

1.0 Introduction

1.1 BACKGROUND

The Appalachian Development Highway System was originally designated and funded to help generate economic development in the economically distressed Appalachian region by enhancing access in isolated areas and better connecting Appalachia to the interstate system. Significant transportation, trade and economic analysis of the Appalachian Development Highway System (ADHS) has been completed over the past 15 years, demonstrating the positive economic growth effects of the ADHS and the importance of trade route connections to domestic and international markets outside of the Appalachian Region. With 15 percent of the ADHS yet to be completed, this new study uniquely captures not only the economic benefits (and costs) of completing the remaining segments of the ADHS, but also the network benefits of a fully connected and linked ADHS, including national freight flows benefiting from this major highway system. See Figure 1.1 for a map of the ADHS corridors complete and yet to be constructed and thus open to traffic.

Prior to this current study, the most recent extensive economic impact analysis of the ADHS was a report from July 1998 that found positive economic and travel efficiency returns to ADHS investments.⁷ It differs significantly from this current effort in several key ways that are worth noting so as to avoid unproductive comparison:

First, the 1998 study focused exclusively on the 12 completed ADHS corridors and corridor segments rather than completion of the entire system. The earlier study modeled segment-level traffic conditions rather than a fully networked system depicted by a travel demand model.

Second, freight flow data has improved significantly since the 1998 report, thus allowing for a more thorough and detailed estimation of local, regional, and national freight flows. The current study uses the most current Federal Highway Administration (FHWA) Freight Analysis Framework (FAF) historical (2002) and projected freight flow data (2020 and 2035) building on a county-level freight flow database developed for ARC by Marshall University and Wilbur Smith Associates.

Third, while the 1998 study does estimate economic development effects based on travel efficiency gains, it does not include additional regional economic development gains due to improvements in market accessibility and

⁷ Wilbur Smith Associates, *Appalachian Development Highways Economic Impact Study*, Appalachian Regional Commission, July 1998.

network connectivity. Further, this new study incorporates findings from recent statistical research on how ADHS economic development benefits vary in timing and magnitude depending on the type of county (rural, distressed, adjacent to metropolitan areas, etc.).

Fourth, this study includes three detailed case studies of ADHS corridors that provide real world context for the economic and trade benefits accruing to and expected from corridor completion. These detailed analyses, with input from local businesses, economic development officials and freight shippers and receivers was used to validate and calibrated the economic development benefits estimated in the quantitative modeling approach.

Figure 1.1 ADHS Corridors

Appalachian Development Highway System as of September 30, 2007



Source: Appalachian Regional Commission

Outputs from this study include a full range of transportation performance and economic development indicators, including:

Travel-time savings, route diversion, and market accessibility;

Direct user benefits, and additional economic development and tourism effects;

Total economic impacts (e.g., employment by industry, gross regional product, personal income); and

Benefit/cost ratios and net present value.

Results are presented for two perspectives – the ARC region (410 counties in 13 states) and the entire United States. Since the ADHS has specific objectives in terms of increasing economic development opportunities for the Appalachian Region, the regional perspective on benefits of completing the ADHS is essential and informative. In addition, U.S.-level economic efficiency benefits of completing the ADHS are provided to demonstrate the national benefits of ADHS investment. Reflecting the unavoidable uncertainty inherent in any forecast, estimates of future benefits are provided in terms of a range of likely effects.

The remainder of Section 1.0 provides an overview of the study approach, while the report is organized into the following sections and appendices:

Section 2.0 Methodology – Models and Data;

Section 3.0 Detailed Corridor Analysis Summaries;

Section 4.0 Travel Impacts, User Benefits and Accessibility;

Section 5.0 Economic Impacts;

Section 6.0 Benefit/Cost Analysis; and

Technical Appendices – (A) Travel Demand Model, and (B) Market Access and Economic Development Impacts.

1.2 STUDY OBJECTIVES AND OVERVIEW OF IMPACT MEASURES

The primary objective of this study is to estimate the economic impacts of a completed ADHS network, focused on the benefits of completing the final corridor segments. To do so requires the development of two travel and economic forecasts: 1) a “build” scenario with all remaining ADHS corridors fully completed; and 2) a “no-build” scenario that includes ADHS corridors already built or under construction, but does not include the remaining 15 percent of the system. Differences between these two future scenarios are estimated in terms of numerous factors:

Travel Performance Impacts – Comparisons of travel performance between the “build” and “no-build” scenarios within the networked travel demand model (which includes a thorough highway network of interstate, state, and local highways in and surrounding the ARC region) produces raw travel efficiency metrics such as vehicle hours of travel (VHT), vehicle miles of travel (VMT), and average speed for all trips (freight, nonfreight truck trips, and automobile).

User Benefits – Applying values of time and vehicle operating cost parameters to the travel performance impacts produces monetary benefits to the users of the ADHS corridors (and other regional highways experiencing changing traffic volumes). User benefits are measured in terms of travel-time savings, vehicle operating costs (fuel and nonfuel) and safety, varying by trip purpose (business, personal, commute) and vehicle type.⁸

National, Regional, and Local Freight Flows – As briefly mentioned above, this study incorporates comprehensive freight flow data based on FHWA’s FAF historical and projected trade data, as well as detailed county-level origin-destination trade flows to allow the estimation of benefits to short- and long-haul goods movement. For example, over 65 percent of freight benefits are external to the ARC region, reflecting the long-distance nature of the shipments impacted and the national importance of completing the ADHS to facilitate goods movement throughout the ARC region.

Improvements in Market Access – In addition to more traditional travel efficiency user benefits, this study also estimated improvements in market accessibility due to increased travel speeds in parts of the ARC region. Measuring accessibility is especially important in more remote areas that typically do not have high-traffic volumes or congestion, but where improvements in accessibility to other transportation facilities or destinations can create a more competitive business environment. Market accessibility was measured in terms of:

- Increase in labor force accessible within a typical commute time (e.g., 60 minutes);
- Increase in buyers/suppliers within a three-hour one-way drive; and
- Reductions in travel time to nearest transportation facilities (e.g., airport, marine port, intermodal rail yard, international gateway).

Economic Development and Tourism Effects – Improvements in market access for ARC counties and communities increases regional competitiveness and thus can lead to expanded economic growth opportunities. These effects are estimated using the Local Economic Assessment Package (LEAP), a framework originally developed for ARC together with statistical analysis

⁸ Reliability benefits were also estimated as part of this study but are not included in the results within this report based on what were deemed unrealistically large effects.

findings on the timing and size of ADHS economic benefits. These estimates also take into account regional and national offsets (i.e., the extent to which expanded growth in one part of the region could mean lower growth in other parts of the region).

Total Economic Impacts - Expansion of economic activity, driven by the direct effects on business cost savings, market access growth, intermodal connectivity improvements and associated economic multiplier effects. The Transportation Economic Development Impact System (TREDIS) was used to estimate both the direct effects on costs, market access, and connectivity, and the total effects on expansion of industry in the region. Economic growth was measured in terms of jobs, business sales, gross regional product (value-added), and wages.

Benefit/Cost Analysis - To gauge the economic return on investment and place these benefits in appropriate context, benefit/cost ratios and estimates of net present value are estimated from both the regional and national perspectives. The ARC regional perspective includes economic competitiveness gains not reflected in the national economy, while the national perspective includes all travel-related economic efficiency benefits (including ARC region through-trips). Future predictions of cost-to-complete the ADHS incorporate accelerated construction inflation assumptions consistent with recent historical data on cost escalation.

