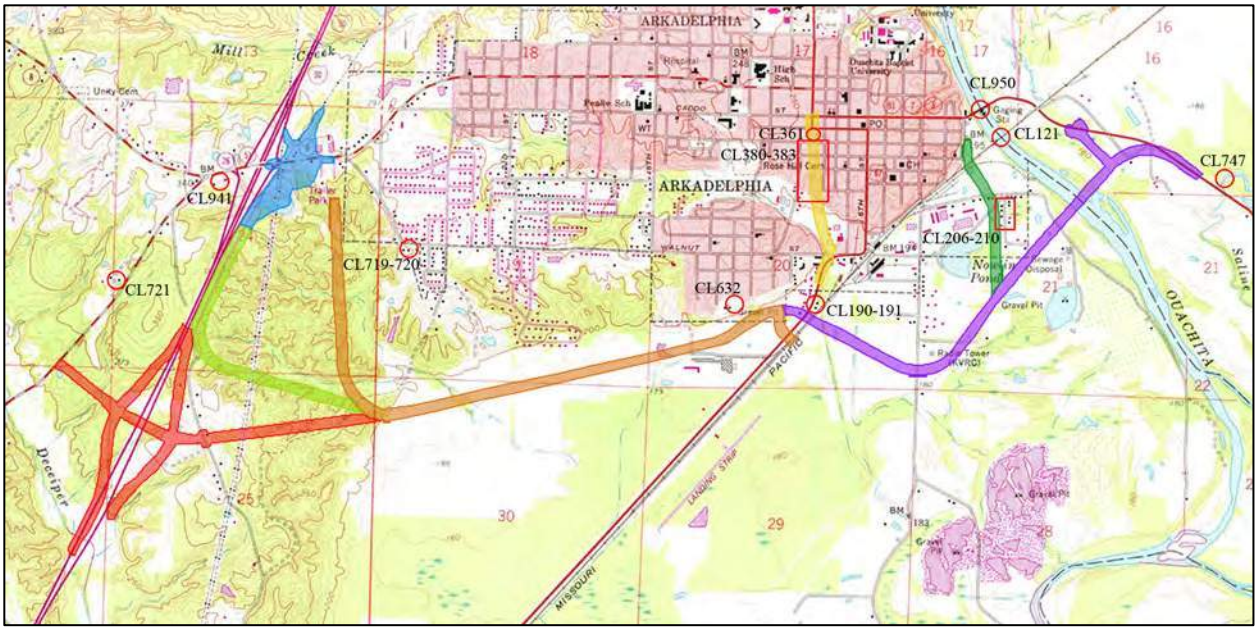


Figure 1-08. Previously recorded AHPP properties in the project area, Arkadelphia 7.5-minute USGS quadrangle.

