FY 2011 Continuing Appropriations Act

TIGER Discretionary Grant Program

Highway 150 Resurfacing Project

Project Type: Highway

Project Location: Mississippi County (1st District)

Area Type: Rural

Grant Amount Requested: $1.76 million

Submitted by

Arkansas State Highway and Transportation Department
October 31, 2011

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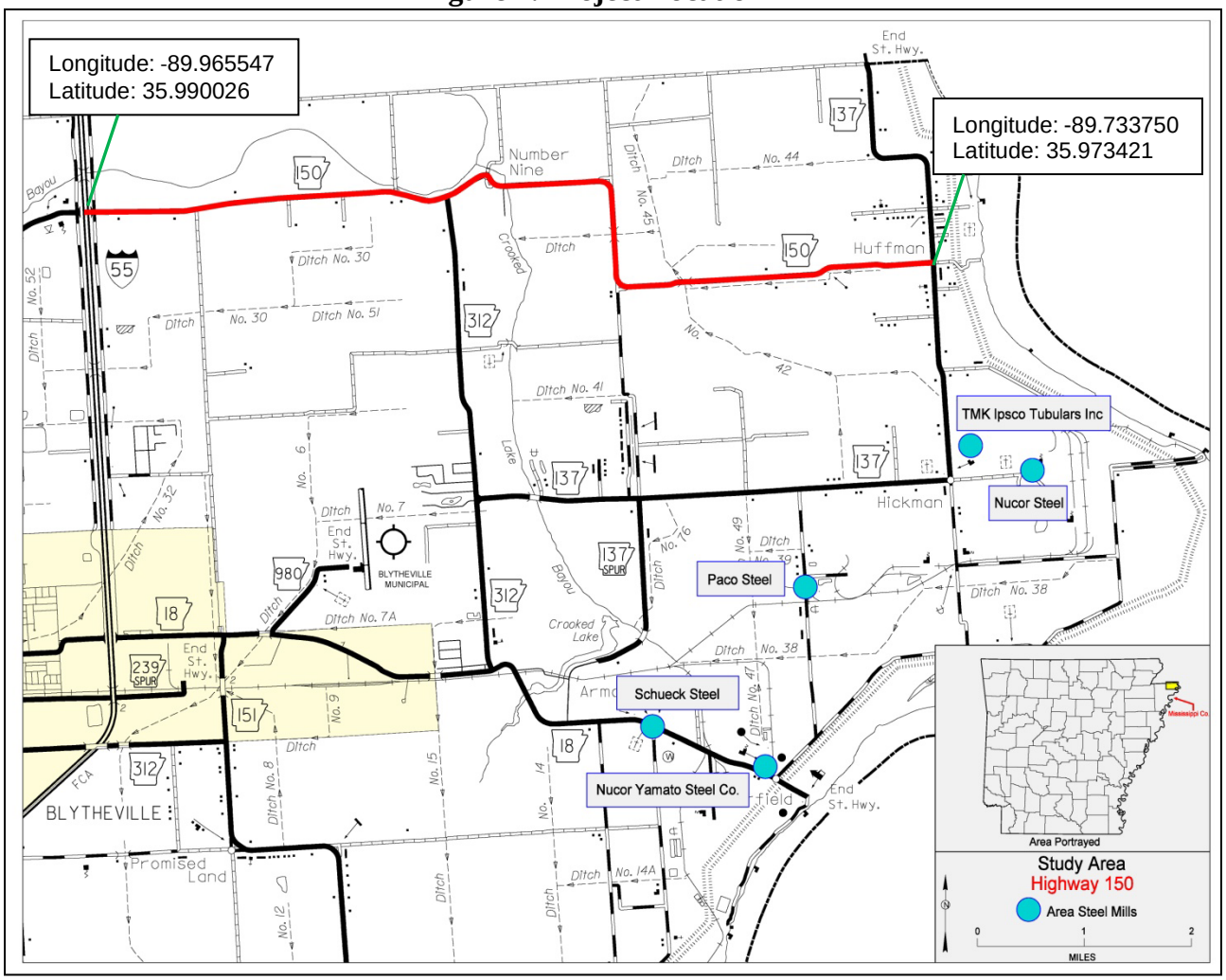
I. Project Description

The Arkansas Highway and Transportation Department (Department) requests $1.76 million to improve an 8.9 mile segment of Highway 150 between Interstate 55 and the Mississippi River. Highway 150, an important industrial link, is functionally classified as a major rural collector located between Interstate 55 and major employers in the region. The 8.9-mile segment begins at the Interstate 55 Interchange and ends at its intersection with Highway 137. This route is the main access from Interstate 55 to three major steel mills, their secondary industries, and the agriculture industry located in Huffman, Mississippi County, Arkansas. These industries support nearly 3,000 direct employment jobs. Highway 150 parallels Highway 18 to the north. Highway 18 is functionally classified as an other principal arterial and has experienced commercial development through Blytheville and to the east.

