

3. INITIAL HIGHWAY ECONOMIC IMPACT ANALYSIS

Transportation networks that facilitate safe and efficient passenger and goods movements are usually viewed as precursors to regional economic development. The economic benefits that accrue to regional economies often result in new business attraction, enhanced economic competitiveness and improvements in amenities. As such, regional planning authorities are often at the forefront of conceptualizing regional approaches to infrastructure improvement that could bring about such changes.

The Delta Regional Authority's development of a regional highway system traversing its 240-county and parish region is a step toward enhancing the region's economic potential. The extent to which highway investments can lead to increased economic opportunities is a key consideration that must play into the decision-making process and is the purpose of this analysis. It should be noted that this is a high-level analysis and is meant to serve as an order of magnitude in terms of establishing the potential for economic development benefits arising from highway investments in the Delta region. A more detailed analysis examining the system on a segment-by-segment basis is necessary to establish estimates at the level of detail that is typically used for the purpose of benefit cost analysis.

Subsequent sections will comprehensively address the sources of regional economic impact attributable to highway investment. Reviewing pertinent literature of the economic impacts of highway investment will provide insight into what DRA stakeholders could expect in potential economic returns from constructing the DDHS. In addition to the literature review, Wilbur Smith Associates' Economic Development and Growth Evaluation (EDGE) tool is utilized to show the potential employment and income benefits that could arise if transportation was significantly improved throughout the region.

3.1 Economic Benefits

Table 4 displays the results of the constructing the entire 3,843 mile DDHS. As can be seen, the economic impacts of constructing the DDHS creates thousands of temporary and permanent jobs for residents in the eight-state DRA region, as well as generates billions of dollars that will stimulate economic development throughout the DRA region.

Table 4 – Annual Economic Impacts of the Completion of the DDHS

	Annual Impact
Benefit from Increased Travel Efficiency	\$1.1 billion in personal income
Benefit from Increased Economic Development Opportunities	\$2.4 billion in personal income
Total Economic Benefit	\$3.5 billion in personal income
Employment (full-time equivalent)	130,000
Construction Jobs (temporary)	104,000 ¹

Of the estimated \$3.5 billion in annual personal income impact, \$1.1 billion is attributable to travel efficiencies such as travel time savings, vehicle operating cost savings and safety benefits. The remaining \$2.4 billion in annual personal income impact will result from additional business attraction and expansion opportunities arising from improved accessibility to developable land and markets and improved connectivity to economic centers. The average annual employment benefit of the increased travel efficiency and economic development opportunities of the DDHS is estimated to be approximately 130,000 full-time equivalent jobs with an average annual salary of nearly \$27,000. The industries most likely to experience growth include tourism related business such as hotels and motels, retail establishments and eating establishments; warehousing and distribution; food product manufacturing; professional services, including health and educational services; and non-durable manufacturing.

In addition to the longer term benefits of the system to the region, the act of constructing the DDHS will have significant temporary impacts on the region. Based on the estimated construction cost of \$18.5 billion, approximately 104,000 temporary construction jobs will be created throughout the eight-state DRA region.²

¹ A total of 155,000 construction jobs will be created by constructing the entire DDHS. This is not an annual job creation number.

² This estimate is derived using FHWA research on the Economic Impact of Federal-Aid Highway Investment showing that in 1996 for every \$1 billion of highway investments, 7,900 direct construction jobs are created. The PPI for materials and components for construction produced by the Bureau of Labor Statistics is used to convert the estimated construction costs of the DDHS to 1996 dollars and then multiplied by 7,900 to get the direct employment impact. It should be noted that the number of jobs and resulting income accruing to the Delta region will depend upon the degree to which those jobs are filled by permanent residents of the region.

3.2 The Sources of Regional Economic Impact

The sources of regional economic impact attributable to highway construction could generally be placed into three categories – direct impacts, increased economic efficiency and strategic development or business attraction impacts. The direct impacts are most commonly associated with highway construction, whereby employment and income created by construction jobs contribute positively to local economies. This type of impact is concentrated most heavily in the short-term and reduced significantly upon completion of the highway.

Transportation improvements lead to increased efficiency and thus, often bolster a region's economic competitiveness. Improved freight movements, better regional connectivity and mitigated congestion reduce transportation costs and frees up resources for other productive uses. This can lead to productivity increases and more competitive pricing. Given the changes in a firm's costs, the opportunity for capital reinvestment and expansion of the regional employment base becomes more likely positively impacting the region's economic performance. These types of impacts are on going and have the potential to significantly change the competitive environment in the DRA region and are included in this analysis.

Business location/relocation that may follow highway construction is an additional potential source of regional economic impact. In addition to more traditional industrial and commercial firm location decisions being impacted by highway construction, the emergence of “roadside service industries” (e.g. gas stations, restaurants, hotels) and new tourism may also be boons to local economies spurred by DDHS investments.

