



Highway 10 Improvement Study

Pulaski County



Executive Summary

July 2013

Highway 10 Improvement Study

Pulaski County Executive Summary

July 2013



Prepared by the Planning and Research Division
Arkansas State Highway and Transportation Department
In Cooperation with the Federal Highway Administration

This report was funded in part by the Federal Highway Administration, U.S. Department of Transportation. The views and opinions of the authors expressed herein do not necessarily state or reflect those of the U.S. Department of Transportation.

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT NOTICE OF NONDISCRIMINATION

The Arkansas State Highway and Transportation Department (Department) complies with all civil rights provisions of federal statutes and related authorities that prohibited discrimination in programs and activities receiving federal financial assistance. Therefore, the Department does not discriminate on the basis of race, sex, color, age, national origin, religion or disability, in the admission, access to and treatment in Department's programs and activities, as well as the Department's hiring or employment practices. Complaints of alleged discrimination and inquiries regarding the Department's nondiscrimination policies may be directed to Joanna P. Nelson, Section Head - EEO/DBE (ADA/504/Title VI Coordinator), P. O. Box 2261, Little Rock, AR 72203, (501) 569-2298, (Voice/TTY 711), or the following email address: joanna.nelson@arkansashighways.com.

This notice is available from the ADA/504/Title VI Coordinator in large print, on audiotape and in Braille.

AHTD:P&R:SP:AJW 7/3/2013

Introduction

Highway 10 is an east-west highway between Little Rock and western Arkansas and is a principal arterial within most of the Central Arkansas Regional Transportation Study Area (CARTS). This highway provides access to the northwestern portion of Little Rock and western Pulaski County. Because of increasing congestion along Highway 10 west of Interstate 430, the Arkansas State Highway Commission adopted Minute Order 2009-178, which authorized this study. This study identifies the scope of future improvements needed to relieve congestion along the Highway 10 corridor. It should be noted that a project has been scheduled to provide a new ramp from westbound Highway 10 to northbound Interstate 430. This study assumes the completion of this project.

Purpose and Need

Existing Conditions

Between Ferndale Cutoff Road and Highway 300, Highway 10 has two through lanes. Within this segment, there is also a two-way left-turn lane from west of Highway 300 to Chalamont Drive. Other than the three Robinson Schools located along Highway 10 within this segment, very little residential or commercial development currently exists to the west of Highway 300.