Figure 1: Project Location



This project will provide a two-inch overlay and minor widening with restriping and Safety Edges to provide a safe and reliable route to the steel and the agricultural industries in the area. The total estimated construction cost is $2.2 million. This application requests $1.76 million (80% of the project cost) in federal assistance. The Department will provide the matching funds. This project is not suitable for the TIFIA program because the total cost is less than $50 million.

Figure 2 displays the project location, area industries, current and projected traffic volumes and truck percentages, and the Level of Service. Truck volume is known to be highly variable, depending on agricultural activity. The truck percentages shown are average truck percentages.

The current route has 10-foot lanes with narrow or unpaved shoulders and a posted speed of 55 miles per hour (mph). The existing facility has a pavement condition index (PCI) of 68 with an International Roughness Index (IRI) value of 127 inches per mile (in/mi). As shown in Figure 3, the subject segment is in a much deteriorated state and has been receiving frequent maintenance activities (patching and sealing) over the last three years. Improving the surface of this route will improve the ride quality, thus lowering operating and maintenance costs for both passenger vehicles and commercial vehicles. This application can be found at http://www.ahtd.ar.gov/TIGER/III/Hwy150_Appication.

Figure 2: Traffic Volumes and Truck Counts

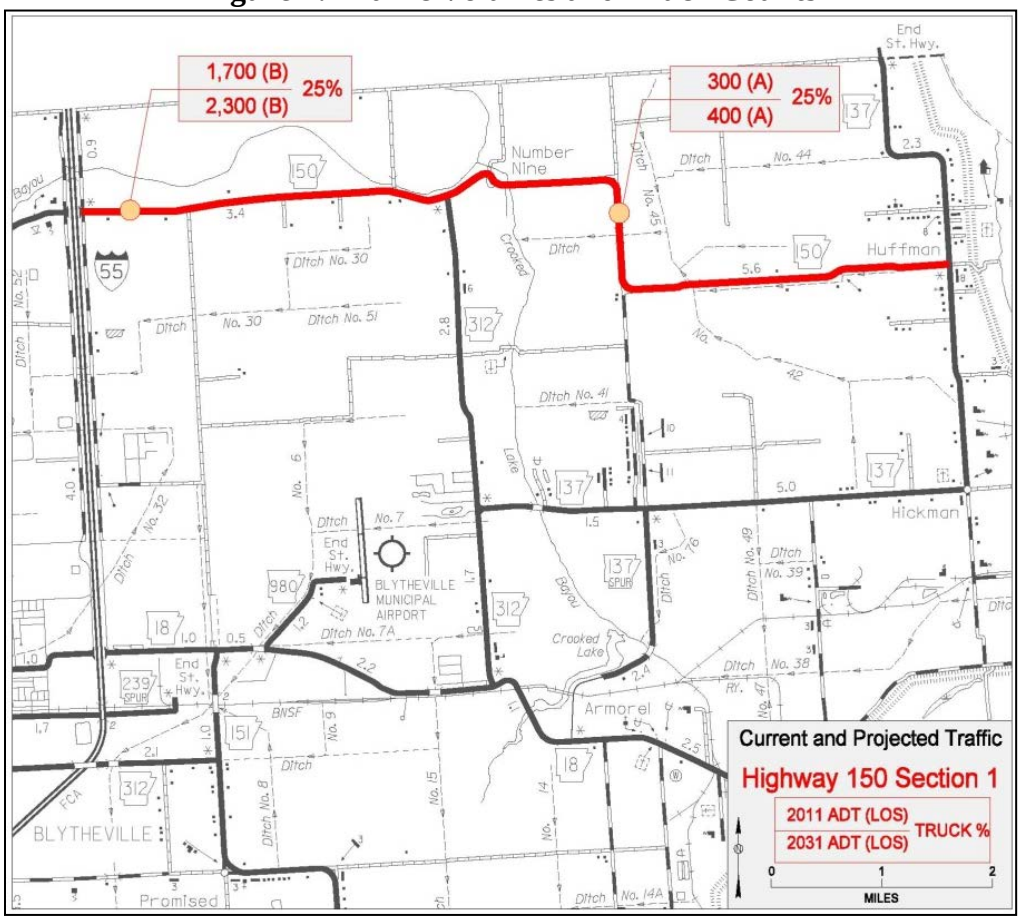


Figure 3: Cracking and Minor Rehabilitation

II. Project Parties

In 1913 the 39th Arkansas General Assembly appointed the first State Highway Commission, under Act 302, to address the transportation needs of the state. Amendment 42 of the Constitution of Arkansas, passed by a vote of the people in November 1952, established the present five-member State Highway Commission that is appointed by the Governor. Under Amendment 42, the State Highway Commission was vested with the power of administering Arkansas' State Highway System. In 1977, Act 192 created the Arkansas State Highway and Transportation Department by adding the responsibility for coordination public and private transportation activities and the implementation of a safe and efficient intermodal transportation system.

The Arkansas State Highway and Transportation Department is the sole applicant for this project. The primary point of contact is:

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III. Grant Funds and Sources/Use of Project Funds

The Department requests $1.76 million in Federal funds for the construction of the proposed improvements. The total cost of the project is $2.2 million. The grant request amount represents 80% of the total project cost. The remainder of the project cost, $440,000, will be funded using state construction funds. This project is not suitable for TIFIA funding because the total cost is less than $50 million. Table 1 displays the anticipated use of project funds. Limited preliminary engineering costs are anticipated. All improvements are expected within the existing right of way.

Table 1 – Use of Project Funds

Task	Funds Previously Expended	Funds Requested (Federal)	State Match	Project Total
Maintenance (2007-2009)	$81,281	—	—	—
Preliminary Engineering	—	0	0	0
Right of Way Acquisition	—	0	0	0
Construction	—	$1,760,000	$440,000	$2,200,000
TOTAL	$81,281	$1,760,000	$440,000	$2,200,000