3.3 Highway Construction

A review of the literature concerning the economic impact of highway investment provides a number of “rules of thumb.”

- **Infrastructure improvements are necessary but not sufficient conditions for economic growth:** One of the few consensuses one could deduce from the literature is that well-connected transportation networks are necessary for development but not sufficient in and of themselves. It must be viewed as part of a more comprehensive regional effort to improve local workforces, ensure that local economic conditions are conducive to business location (reasonable tax rates, community support for

commerce, sound educational policies and visionary local leadership) and organized business recruitment campaigns.

- **Aggregate multi-county studies of the Interstate Highway System and Appalachian Development Highway System have found higher employment and earnings growth rates in counties served by the highways than those not served.** Studies of regional transportation networks have shown employment and earnings growth among counties impacted by regional networks. However, many of the studies lack concrete evidence that the highway themselves were the causal factors that have contributed to such growth. Rather, an identification of economic benefits and correlations between highway improvement and economic growth were presented.

A number of studies of the elasticities associated with improvements in highway capital stock show a clear linkage between highway improvement and changes in firm costs, labor, capital and other input demand. An additional set of “rules of thumb” is provided below.

- **The benefits industries derive from highway improvements differ across industries:** A number of studies have shown that regional economies do benefit from highway investments, but some industries benefit more than others. Those industries that more heavily rely on transportation, namely freight-intensive sectors, transportation and logistics as well as service industries where workers often commute especially benefit.
- **Most industries enjoy reduced costs as a result of highway improvements:** Empirical studies of cost elasticities with respect to changes in highway improvements have shown that costs typically decrease when highway capital stock improves.
- **Retail and manufacturing seem to especially benefit from highway improvement:** Researchers have concluded that retail and manufacturing industries particularly benefit from highway improvements. Given that both industries are freight-intensive, economic benefits that result from highway improvement seem quite likely and have been confirmed by empirical analysis.

- **Highway construction has shown a tendency to increase property values and development densities for locations in close proximity to highways:** Some studies have shown that highway construction may alter land-use in close proximity to highway construction. Improved accessibility often makes once vacant parcels candidates for sewer expansion and consequently residential and/or commercial developments thusly-exerting pressure on land values. Local governments, through expanded property tax bases, often benefit from such changes.
- **Industrial returns to infrastructure improvements diminish over time:** Many of the studies consulted show that the direct benefits attributable to highway construction diminish over time. Incremental changes in highway systems may benefit local economies, but they only do so at a decreasing rate.
- **Changes in highway network investment lead to larger changes in productivity growth in vehicle-intensive industries (e.g. Trade and Finance, Insurance, Real Estate, Transportation Equipment and Motor Vehicles and Construction):** In addition to manufacturing and retail, a number of other industries benefit significantly from highway construction including a number of service-oriented industries.
- **Cost reductions due to an increase in highway capital may lead to a reduction in output price:** Cost savings that accrue to businesses as a result of lower transport costs and other savings associated with highway construction have been shown to contribute to lower per unit costs and lower prices for consumers.
- **Highway capital and private capital are complements:** Private capital elasticities with respect to physical capital improvements have been shown to be complementary. Lower costs often allow business to re-invest creating demand for private capital.

Understanding the decision-making process of firms is often quite useful for regional economic stakeholders. The role that improved transportation network linkages play in business location decisions has been the subject of a number of empirical studies attempting to illuminate the role that infrastructure improvements play in a firm's location decision.

“Rules of thumb” for the role that transportation plays in business location/relocation decisions are provided below.

- Traditionally, highway connectivity was a key consideration for many firms but its importance has diminished relative to other site attributes as the nation’s system has become more developed: Qualitative studies of industry site attribute preferences show that highway connectivity’s importance relative to other locational factors has diminished over time as the connectivity has become less of an issue for many areas, especially urban areas. Contemporarily, proximity to markets, workforce skill levels, state and local tax rates as well as tax incentives play more prominently into a firm’s decision locations than highway connectivity. Of course, this varies across industries and tends to more true for service-based industries as opposed to manufacturing and distribution.
- Travel and tourism can be affected by improvements in transportation but literature on the topic is scant; however, it can be assessed much like other topics linking economic development to infrastructure investments: Literature on the role that highway improvements play specifically for tourism is limited. However, studies have shown that tourist-oriented industries (e.g. lodging, eating establishments, retail) have benefited significantly from highway investments. It is reasonable to assume that the construction of a highway system could in fact improve the region’s tourist activity. An assessment of the DRA region’s attractions and the role that inaccessibility may play in inhibiting tourist activity may be merited to better understand the potential economic impact on tourism arising from the construction of a regional highway. If it is shown that a lack of connectivity or inaccessibility inhibits tourist activity at the region’s tourist attractions, constructing a regional system connecting these attractions could have sizable impacts on the region’s economy.

