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Evaluating accessibility impacts of the proposed America 2050 high-speed rail corridor for the Appalachian Region

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ABSTRACT

Transportation improvements are often considered to be precursors of economic growth. This paper examines industry-specific 'attractiveness' due to changes in the transportation network for 23 counties in the Appalachian Region. The network improvements result from new highway construction and the proposed America 2050 High-Speed Rail (HSR) plan for the Piedmont Atlantic Megaregion. The impacted counties that are proximate to five HSR stations (Birmingham, Atlanta, Greenville, Charlotte, and Greensboro) are studied for potential accessibility changes between the years 2002 to 2035. The impacts are examined with respect to six key industry sectors found around the proposed HSR stations: manufacturing; retail; construction; mining, quarrying, oil and gas extraction; health-care services; and all other remaining industries combined. The analysis shows that, for transportation improvements with highways only (and no HSR), a decrease in accessibility for all the impacted counties occurs for the six industry sectors examined in the future year of 2035. The HSR speed of 150 miles per hour is found to be adequate enough to cause positive changes in potential accessibility of the directly impacted counties containing the Birmingham and Greenville HSR stations. With combined transportation network improvements from both highway construction and the new 150 mph HSR line, counties around the Atlanta and Greensboro HSR stations would see accessibility increases in 2035 compared to 2002 with respect to five industry sectors: manufacturing; retail; construction; health-care services; and all other remaining industries combined. However, accessibility changes with respect to mining, quarrying, oil and gas extraction would be positive specifically only for the indirectly impacted counties around the Atlanta HSR station and the county containing the Greenville HSR station. This clearly shows differences in the spatial distribution of attractiveness for different industry sectors across the impacted counties along the HSR corridor. Thus, this exploratory analysis could serve as an aid to proactive public policy decision-making for large-scale transportation network improvements, such as the HSR, in understanding and improving economic activities for different industry mixes across other regions of the United States.

1. Introduction and background

Traditionally, improvements in transport infrastructure have been known to bring about economic growth in a region. An important driver for economic development is the change in accessibility resulting from the new transport-related infrastructure improvement. Significant changes in transport accessibility can induce shifts in the travel dynamics of householders who act as economic agents engaged in both leisure and work-related travel. When accessibility to key destinations is improved, it has the potential for expansion of markets and spatial agglomeration of industries (Lakshmanan, 2011). The fact that accessibility and industrial agglomeration go hand-in-hand has been the central tenet of new economic geography and, more recently, has also been reiterated by Song et al. (2012).

Location of industries near population centers has significant impact on livelihoods. Residents living closest to shopping and social-service facilities are more benefitted than those who are further away (Venter and Cross, 2011). The onus lies with the transportation authorities to ensure proximity to essential services and facilities to residents across different strata of society. Transport authorities in the U.S. have made continued efforts to improve access to geographically isolated and impoverished regions of the country with the goal of improving access to services and industries needed for economic growth.

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One particular region in the U.S. that has had the attention of the transportation authorities is the Appalachian Region. Various infrastructure improvements related to highway construction, as well as development programs implemented since the 1960s to reduce the region's geographic isolation from the rest of the country, are a testament to this attention. The U.S. Congress specifically designed the Appalachian Development Highway System (ADHS) in 1965 to "generate economic development in previously isolated areas, supplement the interstate system, connect Appalachia to the interstate system, and provide access to areas within the Region as well as to markets in the rest of the nation" (ARC, 2013:1). The Appalachian Region consists of 420 counties from 13 Appalachian states: Alabama, Georgia, Kentucky, Maryland, Mississippi, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Virginia, and West Virginia (ARC, 2013). As recorded in the recent American Community Survey of the 2010 U.S. Census, the region is home to more than 25 million people (Fig. 1).

Though the overall economic progress in Appalachia has been quite significant between the periods 2000–2008, traditional industries within the region such as mining, manufacturing, textiles, and paper and wood products continue to struggle due to intense global competition. While mining had the greatest industry growth from 2000 to 2008, employment in the manufacturing sector declined at a faster rate in Appalachia compared to other parts of the U.S. (Economic Overview of Appalachia, 2011).