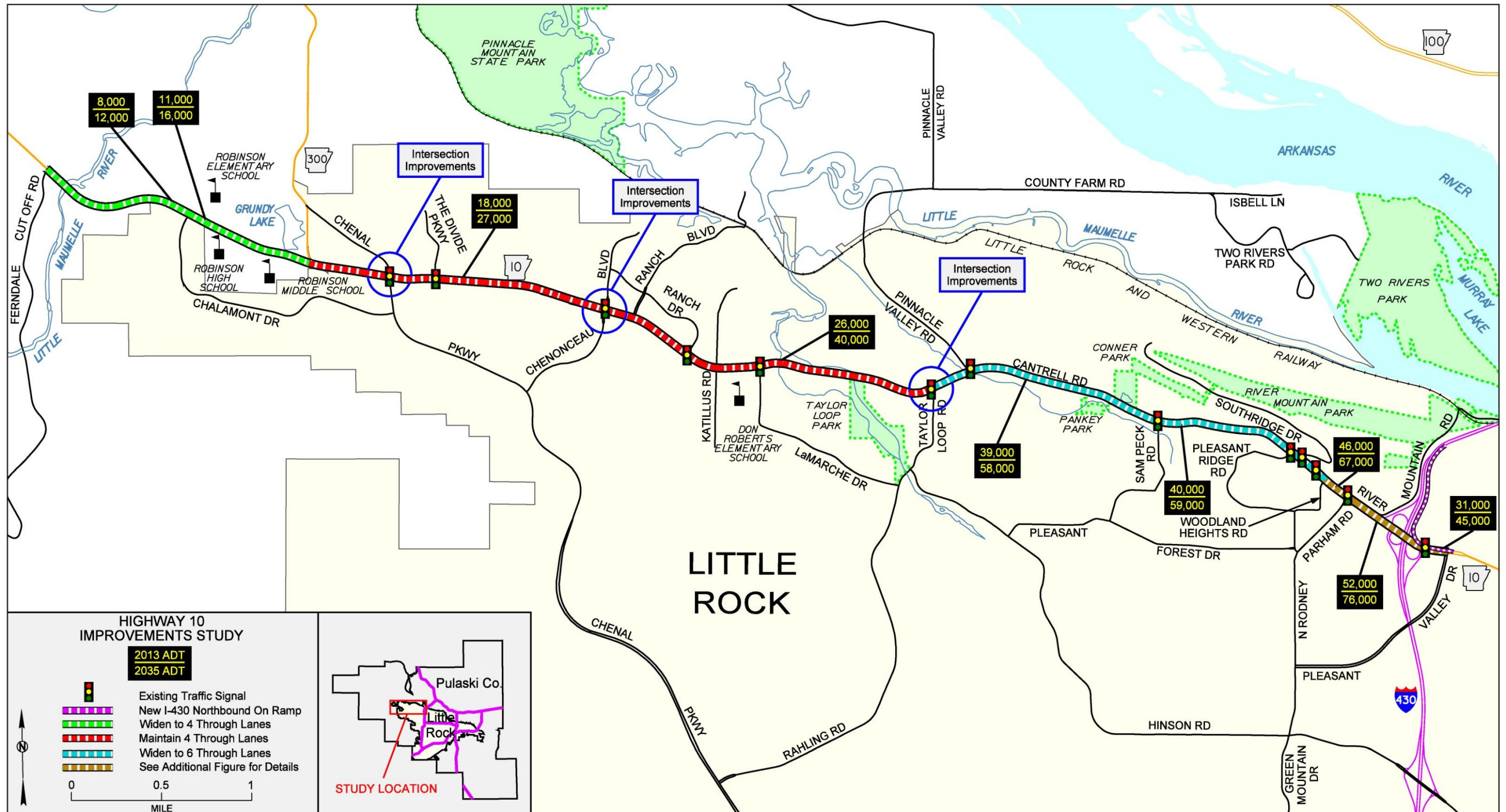
Between Highway 300 and Interstate 430, Highway 10 has four through lanes and a two-way left-turn lane. While some commercial and residential development has occurred between Highway 300 and Taylor Loop Road, a considerable amount of land exists for additional development. Highway 10 between Taylor Loop Road and Pleasant Valley Drive has a significant amount of development.

Traffic Analysis

Historical traffic data as well as the CARTS travel demand model were used to estimate future traffic volumes on Highway 10. Projected average daily traffic (ADT) ranges from 8,000 vehicles per day (vpd) to 52,000 vpd for 2013 and 12,000 vpd to 76,000 vpd for 2035 (Figure ES-1).

From Ferndale Cutoff Road to Highway 300, Highway 10 currently operates at an unacceptable level of service during the morning peak period. It is anticipated the afternoon peak period will also be at an unacceptable level of service by 2035. Between Highway 300 and Taylor Loop Road, forecasted traffic volumes are considered normal for an urban four-lane highway. East of Taylor Loop Road, Highway 10 has the highest traffic volumes of any arterial roadway in the State. Presently, peak hour traffic cannot be handled adequately at the Rodney Parham Road intersection, resulting in unacceptably long queues along Highway 10. The congestion at the Rodney Parham Road intersection also degrades the traffic operations at the adjacent intersections to the west. Motorists frequently have to wait through multiple traffic signal cycles during the peak periods. In addition, several Highway 10 signalized intersections between Taylor Loop Road and Pleasant Valley Drive are expected to operate at an unacceptable level by 2035, resulting in further congestion.