3.4 Policy Implications

Empirical studies have conclusively shown that improvements in highways do, in fact, reduce costs, contribute positively to output and productivity as well create demand for additional capital. However, the benefits that accrue to industry are not distributed evenly with some industries benefiting more than others. As such, policymakers would be well

served by identifying regional growth industries to assess which regions are most likely to benefit from highway construction. Having identified which industries were most likely to benefit, an assessment of regional economic bases could illuminate which highway investments make the best strategic investment. The EDGE tool takes into account growth industry projections that will better inform the estimation of the potential economic benefits of the proposed Delta Development Highway System.

3.5 WSA EDGE

As illustrated by the literature cited above, regional economic forces play prominently in determining the economic impacts facilitated by infrastructure improvements. Wilbur Smith Associates has developed the Economic Development and Growth Evaluation (EDGE) system, an analytical tool designed to gauge the larger regional forces that address business location decision and regional economic performance providing the economic context for the proposed highway system. The tool helps to identify under-performing industries in the region and evaluates the role that transportation disadvantages plays in lagging performance. For industries where a transportation disadvantaged is identified, the EDGE tool provides forecasts of regional economic impact of mitigating those disadvantages. By focusing only on industries with a documented transportation disadvantage, stakeholders are provided a more definitive assessment of the role that the proposed highway system would play in facilitating economic growth.

3.6 Overview of the EDGE Tool

The processes outlined in this analysis and carried out by the EDGE tool include three steps:

1. Identify under-performing industries.
2. Evaluate transportation disadvantage, and
3. Estimate impact of mitigating the disadvantage.

The first part of the report's *Economic Base Assessment* provides baseline economic profiles, trends and growth projections for 67 local industries in the counties and parishes in the eight-state DRA region. Each industry is evaluated in terms of the extent to which it experiences an economic performance gap and its potential for local business attraction. An

area is viewed as under-performing if either (a) that industry's share of local employment is significantly lower than its corresponding share in a comparable area, and/or (b) local employment changes in that industry lags behind that industry's national average performance.

A second element of the analysis is evaluating the role of transportation in the under-performance of the industry. This is accomplished by evaluating local business growth/attraction potential for each industry through ratings of area attributes for supporting business growth and attraction. Advantages and disadvantages are defined on the basis of: (1) costs of labor, materials, utilities, transportation and taxes, and the sensitivity of each industry to those cost factors; (2) size and characteristics of the local area's workforce, and the sensitivity of each industry to these labor force qualities; and (3) quality and supply of local infrastructure and facilities to serve economic growth. By evaluating key competitive factors, the EDGE tool identifies those industries in which transportation is considered to be a primary deterrent to growth. For example, each industry is evaluated in terms of how much transportation they require and the efficiency of transportation services in the DRA region relative to the remainder of the counties and parishes in the eight-state region.

The final step in the analysis is to estimate the benefits in terms in increased employment and income in the region arising from highway investments that mitigate the transportation disadvantage. This impact is estimated by assuming that the highway investments could allow the under-performing industries in the region that demonstrated a transportation deficiency to grow at the same rate as the comparison region, which for the purpose of this analysis are the remaining counties and parishes in the eight-state DRA region.

3.7 Local Economic Performance Analysis

The first data collection and analysis element of the EDGE tool evaluates the mix and performance of industries in the DRA region by comparing it with the rest of the counties and parishes in the eight-state region. This technique is used to identify which industry clusters are potential sources of future economic development for the DRA region. Previous literature identifying which industries are most likely to benefit from highway construction will allow for the assessment of the role that the proposed highway could play in bolstering projected growth industries.

3.8 Business Trend Comparison

The business trend comparison component of this analysis uses Shift/Share Analysis techniques to compare the performance of DRA region industries with national performance trends in the same sectors. This technique provides a way to identify regional industries that are particularly thriving or declining and to compare their performance with national industry performance. Those local industries lagging in growth behind comparison area averages may be seen as weaknesses, but they also represent potential future growth opportunities.

The EDGE tool calculates the percent change in the number of employees in each sector for the DRA region and the U.S. over the past ten years. It then computes the ratio of these percentages, which indicates whether the local industry is growing or declining faster or slower than the national industry, or if it is moving in an opposite direction from the national industry (e.g., declining while the national industry is growing or vice versa). The ratios derived from this analysis allow for the identification of under-performing industries.

3.9 Regional Cost Characteristics

An important consideration in business location decisions is costs. All other considerations being equal, businesses tend to locate where they can minimize costs. Costs of labor, housing, electric power and taxes are foremost in this locational calculus. Data regarding these factors are entered into the EDGE tool, which identifies the types of businesses that are most sensitive to each cost factor.

