

ARKANSAS DEPARTMENT OF TRANSPORTATION

Little Rock, Arkansas

April 10, 2019

M E M O R A N D U M

TO: Highway Commission

SUBJECT: Draft Highway 72 Improvement Study
Benton County

Minute Order 2016-008 authorized a study to determine the need for and feasibility of improvements to Highway 72 between Interstate 49 in Bentonville and Pea Ridge in Benton County.

Attached is an executive summary of the draft study that has been completed by the Department. The development of this study has included review by Department staff and administration, the Federal Highway Administration, and local officials.

We plan to submit a Minute Order to adopt this study for your consideration at the May 1 Commission meeting.

Should you have any questions or comments, please advise.



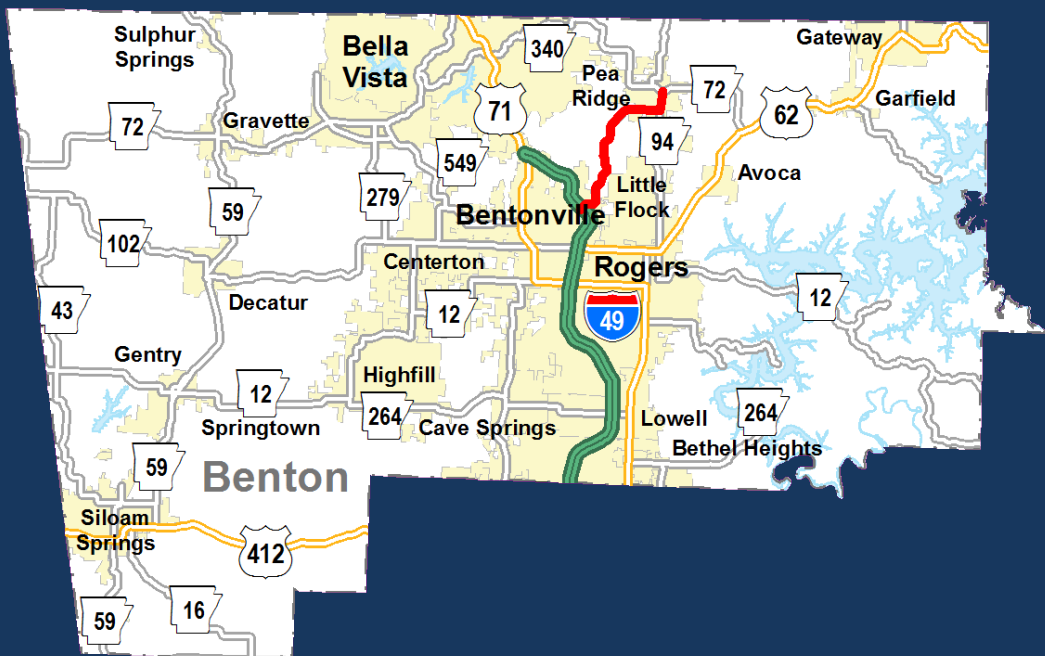
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Attachment (1)

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District 9

HIGHWAY 72 IMPROVEMENT STUDY

INTERSTATE 49 IN BENTONVILLE TO PEA RIDGE BENTON COUNTY



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INTERSTATE 49 IN BENTONVILLE TO PEA RIDGE BENTON COUNTY



Prepared by the Transportation Planning and Policy Division
Arkansas Department of Transportation
In Cooperation with the Federal Highway Administration

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ARKANSAS DEPARTMENT OF TRANSPORTATION

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INTRODUCTION

Highway 72 is an east-west minor arterial that connects Bentonville and Pea Ridge in northwest Arkansas, a distance of approximately 7.6 miles. As part of the Arkansas Primary Highway Network (APHN), Highway 72 serves as an important route in this fast growing area. Bentonville is an expanding city with numerous major employers, while Pea Ridge is a suburban community that provides residences for those who work in the Bentonville area. Highway 72 serves as the primary route for commuters between the two cities, and travel delay induced by rapid growth in the area has raised concerns.

At the request of local officials, the Arkansas State Highway Commission adopted Minute Order 2016-008 (Appendix A), authorizing a study of needed improvements to Highway 72 between Interstate 49 in Bentonville and Pea Ridge. The study area is shown in Figure 1.