Figure ES-1 – Traffic Volumes and Proposed Improvements



Safety Analysis

A crash analysis was conducted for 2009, 2010 and 2011, the most recent three years for which crash data is available. A summary of the crash analysis is shown in Table ES-1. Of the total 14 fatal and serious injury (KA) crashes during the three-year period, two were fatal crashes. One of the two fatal crashes involved a bicyclist. Nine KA crashes were attributed to failure to yield or disregard of a traffic signal, four were due to careless or reckless driving and one was alcohol related. Eleven of the 14 KA crashes occurred at intersections.

Table ES-1 – Crash Rates

Segment	Route/Section/ Log Mile	Type of Roadway (Length)	Year	Weighted ADT	Number of Crashes	Crash Rate*	Statewide Average Crash Rate*	Number of KA Crashes
Ferndale Cutoff to West of Hwy. 300	Hwy. 10, Sec. 7, LM 16.13-16.26 Hwy. 10, Sec. 8, LM 0.00-1.35	Suburban Two-Lane Undivided ¹ (1.48 Miles)	2009	8,100	3	0.69	1.08/2.99 ¹	0
			2010	7,900	4	0.94	1.01/2.60 ¹	1
			2011	7,400	5	1.25	0.99/2.81 ¹	1
West of Hwy. 300 to Taylor Loop	Hwy. 10, Sec. 8, LM 1.35-5.08	Urban Four-Lane Undivided (3.73 Miles)	2009	19,100	33	1.27	4.80	1
			2010	19,800	40	1.48	4.63	2
			2011	18,800	59	2.31	4.43	0
Taylor Loop to Sam Peck	Hwy. 10, Sec. 8, LM 5.08-6.42	Urban Four-Lane Undivided (1.34 Miles)	2009	34,400	29	1.72	4.80	0
			2010	36,000	34	1.93	4.63	0
			2011	35,900	47	2.68	4.43	2
Sam Peck to Pleasant Valley	Hwy. 10, Sec. 8, LM 6.42-8.26	Urban Four-Lane Undivided ² (1.84 Miles)	2009	42,800	101	3.51	4.80	2
			2010	45,900	124	4.02	4.63	2
			2011	42,900	102	3.54	4.43	3
<p>* Crash rates are expressed in per million vehicle miles traveled (MVM).</p> <p>1. Analysis segment contains both urban and rural areas. Statewide Average Crash Rates are reported for both area types.</p> <p>2. Short portion east of Rodney Parham includes a raised median.</p>								

Discussion of Alternatives

Based on evaluation of the existing conditions, traffic and safety analysis, a no-action alternative (Alternative 1) and an improvement alternative (Alternative 2) were developed. Although routine maintenance would continue, Alternative 1 would not improve traffic flow or address expected congestion along Highway 10 within the study period. Alternative 2, as shown in Figure ES-1, identifies improvements that specifically address current and future congestion along the Highway 10 corridor, which includes the traffic flow challenges at the Rodney Parham Road intersection and the Interstate 430 interchange.

ALTERNATIVE 2

Ferndale Cutoff Road to Highway 300

Improvement to this segment of Highway 10 consists of widening the roadway from two through lanes to four through lanes and an appropriate median treatment. With the additional capacity, traffic on this segment of Highway 10 would operate at an acceptable level of service within the study period. The estimated construction cost is \$7.4 million.

Highway 300 to Taylor Loop Road

This four-lane segment is expected to operate at an acceptable level of service throughout the study period. To improve traffic flow, minor intersection improvements were identified at an estimated construction cost of \$300,000. Land use developments over the next 20 years could necessitate additional improvements. Therefore, this segment of Highway 10 should be monitored.

Taylor Loop Road to Woodland Heights Road

For this segment to operate at an acceptable level of service during the study period, widening from four through lanes to six through lanes and an appropriate

median treatment is recommended. Widening would extend to the west of Taylor Loop Road a short distance to ensure equal lane utilization through this intersection. The estimated construction cost is \$17.3 million.

Woodland Heights Road to Pleasant Valley Drive

Three improvement options were identified to address the recurring congestion within this segment of Highway 10. These options are discussed below and illustrated in Figures ES-2, ES-3 and ES-4.