IV. Selection Criteria

a. Long Term Outcomes

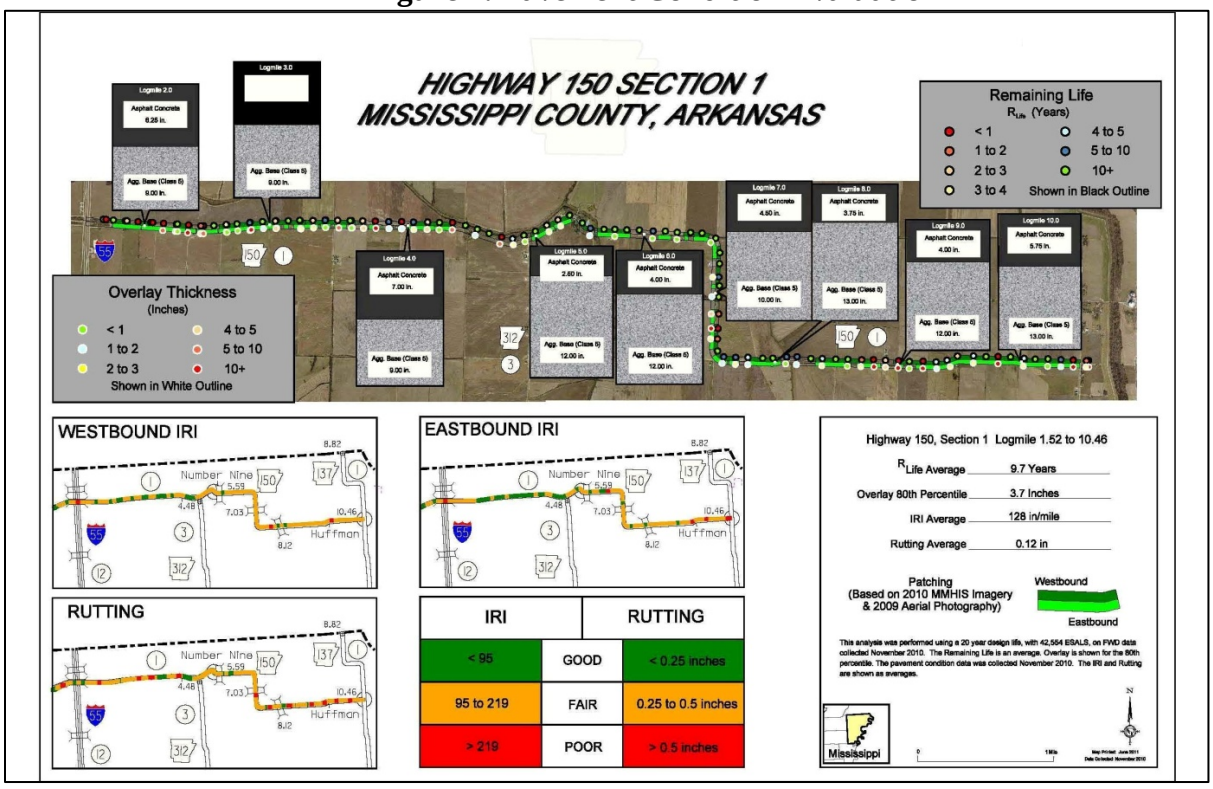
i. State of Good Repair

A planning study for this section of Highway 150 was completed by the Department in early 2011. The study shows, as with most low volume highways, that roadway conditions are highly variable. A visual review of the route verifies this finding. The field survey conducted in November 2010 found approximately 60% of this route had identifiable areas of minor rehabilitation (seal, patch, or thin overlay). There were also segments that exhibited longitudinal and block cracking.

A Falling Weight Deflectometer (FWD) analysis was conducted in November 2010 to investigate the structural quality of the pavement along the study segment. The analysis determined that most of the pavement on this segment has an average remaining life of over nine years. In order to extend the pavement life to 20 years, an asphalt overlay of approximately 3.5 inches on