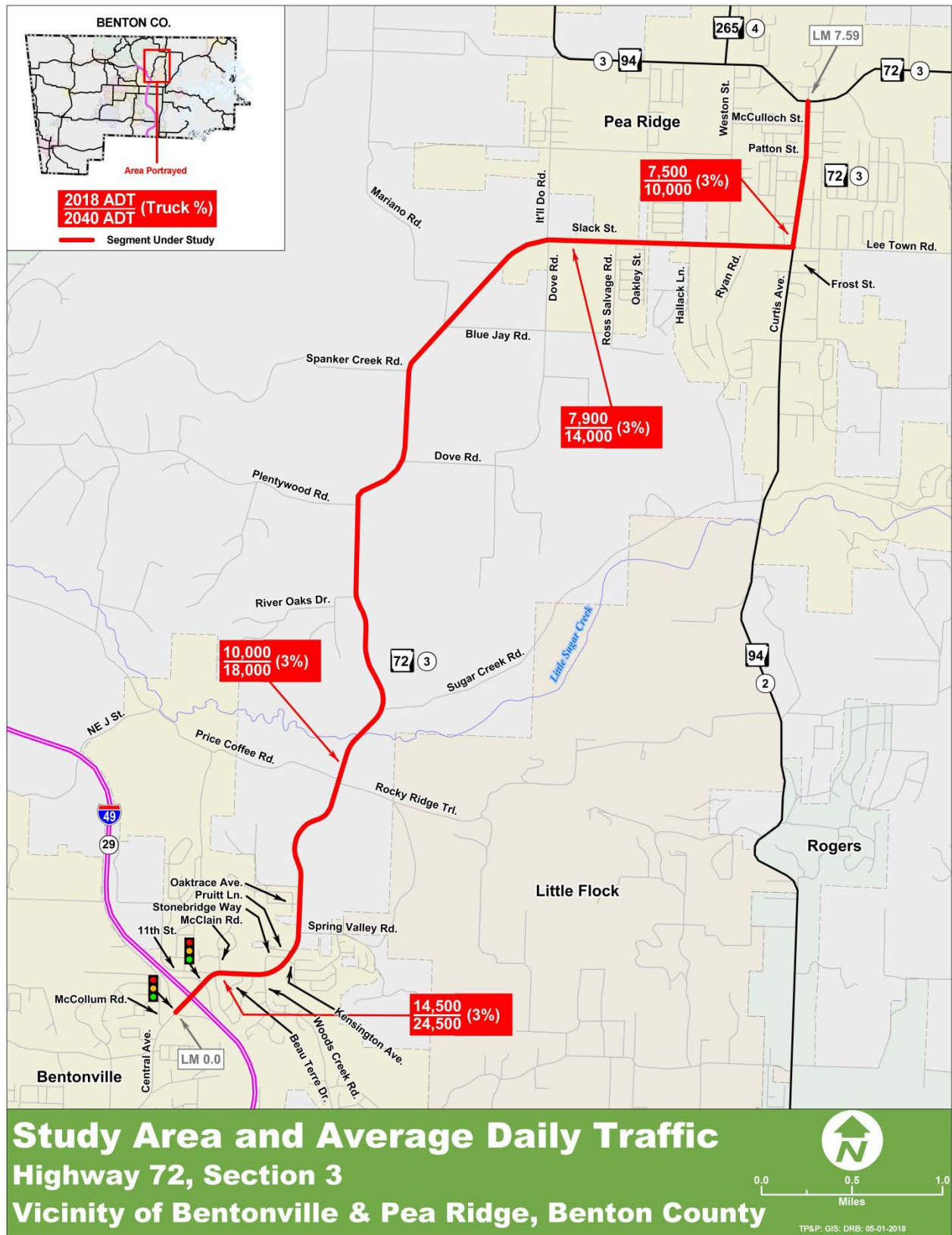
PURPOSE AND NEED

The purpose and need for improvements to Highway 72 between the Interstate 49 interchange in Bentonville and the Highway 94 North intersection in Pea Ridge have been examined. The findings are as follows.

EXISTING CONDITIONS

Highway 72 is a two-lane minor arterial with 11- and 12-foot travel lanes, mostly minimal shoulders, and speed limits ranging from 30 to 55 miles per hour (mph). It is the primary route connecting Pea Ridge to major employers, such as the headquarters of Walmart, Inc. in Bentonville. Current and future traffic volumes are shown on Figure 1.