- **Option A** would construct six through lanes on Highway 10 to Pleasant Valley Drive. It also includes a dedicated left-turn lane on River Mountain Road and dual right-turn lanes on northbound Rodney Parham Road. No additional intersection improvements or interchange modifications are proposed. Traffic operations would improve over the short term, but congested conditions would be expected to return well before 2035. The estimated construction cost is \$2.3 million.
- **Option B** would construct six through lanes on Highway 10 to Pleasant Valley Drive and provide a continuous flow intersection (CFI) at the Rodney Parham Road intersection. A dedicated left-turn lane would be provided on River Mountain Road. A separate ramp from the Interstate 430 southbound to Highway 10 westbound exit ramp would be provided for traffic accessing Rodney Parham Road. The CFI would allow the heavy westbound left-turn traffic at Rodney Parham Road to flow simultaneously with the eastbound through traffic. Therefore traffic operations would be improved to an acceptable level of service during much of the study period, but congested conditions would be expected to return before 2035. The estimated construction cost is \$6.4 million.

- **Option C** would provide eight through lanes on Highway 10 to Pleasant Valley Drive and a CFI at the Rodney Parham Road intersection. A dedicated left-turn lane would be provided on River Mountain Road. Several proposed modifications to the Interstate 430 interchange include:
 - Removal of the existing Interstate 430 southbound to Highway 10 eastbound loop ramp,
 - Addition of an Interstate 430 southbound to Highway 10 eastbound off ramp with a signalized intersection at Highway 10, and
 - Addition of a separate roadway for eastbound Highway 10 traffic accessing Interstate 430.

Option C is expected to alleviate congestion through the end of the study period. The estimated construction cost is \$14.6 million.

