

Economic Benefits of the Appalachian Development Highway System: A Look Back and a Look Forward

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Economic Development Corridors

- The Appalachian Development Highway (ADHS) system was the first highway system explicitly authorized by Congress for economic development purposes.
- A growing number of existing and proposed federal, state and local transportation projects have been justified on economic development grounds.
 - NAFTA and Border corridors
 - High-speed rail corridors
 - Economically Distressed Regions

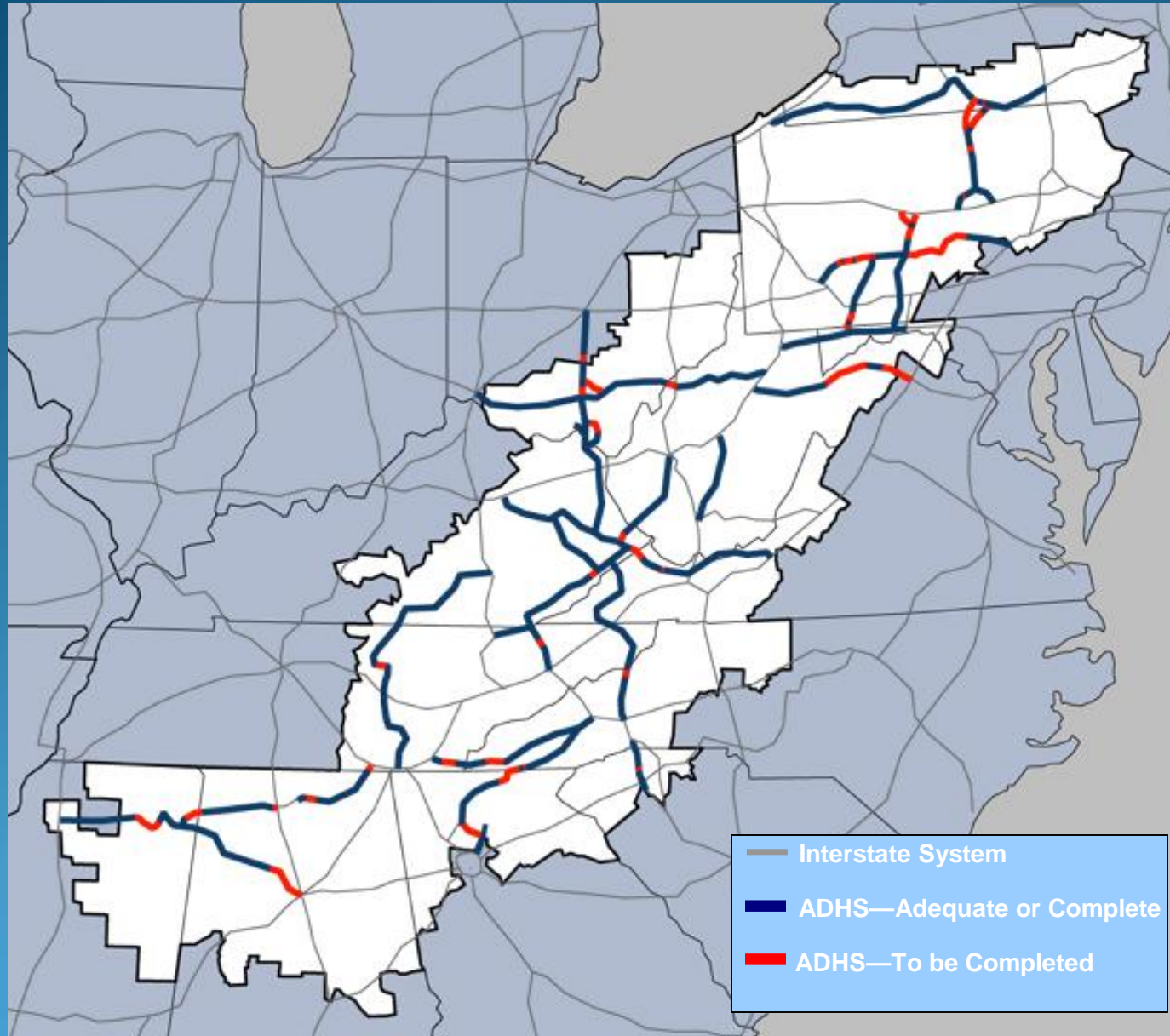
National Interest in Evaluating Economic Development Highways

- Federal Highways Administrations & Transportation Research Board Studies.
- Case studies and appraisals of the criteria and available evidence for judging the merits of such investments.
 - Recognition of the need to improve the range of tools for decision makers to analyze economic development impacts to support budget assessment.
 - Ex. Strategic Highway Research Program (SHRP2): data envelopment and large-scale case study and meta-analysis of pre- and post-completion studies to enhance decision making tools.

ADHS Research Agenda Illustrates Evolution of Data and Techniques

- ADHS is well studied; a review methods, evidence and data issues highlight potential improvements in evaluation process.
- Review of evolving criteria and measures used in variety of studies:
 - § Surveys, statistical techniques, regional economic models, trade & transportation studies, GIS-Network models.
 - § Discuss ARC research to improve data on highway completion and fund innovative transportation research.