the existing pavement is required. A closer inspection of the FWD analysis shows that the pavement is weaker with significant rutting from Log Mile 8.4 to Log Mile 10.46 as shown in Figure 4. Figure 4 [www.ahtd.ar.gov/TIGER/III/150/pavement_conditions] also displays selected sections that show that the rut depth significantly exceeds 0.25 inches in depth.

The average International Roughness Index (IRI) for the segment is 128 inches per mile (in/mi), which is considered fair. The average rut depth of this segment is 0.12 inches, which is considered good. There is an increase in the IRI and rutting within the last two miles of the segment (Log Mile 8.4 – Log Mile 10.4) where average IRI increases to 157 in/mi and the average rut depth increases to 0.14 inch.

Figure 4: Pavement Condition Evaluation



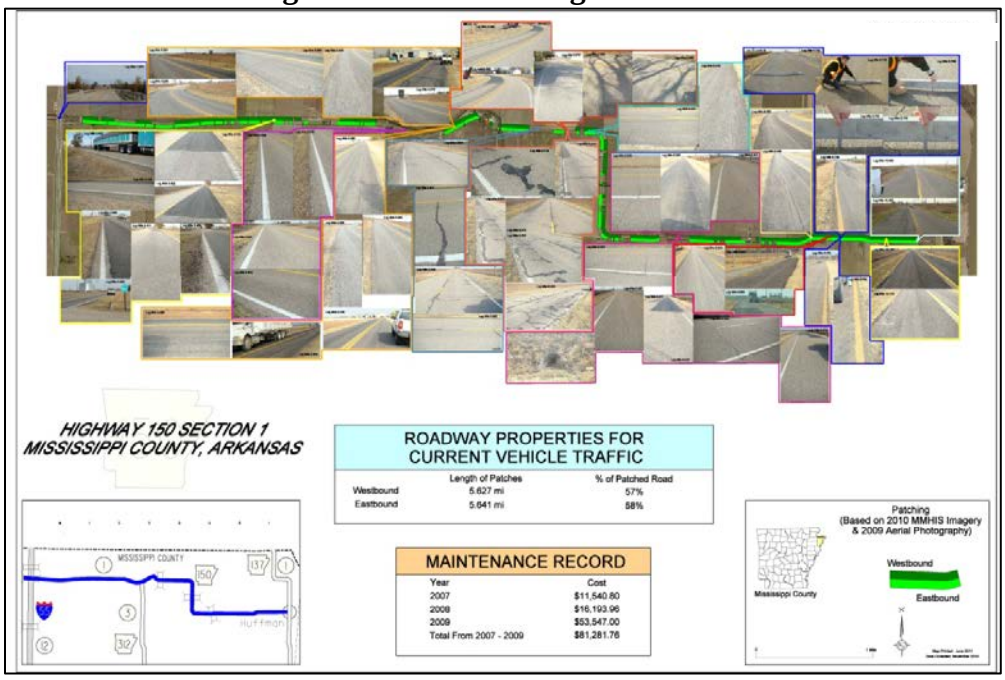
The following image shows rutting in the outside the wheel path near the eastern end of the project segment.