Figure ES-2 – Option A

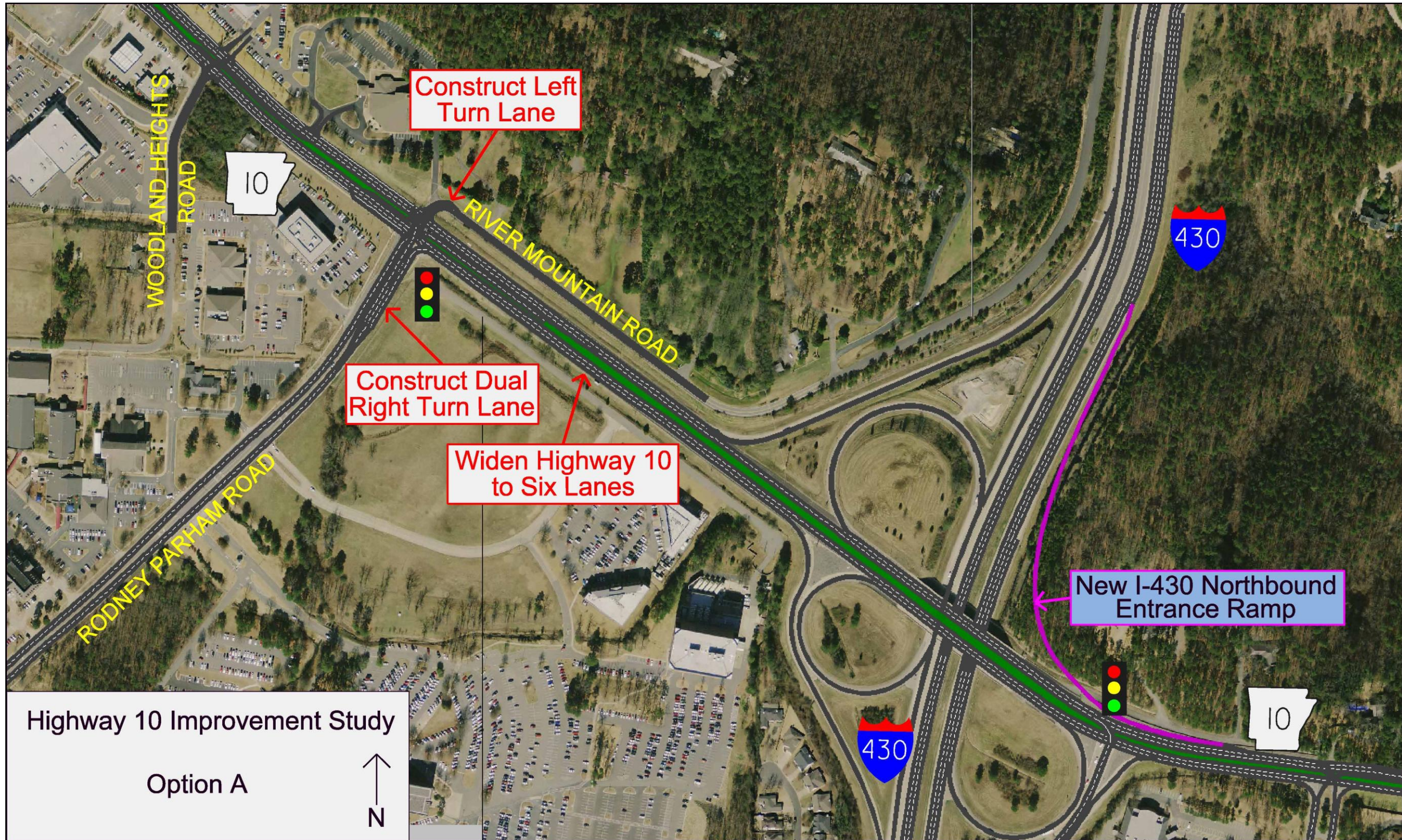


Figure ES-3 – Option B