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

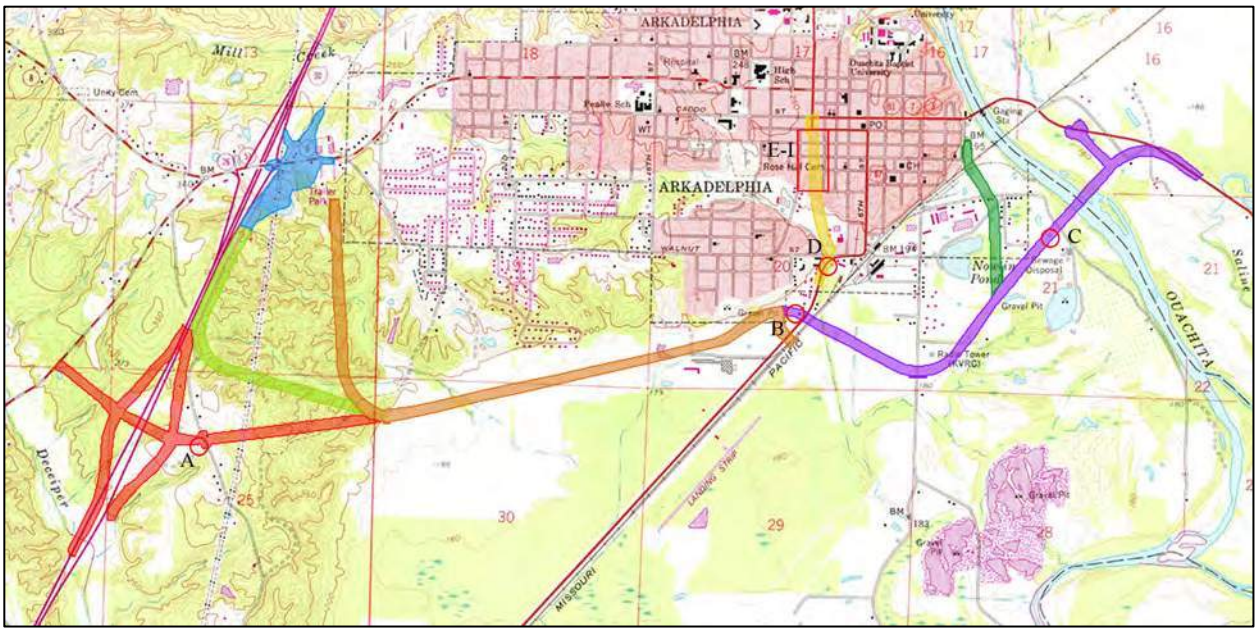


Figure 2-01. Distribution of structures >50 years old on the Arkadelphia, AR 7.5-min. quad.

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).

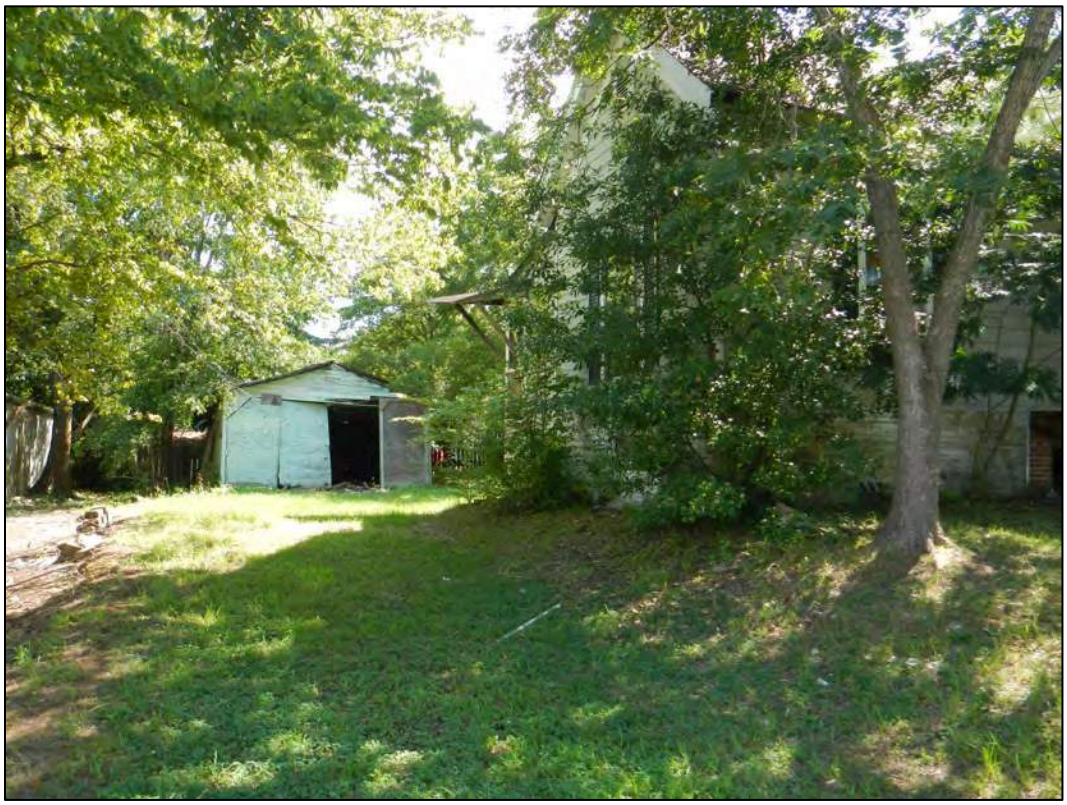


Figure 2-43. Structure H back-building, view south (DSCN1379).