Figure 1 - Study Area and Average Daily Traffic (ADT)



Pea Ridge is a thriving residential community and home to the Pea Ridge National Military Park. According to Census Transportation Planning Products (CTPP) data, over 75 percent of workers in Pea Ridge commute toward Bentonville, resulting in traffic flows that are highly unbalanced during peak hours of the day on Highway 72.

The study area contains hilly terrain with numerous curves and grades of up to eight percent. The terrain has limited the construction of alternative routes, which concentrates traffic onto Highway 72. Land use along Highway 72 is rural except near the Interstate 49 interchange and in the business district of Pea Ridge.

Other routes in the area include Highway 94 and Highway 265. Highway 94 serves as the primary commuter route towards Rogers. Highway 265 is a lower volume route that connects Pea Ridge to rural southern Missouri.

Job CA0902 provided a partial clover-leaf configuration at the Interstate 49/Highway 72 Interchange, as recommended in the *I-540 Improvement Study* (2006). This reduced delays for westbound drivers traveling from Pea Ridge to Bentonville at the interchange during the morning peak. Job CA0902 also widened Highway 72 to four travel lanes between the interchange and Beau Terre Drive.

CURRENT TRANSPORTATION AND LAND USE PLANS

The Northwest Arkansas Regional Planning Commission (NWARPC) adopted the *2040 Metropolitan Transportation Plan* (MTP) in March 2016. The MTP Constrained Project List identified future projects to be funded, including the widening of Highway 72 from Interstate 49 to Little Sugar Creek by 2030 and to Pea Ridge by 2040. The MTP also discussed funding a new Interstate 49 interchange at J Street.

The *Bentonville Master Street Plan* indicates that Price Coffee Road, currently a two-lane, partially unpaved road, will become a divided four-lane arterial. This would

provide better access to the proposed Interstate 49/J Street Interchange, which would be located approximately 1.4 miles north of the Interstate 49/Highway 72 Interchange. Price Coffee Road and Rocky Ridge Trail would form a logical east-west arterial connecting to this interchange.

The Pea Ridge Public School District has plans for a new high school east of It'll Do Road, which is expected to generate more traffic in the area. At the request of Benton County, a southbound right-turn lane on It'll Do Road and an eastbound left-turn lane on Highway 72 has been installed at this intersection by District 9.

The City of Bentonville anticipates a new commercial development north of Highway 72 along 11th Street, which is expected to impact traffic operations at the interchange area.

TRAFFIC OPERATIONS ANALYSIS

Existing and forecast traffic operations were analyzed on Highway 72. This included a review of the Interstate 49 interchange and the Highway 94 intersections in Pea Ridge. Recently observed travel delay, particularly for westbound traffic during the morning peak period, was largely alleviated by Job CA0902. The analysis indicates that while operations are currently acceptable, they will worsen to unacceptable levels in the future between Beau Terre Drive and Highway 94 South by 2040. Both Highway 94 intersections in Pea Ridge will also operate at unacceptable levels in the future.

TRAFFIC SAFETY ANALYSIS

Crash data from 2012 to 2016, the most recent five years available, was analyzed and is shown in Table 1. The safety analysis concluded the following:

- Crashes occurred more frequently on curved segments, intersections, and in areas of higher traffic volumes as shown on Figure 2.

- Average crash rates were generally higher than the statewide averages between Interstate 49 and Pea Ridge.
- Approximately 24 percent of crashes occurred during wet conditions, which is higher than the statewide average of 16 percent.

Table 1 - Highway 72 Annual Average Crash Rates (2012-2016)

Route	Log Miles	Weighted ADT ¹	Total Crashes			KA Crashes		
			Number of Crashes	Crash Rate (per MVM) ²	Statewide Average (per MVM) ²	Number of Crashes	Crash Rate (per 100 MVM) ³	Statewide Average (per 100 MVM) ³
Highway 72 (Interstate 49 Interchange to Rocky Ridge Trail)	0.00 to 1.83	10,300	28.80	4.18	2.62 ⁴	1.60	23.09	11.73 ⁵
Highway 72 (Rocky Ridge Trail to It'll Do Road)	1.84 to 5.40	8,600	15.80	1.41	1.05 ⁶	3.00	27.24	14.88 ⁷
Highway 72 (It'll Do Road to Highway 94 South)	5.41 to 6.77	7,000	7.00	2.03	2.62 ⁴	0.40	12.93	11.73 ⁵
Highway 72 (Highway 94 South to Highway 94 North)	6.78 to 7.59	7,600	3.20	1.40	2.62 ⁴	0.20	9.03	11.73 ⁵

