



Economic Analysis of Completing ADHS Corridor V in Mississippi

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Prepared for:
Appalachian Regional Commission



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Introduction

The Appalachian Regional Commission (ARC) supported Mississippi DOT's development of an INFRA grant application for an 8.1-mile long connector on State Route 76¹. ARC's intention was to consider the segment's construction as the completion of the Appalachian Development Highway System's corridor V and to highlight the increased economic development opportunities along the corridor.

This memo documents the Benefit Cost Analysis (BCA) results from the grant application and includes the narrative about expectations of economic development perspectives of the corridor V completion, which were gained from interviews with economic development agencies, business associations and individual businesses. It demonstrates how large-scale economic perspectives can be included in a federal grant application.

EDR Group was commissioned by ARC particularly to determine the added value of project benefits for freight shipments along the corridor. EDR Group used vfreight data and economic models to estimate the savings in freight logistics costs to businesses shipping goods along corridor V. The value of on-time delivery and shorter shipment times are not of the same importance of for every commodity. This requires analyzing the commodity mix shipped on trucks through the corridor. Different dollar values can then be assigned to different commodities.

This approach led to an additional benefit for the SR76 project that was entirely free of overlaps with traditionally captured benefits like travel time savings or vehicle operation cost. It increased the total benefits displayed in Mississippi's INFRA grant application and helped lift the project beyond the threshold of a benefit-cost ratio of 1.5, which is applied by USDOT when evaluating the economic feasibility of projects.

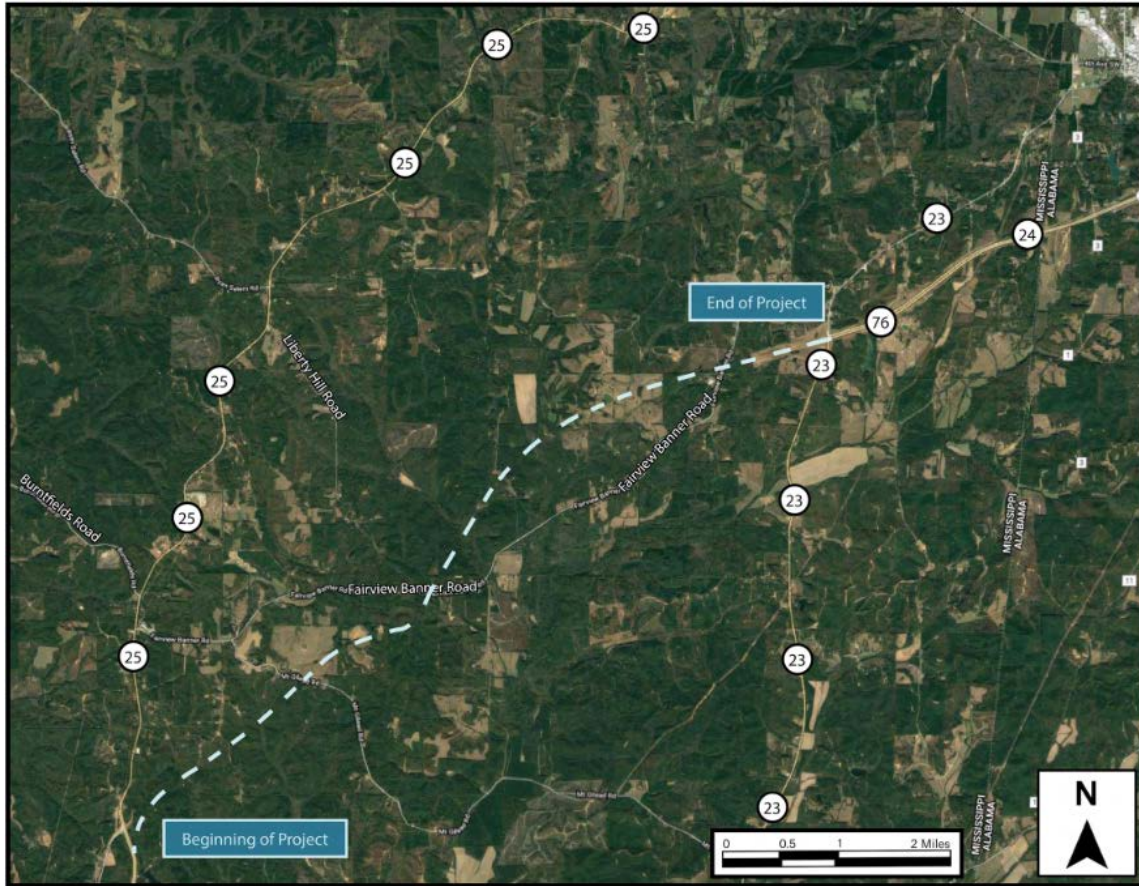
Characteristics of Corridor V and Its State of Completion