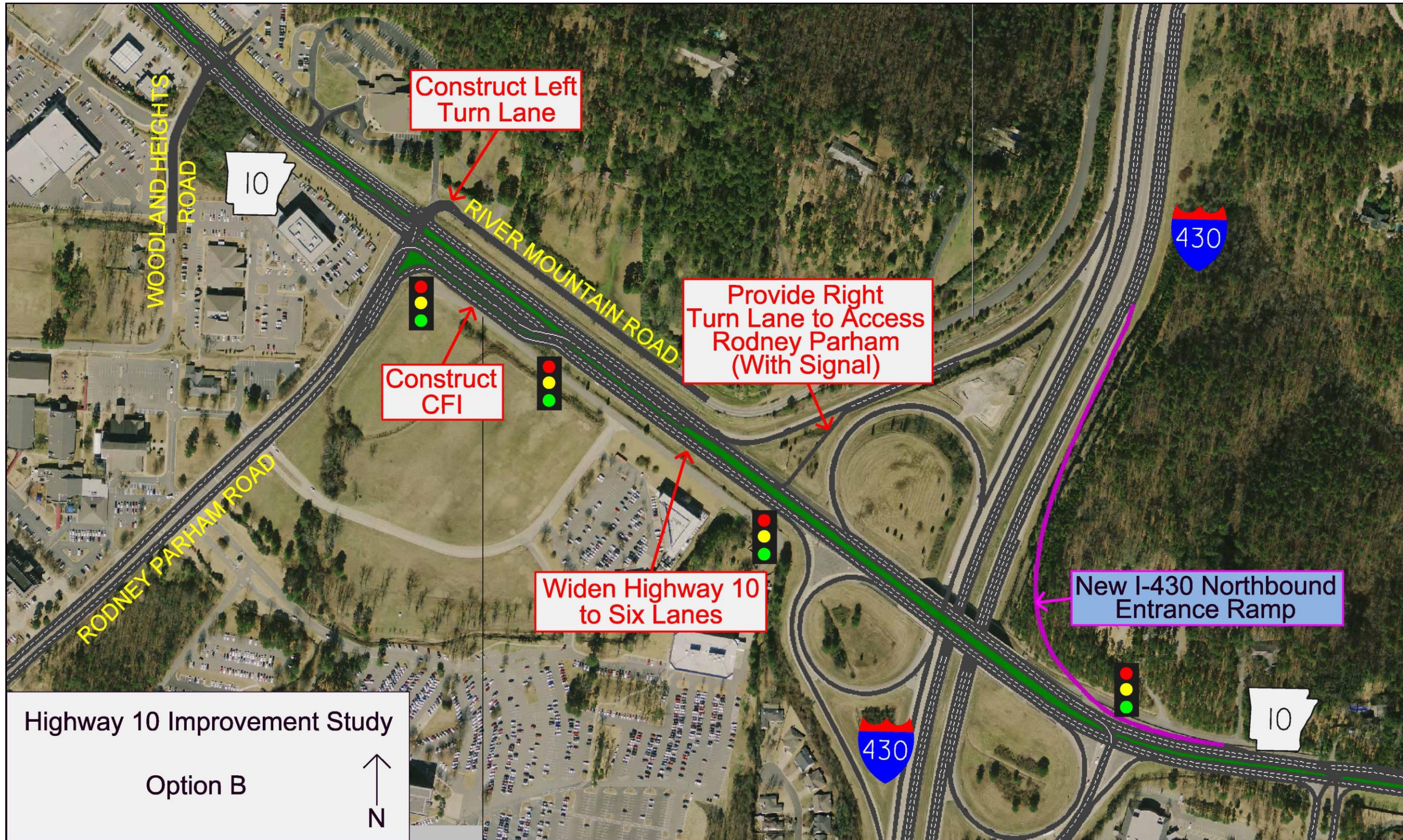
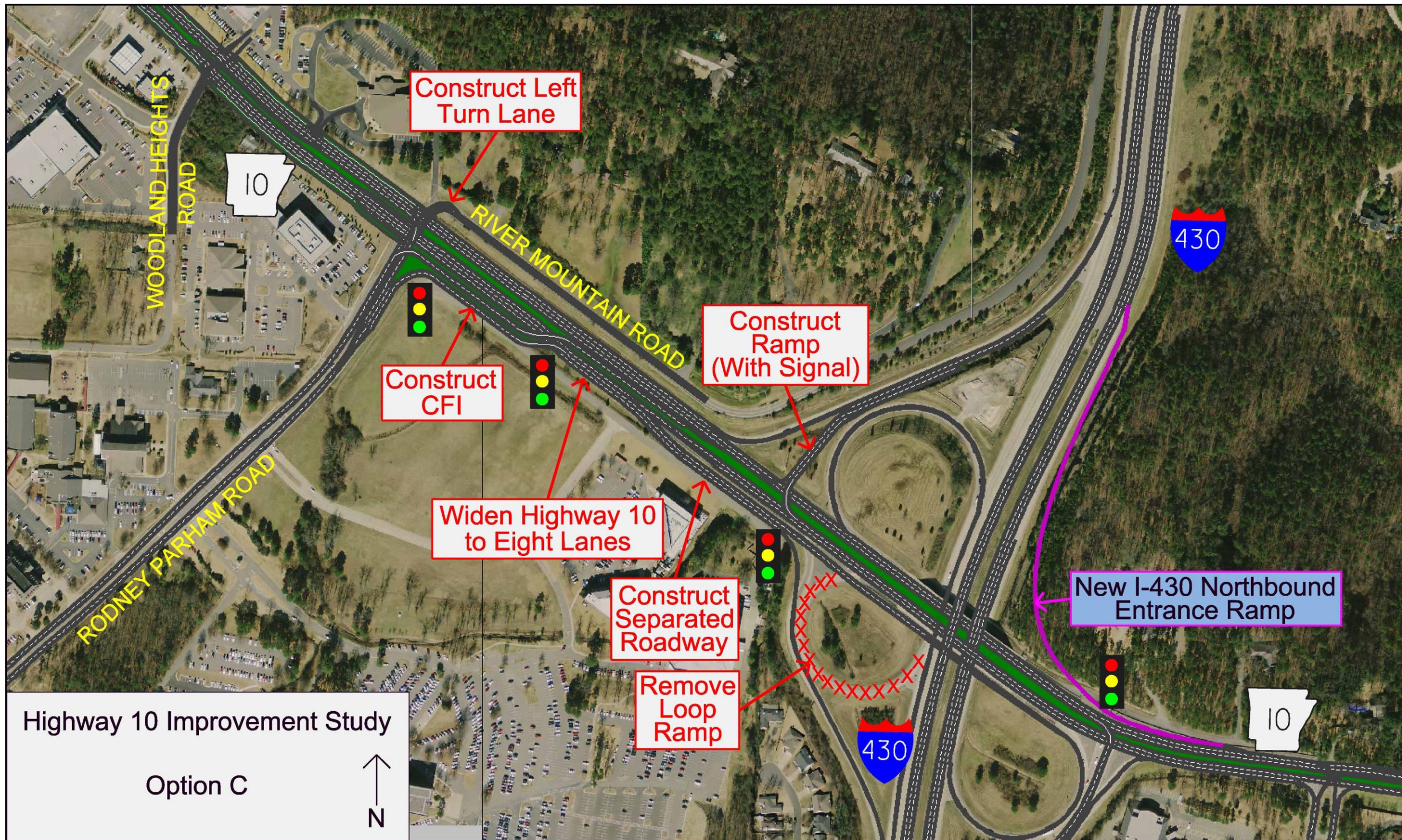