Figure 5: Typical Rutting Found Between Log Mile 8.4-10.46

In addition to identified areas with surface and rutting problems, there are also locations along the route that exhibit evidence of deterioration at the edge of the pavement. The width of the unpaved shoulder along of this segment is approximately four feet. In these situations, vehicles may tend to drift to the center of the roadway to avoid drop off problems. This leads to increased potential for crashes across the centerline. Further, roadway departure crashes have been identified with the lack of a shoulder or with a shoulder drop off. In some situations, if a tire of a moving vehicle falls off the roadway while traveling; the driver may over correct

causing the vehicle to cross the centerline of the roadway. Additional discussions regarding to safety benefits are included in *v. Safety*. Figure 6, shown here [www.ahtd.at.gov/TIGER/III/Hwy150/pavementedge_conditions] identifies areas along the route with noticeable pavement edge deterioration.

Figure 6: Pavement Edge Conditions



ii. Economic Competitiveness

The resurfacing and minor widening of Highway 150 will help to ensure the economic vitality of the steel mills, the associated secondary industries and the agricultural industry by providing smoother and safer travel to the industries and communities located along this route. With an improved Highway 150, the steel mills are able to receive more dependable shipments of raw materials for production. Likewise, the shipping of finished products from this area to Interstate 55 and points beyond will be enhanced with an improved facility.

An improved highway will also provide a more dependable route for employees to reach their places of work thus helping make the workforce generally more reliable. A more reliable workforce and dependable access to and from the facilities along the route will improve and help maintain the efficiency and competitiveness of this area.

Finally, this project will also assist agricultural-based employers and self-employed members of the agricultural sector in the area by ensuring the agricultural industry maintains the ability to provide the many services that are offered to move agricultural products to market. These activities include moving agricultural products to the cotton gin and grain elevator as well as moving products out to other locations to be shipped nationwide.

iii. Livability

This project will improve the livability of this region and will enhance the regional network. Improvements to this route will allow better access to the steel mills and agricultural

area. This will allow vehicles to avoid traveling along Highway 18 and avoid mixing with local traffic. This will help reduce congestion along Highway 18, therefore providing improved travel along Highway 18.

Mississippi County currently has an unemployment rate of 11.5 percent, above the national unemployment rate of 9.5 percent. Mississippi County has a per capita income of $29,051 which is well below the national average of $39,635. The high unemployment rate and low per capita income are shaded in Table 2.

Table 2 – Unemployment Rates and Per Capita Incomes (as of August 2011)

County	Per Capita Income	Unemployment
Mississippi	$29,051	11.5%
Arkansas Avg.	$32,315	7.8%
United States Avg.	$39,635	9.5%

Note: Shading indicates Median Income values less than the national average and Unemployment values greater than the national average.
Source: 42 USC 38 Subchapter III, Section 3161 and Arkansas Department of Workforce Services