1 - Average Daily Traffic

2 - Crash rates reported in crashes per million vehicle miles (MVM)

3 - KA crash rates reported in crashes per 100 million vehicle miles (MVM)

4 - Statewide average crash rate for urban, two-lane highways (no access control)

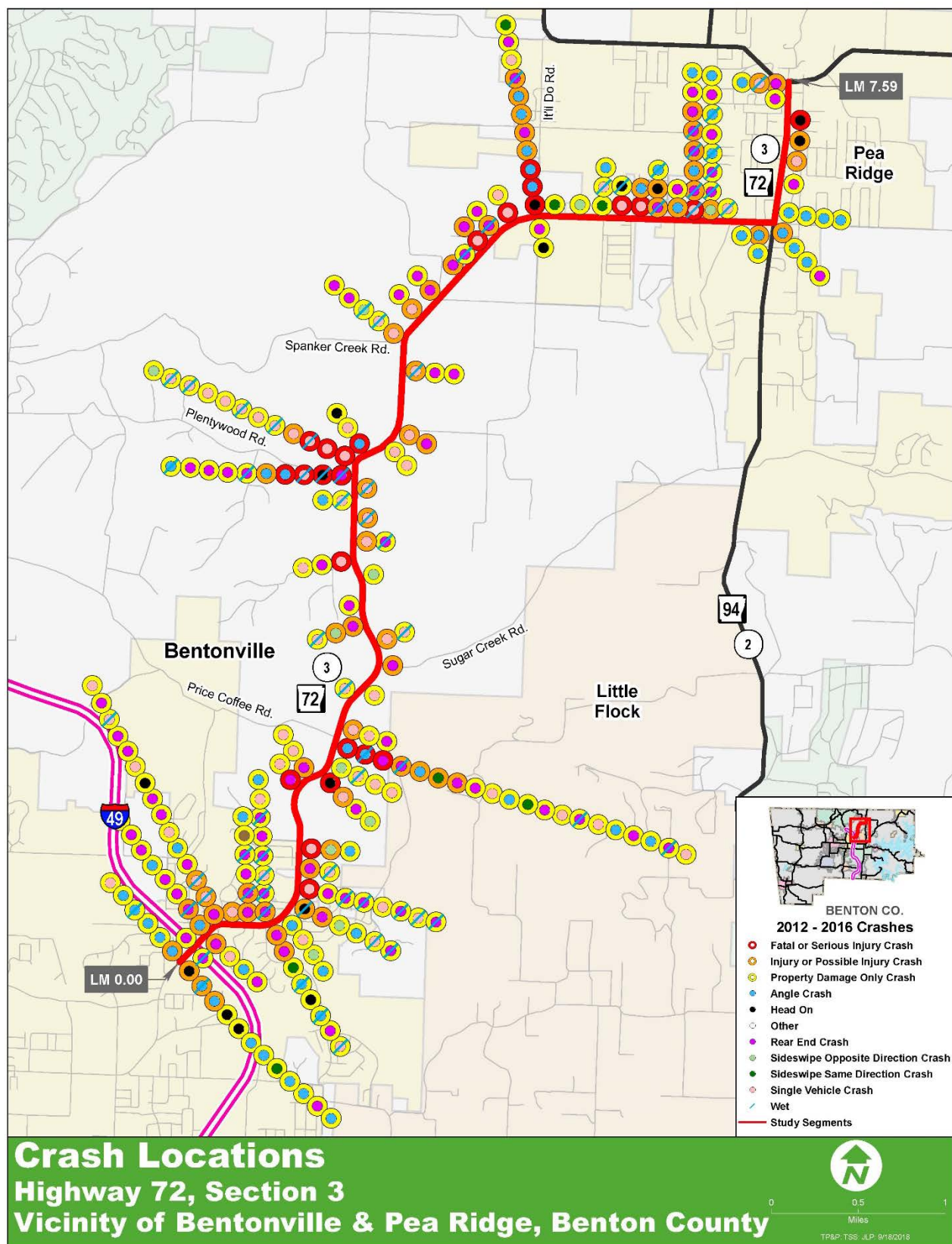
5 - Statewide average KA crash rate for urban, two-lane highways (no access control)

6 - Statewide average crash rate for rural, two-lane highways (no access control)

7 - Statewide average KA crash rate for rural, two-lane highways (no access control)

A high-friction surface treatment was placed in the curve near Plentywood Road in late 2016. The treatment reduced the number of wet crashes at this location from five in 2015 to one in 2017. However, 2017 crash data shows that wet crashes account for 26 percent of crashes on the corridor, and crash rates are still generally higher than the 2012-2016 statewide average west of Pea Ridge.

