

## Chapter 111

# Relating Transportation Quality Indicators to Economic Conditions in the South–Central U.S.

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### ABSTRACT

*Investment in transportation infrastructure is widely assumed to spur economic growth, a belief that persists among both the general public and government officials. However, research has provided inconsistent evidence to date, and many researchers believe that good transportation is a necessary but insufficient condition for regional growth. This study examines the issue from a different perspective than the majority of past research, using spatial regression techniques to explore the relationship between transportation quality and regional economic development at an intermediate spatial resolution. Using federal highway statistics on pavement roughness and bridge quality, this research examines the relationship between measurable results of transportation spending, as evidenced by better quality roads and bridges, and various indicators of economic health. This relationship is examined in the South-Central U.S. (Arkansas, Kansas, Oklahoma, and Texas) at the county level and uncovers moderate to weak regression coefficients overall but with notable spatial variations across the study area.*

## INTRODUCTION

The link between transportation investment and economic development has generated much research but little agreement about the direction of causality, appropriate analysis methods, optimal spatial scales, or the meaning of results. However, expenditures on public works projects face ever-increasing scrutiny from a populace that demands evidence documenting the benefits. Given the complex nature of the U.S. economy, the myriad direct and indirect effects that transportation spending catalyzes (Kanakoglou, Anderson, & Kazakov, 1998), and the varied perspectives brought to the problem by economists, geographers, and planners, it seems unlikely that widespread agreement will ever emerge. Further, the polarization of American politics into extreme camps regarding governmental fiscal policy probably means that there will never be another public works project in this country, such as the U.S. Interstate System, that enjoys universal support and recognition for its positive impacts. As such, the best that can be achieved is the pursuit of multiple, parallel lines of inquiry in the hopes that such studies produce converging results that satisfy a majority of stakeholders. Such evidence would be useful to political leaders and policy makers when evaluating past and proposing future projects.

This paper approaches the problem from an explicitly spatial perspective, focusing on how the relationship between transportation quality and economic development varies across the study area. In contrast to project-specific, cost-benefit analyses (CBAs) most commonly conducted by economists, transportation departments, and governmental agencies, this paper takes a broader view by examining cross-sectional relationships across a larger study area in the South-Central U.S. In addition to expanding the scale of analysis beyond the individual project, this research is especially interested in the degree to which the relationship between transportation quality and economic health might vary spatially. Such

evidence would be useful to both planning and governmental agencies because it would provide guidance as to which portions of the study area might respond more directly and favorably to the economic stimulus of new transportation investments and presumably of improved transportation quality.

## MOTIVATION AND STUDY AREA

This research was spurred by questions about how the overall transportation inventory of an area influences its economic development. It was part of a larger project funded by an Oklahoma Transportation Center (OTC) grant that sought to measure Oklahoma's comparative transportation advantages with respect to its neighbors. This paper specifically evaluates linkages between economic development and transportation infrastructure with a goal of assessing the strength and spatial variation of the relationship between highway conditions and socioeconomic indicators across Oklahoma and three of its neighbors, Arkansas, Kansas, and Texas (Figure 1). These three states are included because they are more integrated and connected to Oklahoma via their long shared borders, enjoy relatively swift and smooth transportation routes between their major cities, and possess a strong degree of regional integration, traits that Oklahoma's other three neighbors, Colorado, Missouri, and New Mexico, do not exhibit to nearly the same degree.

In light of the fact that just \$27 billion of the \$787 billion "stimulus package" of 2009 was allocated to transportation projects (AASHTO, 2009) and the fact that many state governments have spent that money disproportionately in rural areas to satisfy constituents (Cooper & Palmer, 2009), this research is particularly timely given the heavily rural nature of the study area. Past research (Comer & Finchum, 2001, 2004, 2006) has demonstrated that highways are often the lifeblood of many small towns in Oklahoma, and

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