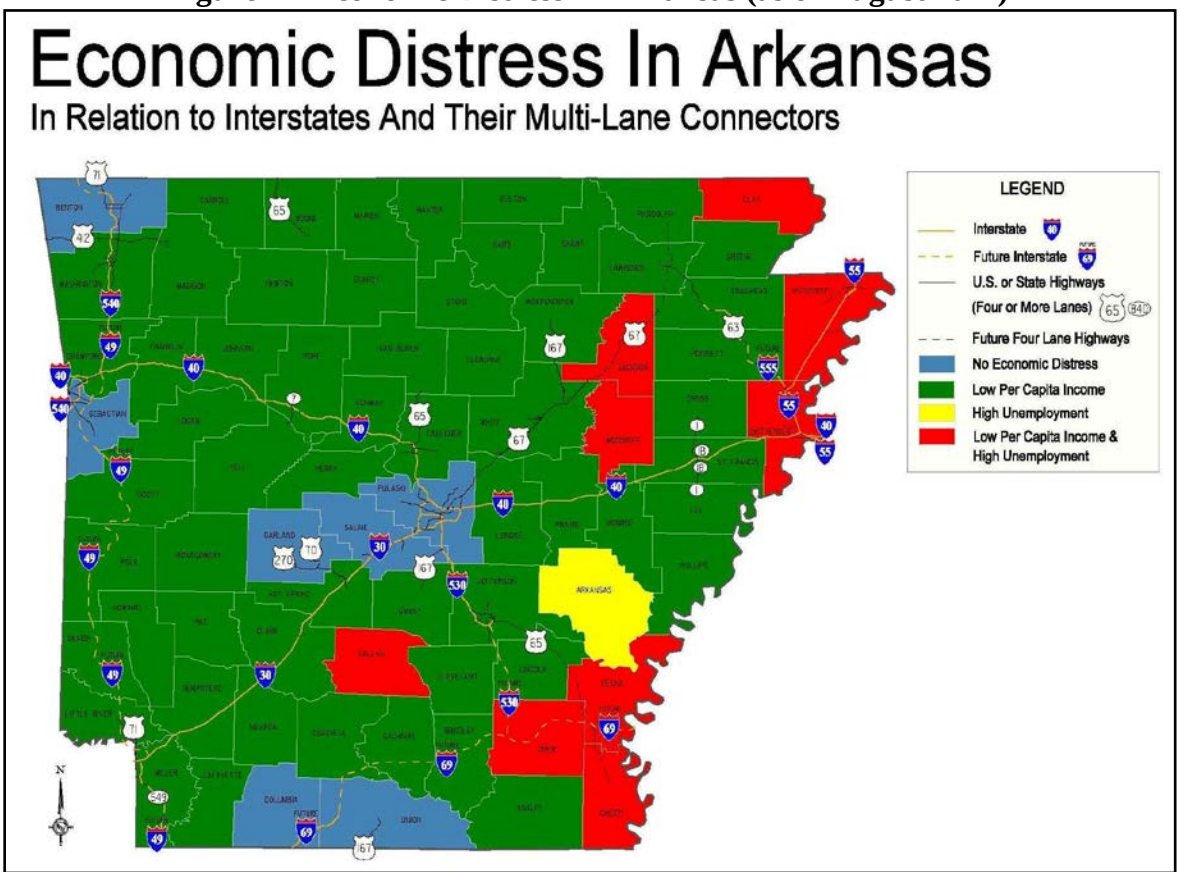
As specified in U.S. Code Title 42, Chapter 38, Subchapter III, Section 3161, a county is defined to be in economic distress if the median per capita income is less than 80 percent of the national average or the unemployment rate is greater than one percentage point above the national average. Mississippi County currently meets both economic distress categories; therefore it is considered an economically distressed county. Any improvements to the transportation system in Mississippi County will accomplish the stated goals of the TIGER Grant Program.

iv. Sustainability

Unlike other regions of the United States, Arkansas' climate allows farmers to enjoy a longer growing season. After harvest, agricultural products must be transported to the markets to be sold. Arkansas is fortunate in its strategic location at the cross-roads of highway, rail, and waterways systems. As stated above, improved connectivity to the regional transportation system will help reduce transportation costs for both products being shipped into and out of this area.

The steel and agricultural industries have been viable in this region for some time and they are expected to remain viable for the foreseeable future. Access for commercial vehicles along Highway 150 will continue to support the industries located on this route for the movement of goods to the steel and agricultural industries.

Figure 7 – Economic Distress in Arkansas (as of August 2011)



v. Safety

The crash data for Highway 150 was analyzed with the most current three years of available data (2007-2009). The crash rates are based on the number of crashes per million vehicle miles (MVM) traveled. Crash rates were found to be higher than the statewide averages for similar facilities during all three years, as shown in Table 3.