Appalachian Development Highway System



- 3,440 miles system

- 3,090 authorized for improvement

- In FY 2009 2,715 total miles open to traffic or under construction

Evolving Role of ADHS

- From its inception, the ADHS highway system was designed to be an instrument of economic development:
 - Originally envisioned as linking key centers in the region to national markets on eastern seaboard and mid-west.
 - Improving regional traffic efficiency by connecting to the interstate system
 - Facilitating access to jobs and public services, and
 - Opening up remote areas within Appalachia for development and job creation.
- ADHS has become part of integrated transportation network geared to national & international markets.

Criteria and Measurement of Economic Development Impacts of Highways

- Several criteria have emerged in the literature as standard outcome measures of economic development impacts for highways:
 - § personal income or earnings,
 - § full-time employment or job years,
 - § population growth,
 - § value-added for the gross regional product of the impact region,
 - § business sales & business formation,
 - § and to a lesser extent property values and tax base effects.

Outcome Measures & Study Methods

- Outcome measures reflect the effects of transportation efficiencies and improvements in accessibility that enhance business productivity and worker mobility.
- Study Types range from:
 - § Surveys and accessibility studies,
 - § to multivariate techniques,
 - § to regional economic models,
 - § to trade and transportation studies,
 - § to GIS-based network accessibility modeling studies.

Early Survey-Based & Location Impact Studies of the ADHS

- Ex Post surveys & manual location studies in 1975 and 1988 by Local Development Districts.
- Accessibility measures used to assess changes in market access for businesses to their suppliers, customers, and workers, & improved access for workers, commuters and consumers.
 - 1975: Assessed first 1,000 miles of ADHS and 500 miles of access roads on new business establishments within 30-minute drive of the interstate roads with 1,354 plant locations and 234,000 jobs.
 - 1988: 9,800 firms accounting for 560,000 jobs.
- Study concluded that ADHS alone did not induce business location but spatial location was not random, but transfer effects were recognized as likely.

Multivariate Statistical Studies of ADHS

- § Isserman & Rephann 1995 APA study compared mean growth rate differences ARC counties with statistical “twin” counties outside the Region over the 1969-1991:
 - § Counties with at least 3 miles of the ADHS grew 69 percentage points faster in income than their twin counties.
 - § Isserman 1996 study found non-metro counties grew 80 percentage points faster than twins.
 - § Yet, multivariate analysis was unable to establish a robust relationship between ARC programs (growth centers, distressed counties, and highway investments) and economic outcomes in Appalachian counties;
 - § Later researchers hypothesized that these results reflected poor measurement of program variables rather than weak program effectiveness.

Update of Twin County Study: 1969-2000

- To improve the quality of the highway investment variable, ARC surveyed State DOTs on the timing and characteristics of ADHS segments in their states:
 - including construction start and end dates, section length, number of lanes, access type, number of signalized intersections, and number of interchanges.
- Lynch (EDR Group) found relative to their non-ARC county twins, income in ARC counties had grown 131% more over the 1969 to 2000 interval.
- With “highway” variable disaggregated into “Interstate” and “ADHS” components, the study found the presence of an ADHS segment in a county explained a portion of differential income and earnings growth for 1969-1991 and 1969-2000.

Regional Economic Impact Models

- Wilbur Smith Associates 1998 study focused on 12 of the 28 ADHS highway corridors that were 75 percent or more complete.
- Compared benefits two scenarios: “built” case with the ADHS corridors, and an “unbuilt” counterfactual case with no ADHS for 1965-2015 period.
- Estimated competitive effects on business, roadside sales, destination tourism, non-business consumer savings.
 - Travel efficiency benefit/cost of 1:18 and \$4.89 billion.
 - Economic development benefits of 1.32 and \$2.9 billion.

Trade & Transportation Studies

- *Global Competitiveness of Selected Industries and Clusters in the Appalachian Region* by Jack Faucett and EDR Group, Nov. 2004.
 - Analyzed major transportation routes for six key Appalachian export product groups to the port of lading.
 - Role of 11 ADHS routes as key routes for exports, the potential of 16 of 23 corridors that had gaps that affect transport efficiency.
- *Meeting the Transportation Challenges of the 21st Century: Intermodal Opportunities in the Appalachian Region* by WSA & Marshall University, December 2004.
 - Analyzed regional Commodity Flow by Mode: Truck, Rail & Barge
 - Provided a baseline of intermodal connectivity to assess potential efficiency gains both regionally and nationally.

ADHS Completion Study

- Recognizing the potential for measuring the regional and national efficiency and economic benefits of the completed ADHS and its network effects within the national transportation system, ARC commissioned a study in 2007.
- The study built upon the analytical and statistical results of other recent economic growth, trade and commodity flow analyses of the ARC region
- Conducted by Cambridge Systematics , EDR Group, and HDR Decision Economics, the study developed innovative methods to measure the full national and regional efficiency and economic development benefits and measure the B/C.

Future Objectives of ADHS- Transportation Network Studies

- Taken together these transportation and trade network models can be extended to integrate updated state DOT and other data for new planning and research applications.
- Analyze spatial location of business, accessibility effects and transfer effects due to proposed multi-modal investments that would alter the dynamics of the completed network.
 - Analyze potential agglomeration effects in metro areas
 - Quantify potential benefits for rural and distressed areas based on strengths of local economic base.
- Identify the spatial location of health services, education and cultural amenities to examine accessibility benefits for non-metro areas