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:

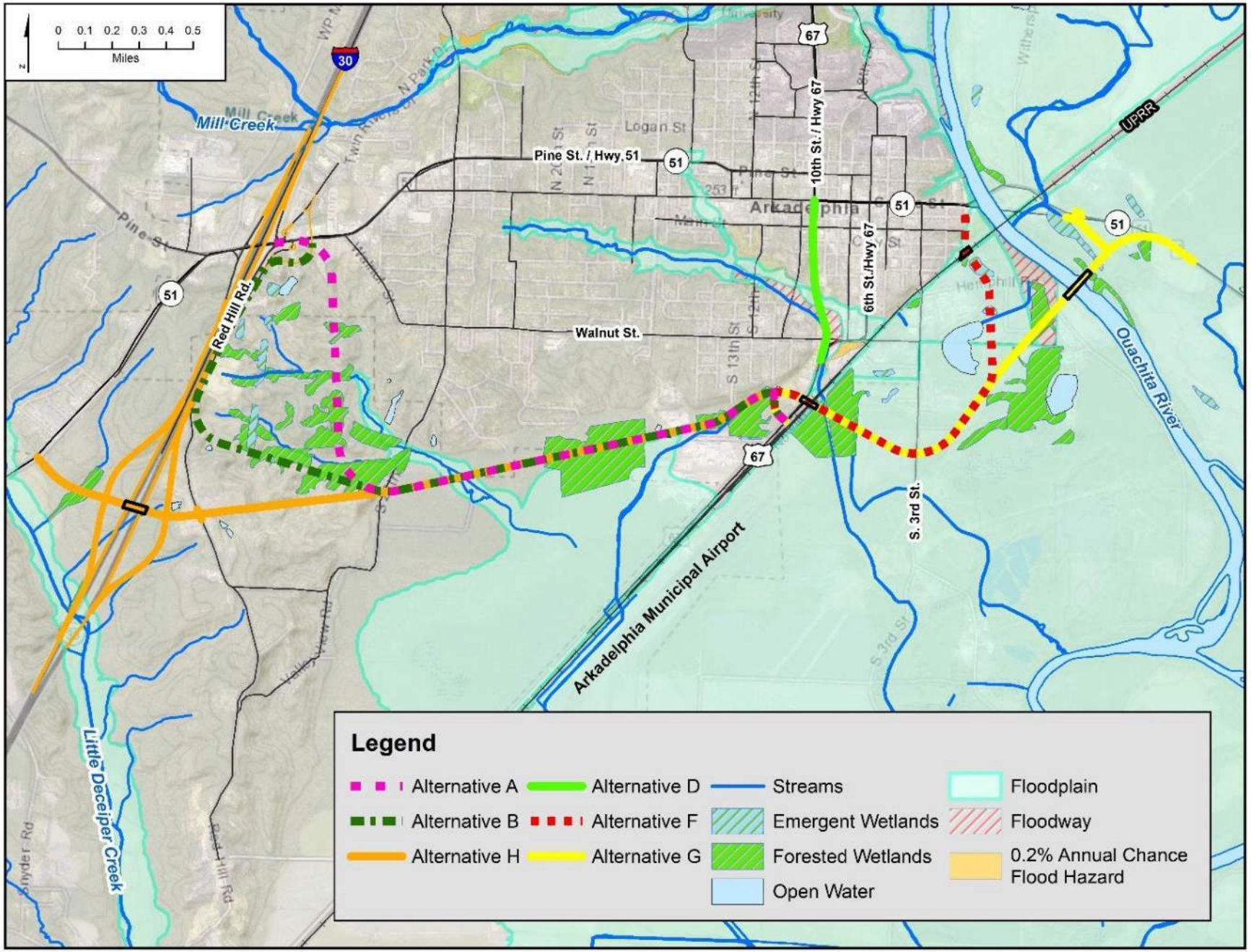
- An alternate route to reduce the number of logging and other heavy-duty trucks traveling through the downtown area;
- A more direct east-west travel route for both local and through traffic; and
- I-30/Hwy. 51 interchange modifications to reduce traffic congestion and increase emergency vehicle access 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/IntLeastTernFactSheet.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 = E/SA **Threatened (or Endangered) because of similarity of appearance.**

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.