Figure ES-4 – Option C



Other Considerations

Median Treatment

The median treatments considered for Alternative 2 were a 16-foot raised median and a two-way left-turn lane.

1. The raised median would enhance the capacity of the corridor by reducing unpredictable turning conflicts, encouraging more orderly land use development, and providing a safe refuge for pedestrians crossing the highway. A median would also serve as an integral component of a comprehensive access management plan. The primary disadvantage of a raised median is that direct left-turn access into driveways would be limited.
2. A two-way left-turn lane would allow motorists to turn left into most driveways, but would increase unpredictable turning conflicts, slightly reduce the roadway capacity and require pedestrians crossing Highway 10 to walk up to 84 feet without a safe refuge.

Bicycle Accommodations

The adopted *AHTD Bicycle Facility Accommodation Policy* (Bicycle Policy) and *AHTD Sidewalk Policy* (Sidewalk Policy) are used to guide decisions on bicycle and pedestrian accommodations in the design of highway facilities. The City of Little Rock Master Street Plan identifies a shared-use path for bicycles and pedestrians along the Highway 10 corridor. According to the Department's Bicycle Policy, a 10-foot wide shared-use path may be constructed in lieu of separate bicycle lanes and sidewalks. If a shared-use path wider than 10-feet is desired, the additional costs for right-of-way and construction would be the responsibility of the local jurisdiction requesting the higher design standard.

Lane Use and Transportation

Other steps could be taken locally to enhance the transportation system, such as the development of a coordinated land use and transportation policy. An efficient local roadway network that provides an adequate system of minor arterial and connector streets between new developments would relieve traffic demands on the Highway 10 corridor. This would benefit the local population with options to avoid traffic congestion. An improved local roadway network would also provide options for bicyclists and pedestrians.

Metropolitan Transportation Plan

The adopted *METRO 2030.2 Metropolitan Transportation Plan (amended in August 2012)* by the Central Arkansas Metropolitan Planning Organization (Metroplan) identified capacity improvements for Highway 10 from Taylor Loop Road to Pleasant Valley Drive in the financially constrained plan and from Ferndale Cutoff Road to Highway 300 in the financially unconstrained plan.

Public Involvement

A public meeting was held on April 18, 2013 to solicit comments concerning the proposed improvements to the Highway 10 corridor. Of the comments received, an average of 79 percent agreed that the proposed widening, intersection and interchange improvements are needed. Eighty-eight percent of participants responded that the proposed improvements to the Highway 10 and Rodney Parham Road intersection and the Interstate 430 and Highway 10 interchange are appropriate.