Figure 2 - Highway 72 Crashes



OTHER PLANNING CONSIDERATIONS

Infrastructure Conditions

Pavement and bridge conditions were reviewed for Highway 72. Pavement condition on Highway 72 in the study area is generally fair. All structures are in satisfactory condition.

Bicyclists and Pedestrians

There are currently no dedicated bicycle or pedestrian accommodations on Highway 72. The Bentonville and Northwest Arkansas (NWA) Regional Bicycle and Pedestrian Master Plans identify Highway 72 between Interstate 49 and Sugar Creek Road as a proposed on-road bicycle route. The inclusion of bike lanes would provide a connection between the Razorback Regional Greenway and Pea Ridge National Military Park, which is located east of Pea Ridge on US Highway 62.

Freight

Due to the rugged terrain and residential nature of Pea Ridge, Highway 72 is not considered a major freight route. Trucks range between two to three percent of the total daily volume, and mainly consist of light commercial trips.

Transit

Fixed-route transit is presently not provided anywhere in the study area.

Access Management

Because the number and type of access points impact the function of an arterial, access management is critical to safety and operational efficiency. Balancing the access needs of turning vehicles with those of through motorists ensures that a highway functions as it is intended, in this case as a minor arterial.

Highway 72 currently has no access control. Driveways are closely spaced, particularly near Interstate 49 and in central Pea Ridge. To alleviate such issues, common access management strategies on arterial corridors include:

- Providing a connected street network to reduce the need for arterial turns
- Maintaining appropriate traffic signal spacing
- Encouraging property owners to share access
- Installing a raised median to consolidate left turns to well-designed locations

Access management is particularly critical near the Interstate 49 Interchange. The *Access Management Manual* (2nd Edition), published by the Transportation Research Board, recommends a minimum ramp-to-driveway spacing of 990 feet and a minimum ramp-to-signal spacing of one-half mile. With ongoing land development near the interchange, traffic demand and the need for improved access will increase. As a result, any future access or traffic control requests within this area should be evaluated carefully, including a review of safety and operational impacts of the Highway 72 and Interstate 49 Interchange.

PURPOSE AND NEED SUMMARY

Residential development in Pea Ridge, paired with economic development in Bentonville, has led to increased traffic on Highway 72 during peak hours. This has resulted in diminishing the operational and safety performance of Highway 72. Completion of Job CA0902 has alleviated some of the issues in the short term, but further improvements will be needed to satisfy future year needs. For this reason, capacity and safety improvements were developed to address this demonstrated purpose and need.

ALTERNATIVES ANALYSES

Based on the evaluation of the existing conditions and future transportation needs, an improvement alternative for Highway 72 was developed and evaluated.

DESCRIPTION OF ALTERNATIVES

No-Action Alternative

This alternative would retain the existing two lanes, providing no improvements to operations or safety. As traffic volumes increase, operations will continue to deteriorate to unacceptable levels east of Beau Terre Drive. Increased travel times and diminishing safety performance would be expected. The No-Action Alternative has no associated cost other than routine maintenance.

Improvement Alternative

The Improvement Alternative includes short-term and long-term improvements, as shown in Figure 3. The short-term improvements are low cost strategies to address safety and operational needs. These include **intersection realignments** (Price Coffee Road/Rocky Ridge Trail and It'll Do Road/Dove Road), **construction of left turn bays** (Plentywood Road and Weston Street), **installation of ultra-thin bonded wearing course**, and **signing improvements**. Realigning Price Coffee Road and Rocky Ridge Trail is especially important because this is designated as a continuous arterial in Bentonville's Master Street Plan.