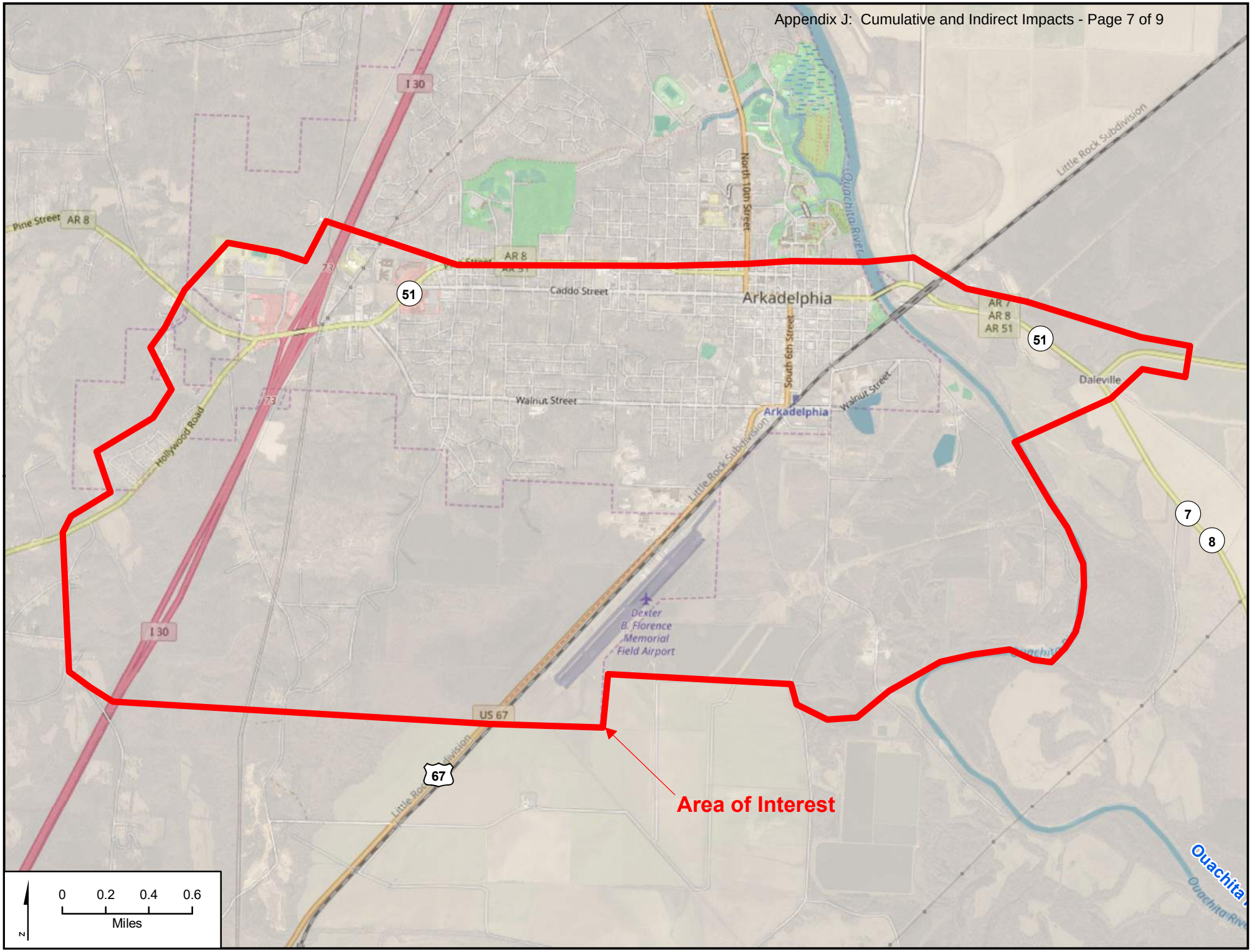
Ultimately, the primary information I need to know is if you know of any large, "*reasonably foreseeable*" (see definition in attached questionnaire) developments occurring within Arkadelphia within the next 20 years. Please feel free to mark those future developments on a map or send me information 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.

