



Research Summary



Evaluating Private Sector Returns to Transportation Investments in Tennessee

Project Number:
RES2020-01

TDOT Lead Staff:
Terry Gladden
Strategic Transportation
Investments Division

Principal Investigator(s):
Dr. Matthew Murray | CoPi
Dr. Jilleah Welch | CoPi
University of Tennessee,
Knoxville

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WHAT WAS THE RESEARCH NEED?

Transportation planners are tasked with identifying specific investment projects that can yield the largest benefits for residents of Tennessee, including economic benefits. While critical to the planning process, quantifying the benefits of transportation investments is difficult to do. Additionally, transportation planners are very rarely able to conduct ex-post evaluations of economic returns to completed transportation infrastructure projects. Therefore, TDOT sought to examine the private sector returns of transportation investments across the state to better inform the Department's planning process.

WHAT WERE THE RESEARCH OBJECTIVES?

The research had three primary objectives:

- evaluate best practices to design a set of transportation infrastructure ROIs and identify factors affecting ROI;
- complete an empirical estimation of post project versus pre-project ROIs that capture private sector returns attributable to transportation investments; and
- conduct an analysis of the estimation results aimed at identifying the demographic, economic, and environmental factors that are associated with both well-performing and poorly performing transportation infrastructure investments.

WHAT WAS THE RESEARCH APPROACH?

An extensive literature review was conducted, specifically to guide a formal cost-benefit analysis, although this mainly consisted of limited or inconsistent research findings. The research team then developed a county-level database, which provided the foundation for the ROI analysis. For this database, the research team compiled three types of county-level data. First, they acquired interstate and state road project data from TDOT, spanning from 2001 to 2020. Second, they collected measures of private sector county economic activity, including employment, income, per capita income, business establishments, and population. And third, the team compiled county characteristics that might influence economic outcomes and the efficacy of transportation investments. An ex-post, descriptive assessment on completed infrastructure projects was conducted to calculate the ROI for each project by dividing the difference in economic activity before and after construction by the investment dollars for each project, allowing the team to evaluate associations between TDOT investments and economic outcomes. The research team also sought to establish causality between investments and private sector outcomes by using a panel vector autoregressive (VAR) model.

WHAT WERE THE FINDINGS?

The research revealed a mix of high return and low return investment projects in the same counties across the state. The research found no statistically valid positive association between transportation infrastructure investments and economic outcomes. The research team points to three possible explanations for these results: 1) modeling and empirical challenges, 2) the relatively short window of time this study was examining that might have hindered the ability to enable a significant private sector response to transportation investments, and 3) transportation investments may have enabled communities to continue to grow consistent with their historical trajectories, rather than causing economic activity to expand or contract.

IMPLEMENTATION AT TDOT

While the research was unable to provide evidence of a correlation between transportation investments and county-level economic growth, improving Tennessee's transportation network is still the agency's top priority. TDOT will continue to make transportation investments that improve infrastructure while leading to better access and support the economic growth of communities across the state. As the relationship between transportation investments and economic growth will remain a policy question, TDOT may explore this further in the future through additional research. A future study may require: 1) a longer time window to examine investments as impacts may take a long time to be realized, 2) alternative approach to estimate spillover effects, and 3) an alternative modeling structure built around the production function framework that is most commonly used to conduct a study of this nature.

MORE INFORMATION

Find the final report here: https://www.tn.gov/content/dam/tn/tdot/long-range-planning/research/final-reports/res2020-final-reports/RES2020-01_Final_Report_Approved.pdf.

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