The long-term improvements include **widening existing Highway 72** to four travel lanes with a median between Beau Terre Drive and the Highway 94 South intersection, **realigning roadway curvature** as appropriate, and **improving the two Highway 94 intersections**. The median may consist of a continuous two-way left-turn lane or a

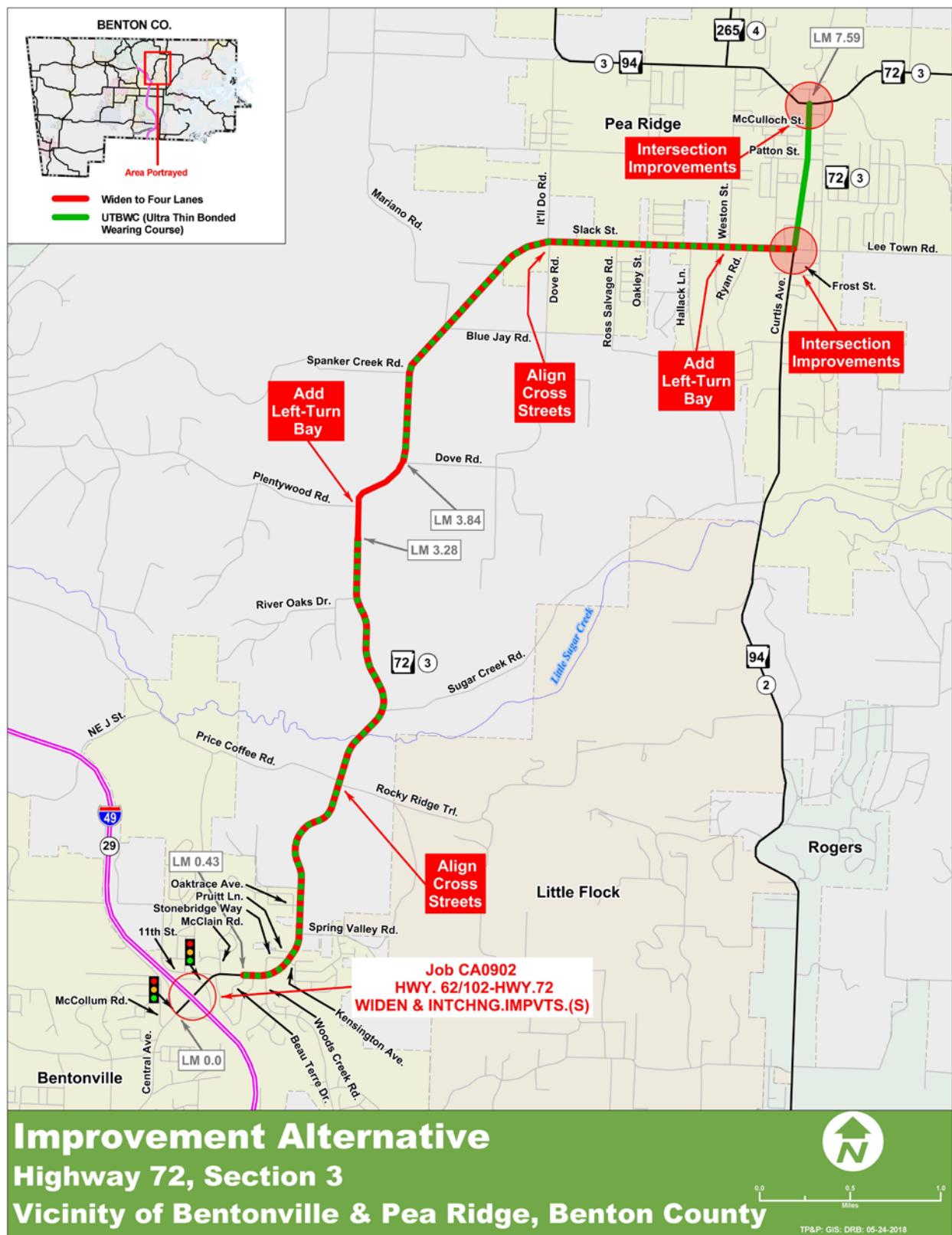


Figure 3 - Highway 72 Improvement Alternative

raised divided median with breaks at select intersections. Intersection improvements can be either traffic signals or roundabouts. Bicycle and pedestrian accommodations should be considered in accordance with Department policy.

As a part of any project, an access management plan should be agreed upon by local jurisdictions to improve operations and safety. This plan may include strategies to restrict left turn movements, such as installing a raised median, or improving connectivity to reduce the need for access. Access management is particularly important in the vicinity of the Interstate 49 Interchange.

The Improvement Alternative would cost approximately \$57.3 million (2018 dollars), of which \$44.4 million are construction costs. The total cost includes preliminary engineering, right of way acquisition, utilities relocation, construction, and construction engineering.