Table 3 – Crash Rates

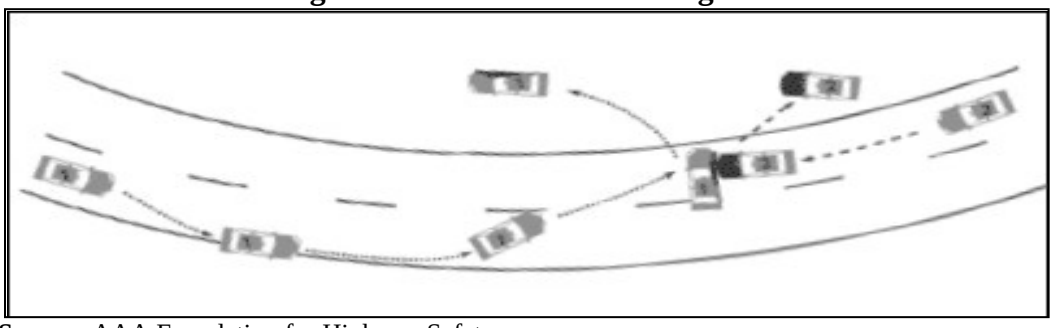
Year	Number of Crashes	Crash Rate	Statewide Average Crash Rate*
2007	11	2.77	1.15
2008	5	1.76	1.12
2009	5	2.10	0.81

*Rural, two-lane, two-way undivided, no control of access highways.

Ninety percent of the crashes on this route were single vehicle crashes. A large number of the single vehicle crashes were identified as roadway departure crashes. In addition, pavement deterioration is a safety concern since heavy trucks and other vehicles may be forced to travel closer to the centerline to avoid shoulder deterioration. Further review of the crash data also verified that some of the crashes occurred along this facility include opposite direction sideswipe between two tractor trailers. Furthermore, when a vehicle does drive off the side of

the road, there is an opportunity for the driver to "over correct" increasing the possibility of multiple vehicle crashes as shown in Figure 8.

Figure 9: Over Correction Diagram



Source: AAA Foundation for Highway Safety

In response to the safety concerns, the planning study recommended the installation of Safety Edges and high reflective striping. These measures will enhance the safety along this route by better delineating the lane and edge of pavement markings as well as providing transition between the pavement and the graded material.

As part of the Federal Highway Administration (FHWA) "Every Day Counts" initiative, Safety Edges are used to prevent crashes caused by pavement edge drop-offs on highways. These crashes normally occur on a two-lane road with height differences of the graded materials. The normal paving techniques result in vertical edges. Adding a 30-degree tapered edge to the pavement edge will provide a safer roadway edge and a stronger interface between the pavement and the graded material. Recent research has shown that almost all drivers and vehicles can recover if the edge is tapered to 30 degrees from the horizontal; therefore protect motorists from run-off-the-road crashes.

The proposed improvement, which includes resurfacing and minor widening, with the use of the Safety Edge is expected to improve safety by reducing both the number of sideswipe crashes and run-off-the-roadway crashes that occur.

b. Job Creation and Near Term Economic Activity

Based on the total anticipated cost of this project and employment benefits quantified by the FHWA and the American Association of State Highway and Transportation Officials (AASHTO), there will be 62 jobs supported over the duration of the project. The ability to support employment through this project is shown in Table 4. This project is considered "shovel ready" and can be let to contract quickly after funding is received.

Table 4 – Jobs Supported by TIGER III Investment

Quarter/Calendar Year	Construction Jobs	Supporting Industry Jobs	Non-Construction Jobs	TOTAL Employment
2012 Q3	3	1	5	9
2012 Q4	3	1	5	9
2013 Q1	4	2	5	11
2013 Q2	4	2	5	11
2013 Q3	4	2	5	11
2013 Q4	4	2	5	11
PROJECT TOTAL	**22**	**10**	**30**	**62**

c. Innovation

Safety edges are used to protect motorist from run-off-the-road crashes, which normally occur on two-lane roads with unpaved shoulders. Adding a 30-degree tapered edge to the pavement edge will provide a safer roadway edge and a stronger interface between the pavement and the graded material.

d. Partnership

Highway 150 is located in rural Mississippi County. The Department is the sole applicant for the resurfacing and minor widening project.

e. Results of Benefit-Cost Analysis

The Benefit Cost Analysis (BCA) [www.ahtd.ar.gov/TIGER/III/150/BCA]was performed in accordance with the American Recovery and Reinvestment Act (ARRA) guidance provided in the Federal Register. These benefits and costs were quantified in accordance with the Federal Register Volume 75, Number 104, Docket No. DOT-OST-2010-0076 and Circulars A-4 and A-94 (See http://www.whitehouse.gov/omb/circulars/).

The purpose of the BCA is to systematically compare the benefits and costs of improving Highway 150 between Interstate 55 and Highway 137 in Mississippi County, Arkansas. The BCA compared the cost of resurfacing this facility versus the cost of not doing anything outside of routine maintenance. The analysis considers a 20-year project life (2012 through 2032) for purposes of the BCA.