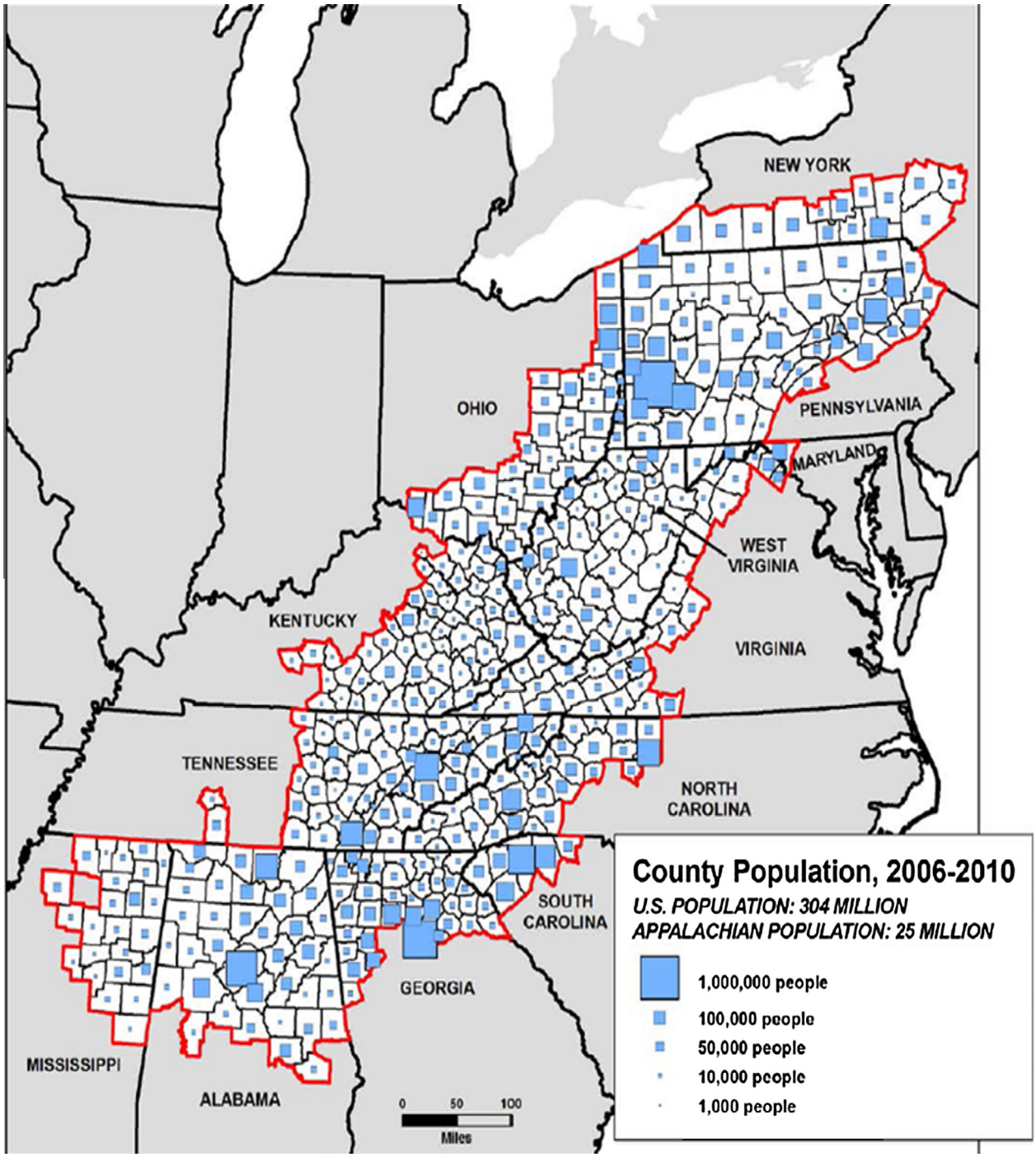

Fig. 1. Population distribution in the Appalachian Region, 2006–2010. *Source:* U.S. Census (2011), Pollard and Jacobsen (2012).