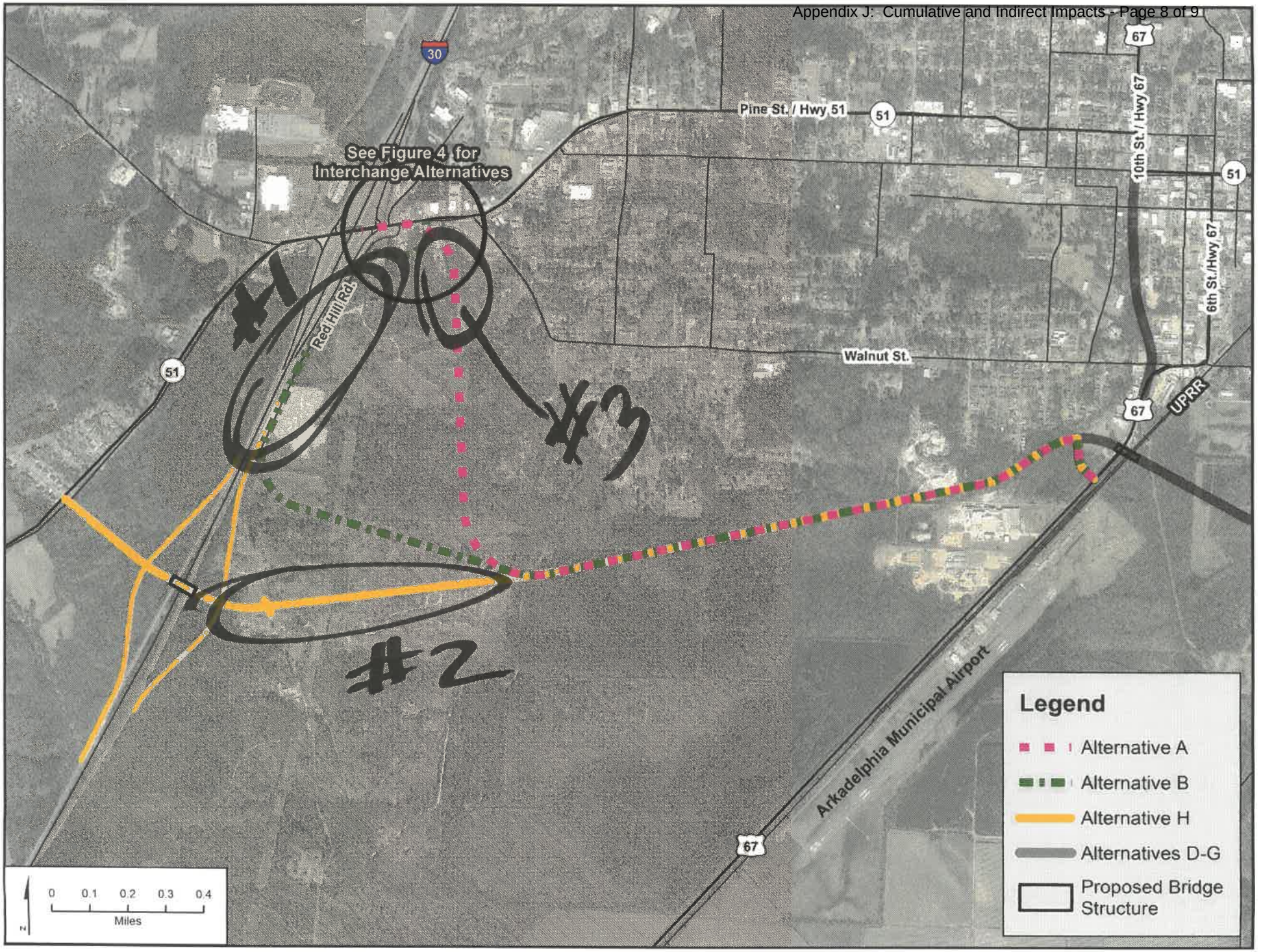
Please call or email me if you have any questions. My office number is listed below or you can reach me anytime on my cell phone (#918-440-2886). Thank you in advance for your time and assistance!