Corridor V (U.S. 278, US 45, I-22, U.S. 78, MS 25, MS 76, AL 24, US 72) runs 118.8 miles from I-55 at Batesville, MS to I-24 in Tennessee just north of the Alabama state line. Authorized for ADHS Funding are 108.4 miles. The only project currently under way on corridor V in Mississippi is the section between Fairview (at SR 25) and SR 23 near the Alabama state line, for which design and ROW acquisition have been completed. The state of Mississippi asked for federal funding within the INFRA grant program in March of 2019.

Mississippi Routes:	State Route 76, U.S. 278, State Route 25, U.S. 78
Total length:	118.8 miles (108.4 miles authorized for federal funding)
Unbuilt segments:	8.3 miles
Completion year:	2022 (according to grant application)
Estimated Cost:	\$129.4 million (previously incurred and future cost)

¹ SR76 Grant Application : <https://www.infra76itawamba.com/infra-grant-application.html>

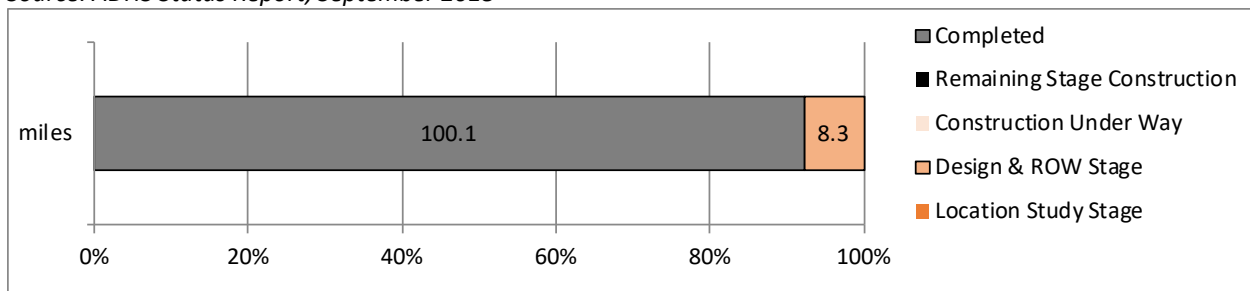
Figure 1: Map of Corridor V Area with the Mississippi / Alabama stateline
 Source: INFRA grant application (Gresham Smith)



Currently, 93 percent of the authorized corridor V mileage is open to traffic (as shown in Figure 2).

Figure 2: Length of Corridor V by Status (Authorized)

Source: ADHS Status Report, September 2018



Expected Local and Regional Effects of Corridor V Completion

According to interviewees representing organizations in northeastern Mississippi, as the unfinished section of the Appalachian Development Highway System's corridor V, the SR 76 project represents a critical link in a tri-state supply chain. Automobile assembly plants and parts producing facilities dot the landscape in Alabama, Mississippi, and Tennessee. These businesses rely on four-lane highways connecting auto manufacturers located near Jackson and Tupelo in Mississippi; Birmingham, Huntsville, and Montgomery in Alabama; and Chattanooga and Nashville in Tennessee. It is not uncommon for a single supplier to serve all auto manufacturers in the region, meaning their livelihood relies on seamless connections between assembly plants. These connections have become more urgent with the widening of the Panama Canal, which has increased the role of the Port of Charleston in South Carolina and Port of Savannah in Georgia, important deepwater ports serving the auto industry.

Completing SR 76 would provide cost savings to suppliers and manufacturers in the northern sections of Mississippi and Alabama. Currently, trucks between Tupelo and Huntsville must travel 13 miles on a two-lane highway that connects existing four-lane sections of the corridor. According to interviewees, this sometimes causes delays and safety hazards. Travel between Tupelo and Huntsville is expected to increase significantly with the opening of the Toyota plant in Huntsville. This is because parts will be exchanged between the existing Toyota plant outside Tupelo (Blue Springs) and the new plant. This is not a typical supply chain relationship, but rather a joint production operation between two plants manufacturing the Toyota Corolla program. Today, approximately five trucks make one round trip daily between the two plants, collectively carrying about 64 tons of freight. Once the new plant is fully operational, there could be 12 daily truck round trips carrying 150 tons. The travel time savings are estimated to be approximately eight minutes per trip if the SR 76 project is completed. Additionally, some of the suppliers would also benefit from shorter delivery times to either of the two plants. Representatives of Toyota MS expect some suppliers to move closer, if the Corolla program is successful, making it more likely that their trucks will travel on the new SR 76 and benefit from the implementation of the project.