ANALYSIS OF IMPROVEMENT ALTERNATIVE

Operational Performance

An operational analysis of the corridor was conducted using current and future (2040) traffic volumes. The Improvement Alternative would provide acceptable operations on Highway 72 through the study period.

Safety Performance

Major widening would include wider shoulders, which may reduce vehicle departure crashes. Roadway geometry modifications under the Improvement Alternative could enhance safety by reducing curvature and providing more sight distance. Improving signage and trimming trees could also mitigate the visual challenges along the corridor. Providing a refuge for left turns through a continuous two-way left-turn lane, or through a raised median with openings at select intersections, will reduce the risk for rear-end crashes.

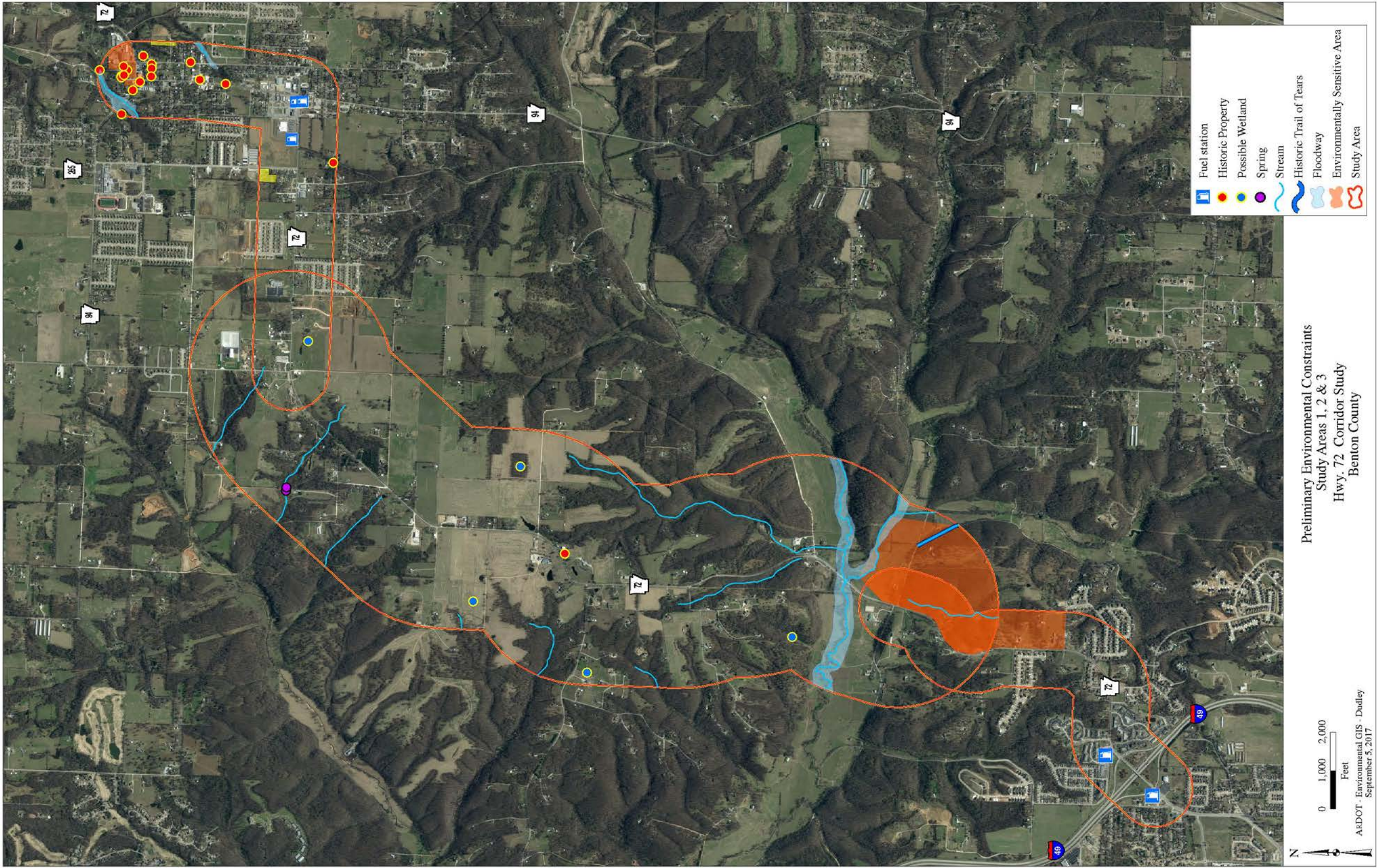
Installation of an ultra-thin bonded wearing course throughout the corridor is expected to reduce wet crashes, similar to the high-friction surface treatment installed near the Plentywood Road intersection. Access management strategies, such as encouraging shared access, would benefit safety by reducing vehicular conflicts.