The EDGE tool evaluates where the DRA region's total production costs are advantageous or disadvantageous for each of 67 detailed industries based on the following detailed cost data for the DRA region:

- *Labor costs.* The average wage per hour can be the deciding factor for industries evaluating locations for new production facilities.
- *Electricity costs.* Electricity costs vary widely by region. Power costs can be paramount in determining the location for heavy industries, such as primary metals, which use a lot of power. Costs of other utilities (e.g., natural gas) are also important for some industries.

- *State and local taxes.* Though taxes appear to be minor elements of total business costs, they are an important consideration for businesses seeking to minimize total costs, and they can also be an indicator of the business climate of the area. While the importance of state and local taxes is reduced by their deductibility from federal taxes, taxes are still an important factor influencing some investment and business location decisions.
- *Housing costs.* A cost of both owning and renting residences is a factor that most businesses take into consideration before finalizing decisions about new locations. Housing costs are particularly important for businesses that relocate staff and reimburse them for excessive housing costs incurred by transferees into a new, higher cost area.

Most importantly, the importance of each of these cost factors differs systematically by type of industry. The EDGE tool uses this data to identify how these local factors are area advantages or disadvantages for growing various industries.

3.10 EDGE Results

3.10.1 Competitive Disadvantages

Though a number of industries are projected to expand, the DRA region must address its competitive disadvantages. The EDGE tool identified two competitive disadvantages that may inhibit future economic growth, workforce skill levels and land costs.

Relative to the rest of the nation, the DRA region has lower levels of educational attainment, which limits the types of employment it can attract. As the national economy continues its shift toward a more dominant services sector, the level and supply of skilled workers will play a prominent role in firm location decisions and regional economic performance. Strengthening local workforces through improving K-12 education, ensuring that technical schools serve the needs of local industry and more effective usage of workforce development centers to augment the efforts of technical schools should aid in this effort.

For a few primarily manufacturing industries, land costs were seen as competitive disadvantages. As such, tax incentives that lower the cost of land acquisition and include favorable rates of property taxation may be merited.

3.10.2 Competitive Advantages

The DRA region's competitive advantages are noteworthy and should be considered as regional attributes. Regional wage rates compare quite favorably to the national average. However, lower wages are also indicative of a labor market that is comprised predominantly of employment that does not necessarily bode well for sustainable development. As the DRA region looks to develop economically, jobs that improve the region's standard of living and boost the region's wage levels should be the objective and should inform development priorities. Nevertheless, lower wages are a regional advantage that could be an attractive lure for firms looking to locate in the region.

In addition, regional energy costs and taxes (property, sales and income) are lower than the national averages. Each of these attributes represents lower costs of conducting business in the region and should be promoted as such.

3.11 Conclusion

This analysis provides a number of conclusions that will assist the DRA stakeholders in considering the construction of the DDHS. Stakeholders should consider this initiative as a part of a comprehensive regional development plan. The consensus amongst transportation economist suggests the DDHS could be best viewed as a facilitator of economic development as well as a catalyst of development. In addition, some firms are more likely to benefit than others as the benefits that accrue to regional economies from infrastructure investments are not equally distributed throughout the economy. A number of other factors that also play prominently in firm location decisions also help determine the extent to which economic development follows highway construction (e.g. proximity to markets and inputs, lower taxes and utility rates, workforce skill levels). This analysis has shown that a number of sectors have the potential to expand in the future if transportation disadvantages are mitigated. Once the DDHS is constructed, an estimated \$3.5 billion in annual income impact is estimated to occur throughout the eight-state DRA region.



Bob Riley
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Joe McInnes
Transportation Director

December 7, 2006

Mr. Pete Johnson
Federal Co-Chairman
Delta Regional Authority
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Suite 400
Clarksdale, Mississippi 38614

Dear Mr. Johnson:

I would like to take this opportunity to express my comments regarding the Delta Development Highway System (DDHS) plan and its benefits to the State of Alabama. I agree that the priority projects consisting of U. S. Route 43 from Interstate 65 in Mobile County to Interstate 20/59 in Greene County, U. S. Route 80 from Interstate 20/59 near the Mississippi line in Sumter County to Montgomery and from Interstate 85 in Macon County to Phenix City and U. S. Route 84 from the Mississippi line to Interstate 65 in Conecuh County should be designated DDHS Routes.

I am aware of the importance of the need for improvements on these routes and the major impact it will have on the economically distressed areas involved along with the potential growth to industry. Improvements in these routes should also provide major relief during periods of disaster related to hurricanes and other factors.

The Department is very appreciative of those involved in this planning study and your efforts to finalize the results as the plan nears completion.

I respectfully request your assistance in securing all available funds for improvements on these designated routes.

Sincerely,


D. J. McInnes
Transportation Director

cc: Jeff Carroll, Wilbur Smith Associates

DJM/CRP/ask