Passenger travel will also increase as workers from the new plant travel to the old plant for training, and management staff travel regularly between plants. Interviewees believe these limitations deter new suppliers from locating along the corridor, especially those providing just-in-time delivery to assembly plants. In their view, the region will never realize the full impact of SR 76 without its completion. Small communities along the corridor will also benefit from the project. Commercial and retail development is concentrated around existing sections of the highway and that pattern would likely continue.

Benefits from completing SR 76 would not only accrue to the auto sector. Northern Mississippi has a vibrant furniture manufacturing industry that provides over 17,000 jobs; northern Alabama has a robust aerospace industry that provides 12,500 jobs. Commuting would become easier for many workers in these industries if SR 76 was completed. This benefit extends to students, faculty, and staff commuting to area community colleges. Itawamba Community College in Fulton, MS, which is located less than 10 miles from the missing highway link, enrolls over 5,000 students with many crossing the state line. Completing the corridor would likely attract even more students from Alabama who would be willing to pay out-of-state tuition for the increased convenience. Access to healthcare could also improve with the completion of SR 76. North Mississippi Medical Center in Tupelo is the region's largest hospital, employing around 6,000 workers, some of whom use SR 76 to commute to and from Alabama. Completing the corridor would also shorten response times for first responders in the region.

Completing the missing link would also support tourism in Tupelo and Muscle Shoals, Alabama, which are connected indirectly by SR 76. Even popular destinations like Memphis and Nashville would be more easily

reachable with the corridor’s completion. SR 76 also intersects the Natchez Trace Parkway, a 444-mile national park that attracted 6.3 million visitors in 2017. Huntsville International Airport is the nearest international airport for many people in this region, meaning SR 76 provides a critical link for long-distance travel.

SR 76 provides important intermodal connections in Alabama, Mississippi, and Tennessee. It currently passes the Port of Huntsville, which includes the Huntsville International Airport, International Intermodal Center, and Jetplex Industrial Park. The highway also intersects the Tennessee-Tombigbee Waterway (“Tenn-Tom”), a commercial navigation route linking the Gulf of Mexico to the Tennessee River. Completing the corridor would provide more seamless links to these intermodal connections. The Yellow Creek Port lies at the northern end of the waterway, and would likely see increased use of its water, rail, and highway connections if corridor V was completed. Labor access at the port would also improve, given that workers currently commute up to one hour in any direction.

Transportation Benefits and Costs of Corridor V Completion

The travel modeling estimates that completion of corridor V will produce longer travel distances (reflected in increased VMT, or vehicle-miles of travel) but reduced travel times (reflected in VHT, or vehicle-hours of travel), as shown in Table 1. The increase of travel distance by 383 vehicle miles per day is minimal, though. While the alignment of the new segment is shorter than the existing route, slightly longer trip lengths are expected in total because the new segment reduces travel time and will therefore attract traffic that today uses shorter but slower routes. The higher speed on corridor V leads to travel time savings of VHT of 193 hours per day. No additional gains in travel time reliability are achieved and no corresponding reduction of “buffer time”—the schedule padding done by time-sensitive travelers to allow for arrival time uncertainty.

Table 1: Corridor V Completion: Savings in Miles Traveled, Travel Time, and Travel Reliability

Savings	VMT (miles per day)			VHT (hours per day)			Reliability (hours per day)		
	Car	Truck	Total	Car	Truck	Total	Car	Truck	Total
2040	-330	-53	-383	114	79	193	~ 0	~ 0	~ 0

Source: Travel demand model Mississippi Department of Transportation / Cambridge Systematics

Besides the travel time and vehicle operation cost savings, additional safety benefits are expected as a consequence of a new highway with passing lanes and shoulders. The next largest benefits will be savings in logistics and supply chain costs. An increasingly high share of auto parts being carried on the road, especially between the two Toyota plants and their suppliers, increases the value of shipping goods expeditiously and in time along the corridor. This leads to a relatively high value for the logistics and supply chain savings.

Figure 3 compares the discounted present value of future cost and benefit streams associated with corridor V completion. The discounted present value of all benefits sums to a total of \$134 million, compared to a cost of \$86 million (based on a discount rate of 7 percent). The result of the benefit-cost analysis is a favorable benefit/cost ratio of 1.6 (meaning that benefits are estimated to be 1.6 times larger than costs) and a net present value benefit of \$48 million for corridor V. With a lower discount rate of 3 percent, the benefit-cost ratio rises to 2.6.

Figure 3: Costs and Benefits of Corridor V Completion (7 percent discount rate)