ENVIRONMENTAL CONSIDERATIONS

A cursory environmental review was conducted to identify any environmental constraints or concerns that warrant consideration in the planning or design process. The cursory review identified the following constraints and concerns (Figure 4):

- Several streams, potential wetlands, and 100-year floodplains
- A cemetery
- Numerous historic properties and environmentally sensitive areas
- Several fuel stations

Figure 4 – Environmental Considerations



CONCLUSIONS

Highway 72 is the only direct route between Pea Ridge and Bentonville, serving as a critical link between the two Cities. Many Pea Ridge residents work in Bentonville, so traffic volumes are heavy westbound in the morning and eastbound in the afternoon. Job CA0902 alleviated much of the previous delay problems at the Interstate 49/Highway 72 Interchange, but traffic issues will increase in the future. Additionally, increasing traffic has led to more vehicular conflicts and diminishing safety performance. The Improvement Alternative was developed as a possible solution to the problems identified.

The Improvement Alternative will improve operations to target levels (LOS D or better) and enhance safety through the study period. To ensure that Highway 72 maintains its functionality, access management strategies should be strongly considered, particularly near Interstate 49 and central Pea Ridge where continued commercial development is likely to occur.

Due to limited funding available for many transportation needs statewide, Highway 72 would likely be widened incrementally as funding becomes available. Table 2 summarizes the recommended phasing and costs (2018 dollars) for improvements. Due to the high cost associated with widening, partnering with local jurisdictions should be explored if it is considered in the near future. At a minimum, possible removal of existing highways from the State Highway System should be considered.

Table 2 - Phasing of Improvements

Phase	Improvement	Location	Length (miles)	Construction Cost (millions)	Total Cost (millions) ¹
1	Various Short-Term Improvements	Various	-	\$3.4	\$3.7
2	Intersection Improvements	Highway 94 Intersections	-	\$2.0 ² (\$3.8 ³)	\$2.6 ² (\$5.1 ³)
3	Widen to four through lanes	Beau Terre Drive to Rocky Ridge Trail	1.83	\$8.6	\$11.4
4	Widen to four through lanes	Rocky Ridge Trail to It'll Do Road	3.57	\$20.2	\$26.0
5	Widen to four through lanes	It'll Do Road to Highway 94 South	1.37	\$8.4	\$11.1
¹ - Total cost includes preliminary engineering (PE), right-of-way (ROW), construction engineering (CE) and utilities with 30-percent contingencies. Actual costs may vary due to excavations. ² - Signal cost ³ - Roundabout cost					

APPENDIX A

MINUTE ORDER 2016-008

ARKANSAS STATE HIGHWAY COMMISSION

MINUTE ORDER

District: Nine
County: Benton
Category: Miscellaneous



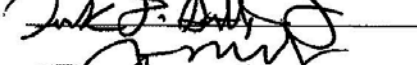
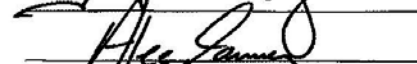

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WHEREAS, IN BENTON COUNTY, traffic volumes along the Highway 72 Corridor between Interstate 49 and the City of Pea Ridge continue to increase; and

WHEREAS, it has been determined that a study is required to identify the need for and feasibility of improvements.

NOW THEREFORE, the Director is authorized to conduct a study to determine the need for and feasibility of improvements to the Highway 72 Corridor between Interstate 49 and the City of Pea Ridge.

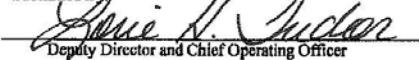
Approved:

 Chairman
 Vice-Chairman
 Member
 Member
 Member

DD-COO

Form 19-456
Rev. 6/18/2015

Submitted By:

 Deputy Director and Chief Operating Officer

Approved:

 Director

Minute Order No. **2016 008**

Date Passed **JAN 20 2016**



HIGHWAY 72 IMPROVEMENT STUDY

**INTERSTATE 49 IN BENTONVILLE TO PEA RIDGE
BENTON COUNTY**