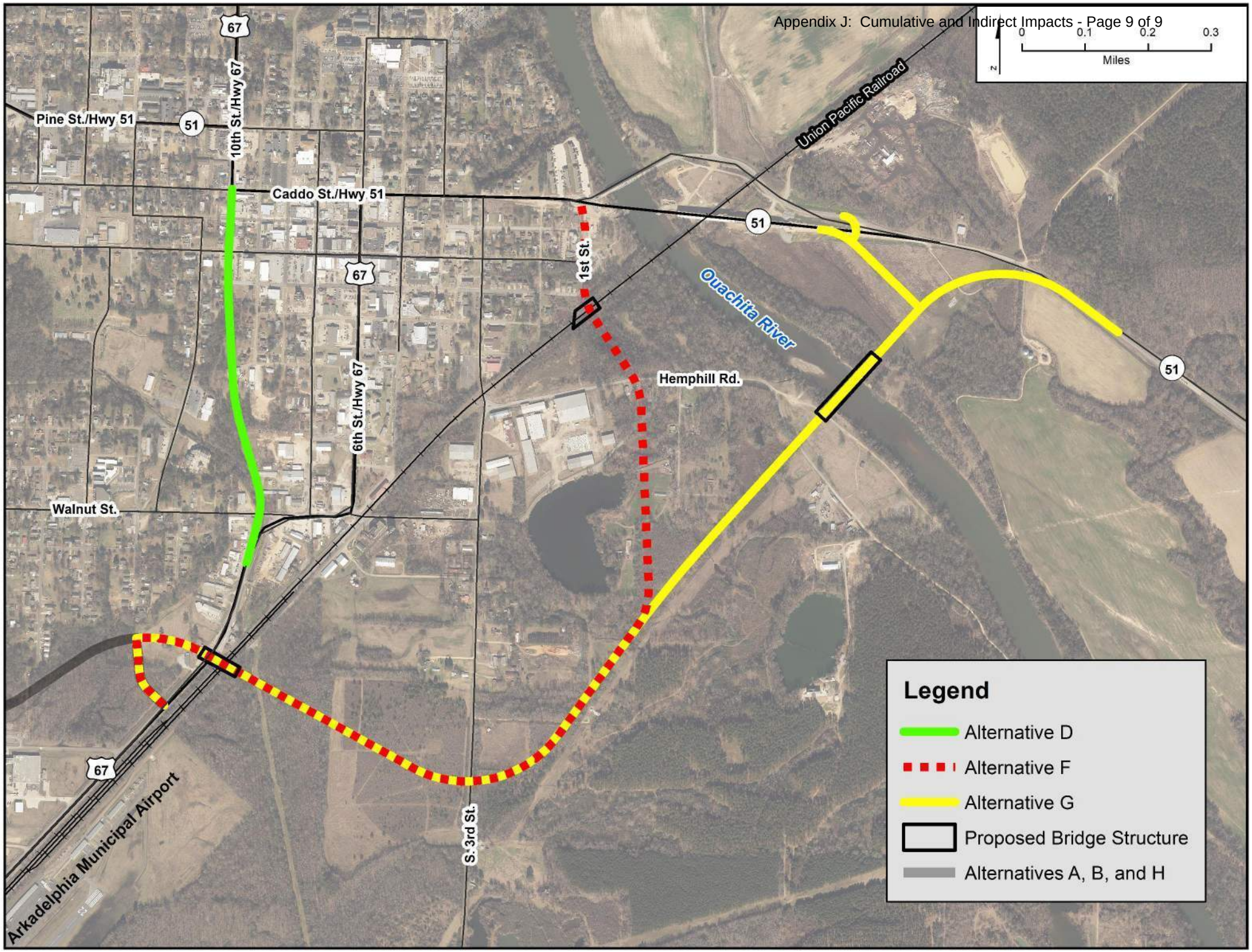
Sincerely,

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
73
7
8
Dexter
B. Florence
Memorial
Field Airport
US 67
67
Area of Interest
0
0.2
0.4
0.6
Miles
N


See Figure 4 for Interchange Alternatives
#1
#2
#3
30
51
67
Pine St. / Hwy 51
10th St. / Hwy 67
6th St./Hwy 67
Walnut St.
Red Hill Rd.
UPRR
Arkadelphia Municipal Airport
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