The analysis considered standard features of roadway construction and maintenance costs in Arkansas. Road User Benefits that were considered include the value of travel time savings provided by the improved facility, vehicle operating cost benefits, and the value to society of enhancing the safety within the improved highway network.

Many benefits of this project do not easily lend themselves to simple quantification. The economic benefits of connecting employees to places of employment and of improving access to industrial and agricultural sites for both inbound and outbound shipment of raw materials, farm products, and finished goods as well as providing a safe and efficient transportation network for the region cannot be easily quantified beyond the impacts of construction activities and travel time savings. Providing an improved transportation network in the region does make a positive

impact in terms of improving Mississippi County's unemployment rate and per capita income which is a goal of the TIGER Discretionary Grant program.

The construction cost estimate to improve Highway 150 is $2.2 million. This cost reflects basic construction methods and schedules. A 3% inflation rate was applied to calculate future costs and benefits. Additionally, a 3% discount rate was used to bring future benefits and costs to present value.

The proposed improvements on Highway 150 between Interstate 55 and Highway 137 would provide a net positive economic impact of 2.04. The summary table from the Benefit Cost Analysis is shown on Table 5.

V. Project Readiness and NEPA

Because the proposed improvements are within the Department's right of way, a Tier I Categorical Exclusion is expected without any significant environmental issues. Pending full funding of this application, FHWA approval to begin construction can be obtained within six months.

VI. Federal and Wage Rate Certification

The Federal Wage Rate Certification statement is included in Appendix B [www.ahtd.ar.gov/TIGER/III/150/Davis_Bacon].

VII. Corrections to the Pre-Application

The project name has been changed to Highway 150 Resurfacing Project.

Table 5: Benefit Cost Analysis Results

Year	Activity	Construction and Maintenance Costs		Value of Time Saved Benefit		Vehicle Operation Cost Benefit		Safety Benefits	
		Non-Disc.	Discounted	Non-Disc.	Discounted	Non-Disc.	Discounted	Non-Disc.	Discounted
2013	(Construction)	$2,195,550	$2,195,550		$0		$0		$0
2014		$0	$0	$112,673	$109,391	$12,567	$12,200	$74,481	$72,312
2015		$0	$0	$117,480	$110,736	$13,174	$12,418	$78,095	$73,612
2016		$0	$0	$122,827	$112,404	$13,736	$12,571	$81,438	$74,527
2017		$0	$0	$128,417	$114,097	$14,362	$12,760	$85,156	$75,660
2018		$0	$0	$134,630	$116,133	$15,015	$12,952	$89,044	$76,810
2019		$0	$0	$140,373	$117,560	$15,742	$13,183	$93,364	$78,191
2020		$0	$0	$146,762	$119,331	$16,413	$13,346	$97,360	$79,163
2021		$0	$0	$153,442	$121,129	$17,160	$13,547	$101,805	$80,366
2022		$0	$0	$160,866	$123,290	$17,941	$13,751	$106,453	$81,587
2023		$0	$0	$167,728	$124,805	$18,809	$13,996	$111,618	$83,054
2024		$0	$0	$175,362	$126,685	$19,612	$14,168	$116,395	$84,086
2025		$0	$0	$183,344	$128,594	$20,504	$14,381	$121,709	$85,364
2026		$0	$0	$192,214	$130,889	$21,438	$14,598	$127,266	$86,662
2027		$0	$0	$200,414	$132,497	$22,475	$14,859	$133,441	$88,220
2028		$0	$0	$209,536	$134,493	$23,434	$15,041	$139,152	$89,317
2029		$0	$0	$219,073	$136,519	$24,500	$15,268	$145,505	$90,674
2030		$0	$0	$229,672	$138,955	$25,615	$15,498	$152,149	$92,052
2031		$0	$0	$239,470	$140,663	$26,855	$15,774	$159,531	$93,708
2032		$0	$0	$250,370	$142,782	$28,000	$15,968	$166,359	$94,872
2033		$0	$0	$261,766	$144,933	$29,275	$16,209	$173,954	$96,314
TOTAL			$2,195,550		$2,525,889		$282,488		$1,676,552
			$4,484,929	Discounted Benefit					
			$2,195,550	Discounted Costs					
			2.04	Overall B/C					