In regard to the median treatments, 55 percent of participants preferred a raised median design and 45 percent preferred a two-way left-turn design. The City of Little Rock and Metroplan staff expressed a strong preference for a raised median along this route.

In regards to bicycle accommodations, 52 percent of participants preferred shared use paths; 28 percent preferred bicycle lanes; and 20 percent preferred no bicycle accommodations. Cyclists almost uniformly commented on the need for bicycle accommodations on Highway 10. Some non-cyclists expressed concern that bicycle usage is not appropriate along Highway 10 and that accommodations would simply encourage cycling activities. At the public officials meeting, some concern was raised about how pedestrians and bicyclists would be accommodated at the Rodney Parham Road intersection. Many cyclists in the area cross Highway 10 at the Rodney Parham Road intersection and then follow River Mountain Road to the Arkansas River Trail.

One option discussed by local officials was the construction of a grade separation for bicyclists and pedestrians over Highway 10 between Rodney Parham Road and Interstate 430. The additional right-of-way and construction costs for this option would be the responsibility of the local jurisdiction requesting the higher design standard.

Conclusion

This study was conducted to determine the need for and the feasibility of improvements to address traffic congestion along the Highway 10 corridor between Ferndale Cutoff Road and Pleasant Valley Drive. Based on the traffic and safety analysis and land use characteristics, four distinct segments were identified for improvements. The identified improvement options are summarized in Table ES-2.

Table ES-2 – Summary of Alternative 2

Segment		Improvements	Construction Cost (in 2013 dollars)	Total Cost ¹ (in 2013 dollars)
Ferndale Cutoff Road to Highway 300		Widen to Four Through Lanes	\$7,400,000	\$9,800,000
Highway 300 to Taylor Loop Road		Intersection Improvements	\$300,000	\$400,000
Taylor Loop Road to Woodland Heights Road		Widen to Six Through Lanes	\$17,300,000 ²	\$23,300,000
Woodland Heights Road to Pleasant Valley Drive	Option A	Widen to Six Through Lanes	\$2,300,000	\$3,200,000
	Option B	Widen to Six Through Lanes and CFI	\$6,400,000	\$8,700,000
	Option C	Widen to Eight Through Lanes, CFI and Interchange Improvements	\$14,600,000	\$18,900,000
All Segments with Option A			\$26,900,000	\$36,000,000
All Segments with Option B			\$31,400,000	\$42,200,000
All Segments with Option C			\$39,600,000	\$52,400,000
Note: ¹ Total Cost includes construction, right-of-way acquisition, utility relocation, and preliminary and construction engineering. ² Includes interim Taylor Loop intersection improvements at a construction cost of \$1,000,000				

From Ferndale Cutoff Road to Woodland Heights Road, capacity and intersection improvements would provide acceptable traffic operating conditions through 2035. From Woodland Heights Road to Pleasant Valley Drive, Options A and B would provide some congestion relief. However, only Option C would address congestion and provide capacity needs through 2035. Special issues such as median treatment options and bicycle and pedestrian accommodations will be addressed during the environmental phase of project development.

Recommended Phasing of Projects

The first priority, which would utilize the available funding to date, is shown in Figure ES-5 and would include widening Highway 10 to six through lanes from just west of Pleasant Ridge Road to Woodland Heights Road and widening to eight through lanes from Woodland Heights Road to Pleasant Valley Drive, constructing a CFI at the Highway 10 and Rodney Parham Road intersection, and providing additional modifications to the Interstate 430 and Highway 10 interchange. The next priority is interim improvements to the intersection of Highway 10 and Taylor Loop Road. These interim improvements include the addition of a second westbound left-turn lane and a second northbound right-turn lane and are estimated to cost \$1 million (in 2013 dollars). The third priority is the widening of Highway 10 to six through lanes from just west of Taylor Loop Road to just west of Pleasant Ridge Road.

Improvements west of Highway 300 should be considered as the final priority for this corridor.

Figure ES-5 – Initial Improvements

