Commission Briefing Paper 4K-06

Economic Impact Analysis in Public Sector Infrastructure Investment Decisions

Prepared by: Section 1909 Commission Staff
Date: January 11, 2007

Introduction

This paper is part of a series of briefing papers to be prepared for the National Surface Transportation Policy and Revenue Study Commission authorized in Section 1909 of SAFETEA-LU. The papers are intended to synthesize the state-of-the-practice consensus on the issues that are relevant to the Commission's charge outlined in Section 1909, and will serve as background material in developing the analyses to be presented in the final report of the Commission.

This paper presents information on the role of economic impact analysis (EIA) in evaluating how surface transportation projects affect employment, business growth, sales revenues, land values, and other economic issues of importance to decision-makers and the public. It describes the relationship of EIA to benefit-cost analysis (BCA) (see Paper 4K-05) and briefly discusses different EIA measures and methods.

Background and Key Findings

Economic impact analysis (EIA) is the study of how the direct benefits and costs of surface transportation projects (e.g., travel time savings or reduced crashes) affect the growth of local, regional, and national economies. This paper makes several findings:

- EIA measures changes in jobs, business growth, sales revenues, land values, and other effects of surface transportation projects on the economy. It also provides information on the distribution of these effects to different groups and sectors within the economy.
- EIA complements, but is distinct from, BCA, which measures the direct impacts of transportation projects on project users and non-users, including changes in travel times, crashes, vehicle operating costs, agency construction costs, and pollution costs.
- The direct benefits and costs of transportation improvements (measured using BCA) are converted into wider, indirect, economic impacts (measured using EIA) through the operation of the marketplace.
- Economists generally hold that, in a perfectly competitive market economy, the converted, indirect impacts of transportation projects measured by EIA would not add to the net value of the direct transportation benefits and costs measured using BCA—rather, the indirect economic impacts are simply a restatement of the direct benefits and costs.
- It is important to understand the approximate equivalence of BCA and EIA values when considering infrastructure investments. A project whose transportation benefits do not exceed its costs will not generate net economic impact benefits for the Nation. Rather, it could hurt national economic growth by consuming resources that could have been used more productively elsewhere in the economy.

- In some cases, a public agency may undertake a project whose direct costs exceed its direct benefits as a means of promoting economic growth in an economically distressed region. In such cases, if the majority of funds are provided from sources outside the region, and benefits are realized largely within the region, the region may realize net benefits even as the broader economy experiences net losses.
- The labor and resources consumed in building a project represent costs, not benefits, of the project. However, if funding for the project comes from outside the region, the local perception of such spending is that it is beneficial. These local benefits stem from the transfer of revenues into the region and are not directly attributable to the project itself, except insofar as the project is the vehicle for the revenue transfer.
- There are various tools for conducting EIA that range in sophistication from basic business surveys and market studies to complicated production function analyses and regional economic modeling. All such tools have limitations and can yield very different estimates of the economic impacts of transportation projects. Accordingly, EIA results should be interpreted carefully and in relation to the direct impacts calculated using BCA.
- The systematic use of EIA in the planning and evaluation of surface transportation projects could yield significant benefits to society by ensuring that the effects of transportation projects are well understood before scarce resources are committed to them. Most public agencies, however, make only limited use of EIA in the evaluation of such projects.

Definition of Economic Impact Analysis (EIA)

EIA, also called economic development impact analysis, studies the ways in which the direct benefits and costs of transportation projects (such as travel time savings and construction costs) affect the local, regional, or national economy. It measures the consequences that a project or action will have on considerations such as local or regional jobs, business growth, sales revenues, land values, and other factors. As used in this paper, EIA should not be confused with Environmental Impact Analysis as related to requirements of the National Environmental Policy Act of 1969 and other environmental laws, regulations, and guidance.

Distinction Between EIA and Benefit-Cost Analysis (BCA)

BCA measures the direct benefits and costs that a project causes for highway agencies, travelers (users), and, in the case of environmental externalities, non-users affected by the project. Direct benefits and costs include changes in travel time, crashes, vehicle operating costs, agency construction costs, and pollution costs. BCA typically does not measure how these direct benefits and costs are converted into indirect effects on the economy, such as changes in employment, business sales, or land values. This is the role of EIA.

Economists generally hold that, in a perfectly competitive market[1] economy, the converted, indirect effects measured by EIA would have the same net monetary value as the direct transportation benefits and costs captured in a comprehensive BCA (Standing Advisory

[1] In a perfectly competitive market, no producer or consumer has the market power to influence prices. Typically there are many buyers and sellers, the products are perfect substitutes, firms and consumers have complete information on the market, and all agents have equal access into and out of the market.

Committee on Trunk Road Assessment (SACTRA), *Transport and the Economy*, para. 23-26).[2] For example, as explained in Paper 4K-05, a project that improves access to an area by reducing travel times would cause property in the area to become more desirable by virtue of this improved accessibility. Travelers living in, or desiring to live in, the affected area would transfer some of the value of their travel time savings (measured using BCA according to the value of a traveler's time in dollars) to property owners in the area in the form of higher rents and housing prices (measured using EIA). The property value increase is therefore not an additional value to travel time savings, but rather reflects the capitalized or "transferred" value of the time savings. Other types of transfers occur as well (e.g., workers may accept lower wages in response to lower commuting costs). A frequent error in the conduct of both BCA and EIA is the mixing together of direct and indirect benefits and costs—such as travel time savings and property values in the above example—leading to overstatements of a project's true net benefits.

As a matter of best practice, EIA results should be presented as a complementary analysis to the BCA. BCA results show whether a project is worth the resources that will be invested in it from a total social welfare standpoint. EIA results are helpful in informing decision makers and the public about how and in what form the benefits and costs of the project will ultimately be distributed within the economy. Information from both analyses may be summarized in a recommendations package and considered jointly in reaching a decision on whether or not to go forward with a project. The EIA results should neither state nor imply, however, that the monetary value of indirect economic effects is additional to the net value measured in the BCA. To do so would overstate the economic justification of the project by effectively double counting the project's net benefits.

Approximate Equivalence of EIA and BCA Net Benefit Values

According to economic theory, thorough EIA and BCA studies would provide approximately the same net societal value of a project, although the benefit and cost categories would be grouped differently. In practice, however, the net values measured in EIA and BCA will diverge from each other for several reasons.

One important reason for this divergence is the purely practical problem of measuring a project's full range and value of benefits and costs. Many direct impacts of a surface transportation project, such as network travel time savings or environmental externalities, can be difficult to capture fully in a BCA. The General Accounting Office (GAO) notes there are numerous limitations to accurately predicting changes in traveler behavior, land use, or the use of nearby roadways or alternative travel options resulting from a new investment (GAO, *Benefits and Costs of Transportation Investments*, p. 11).

It is even more difficult in EIA to identify, measure, and assign monetary values to the full range of potential economic impacts resulting from a transportation improvement (see "Typical Economic Impacts Measured in EIA", below). In most cases, the magnitudes and linkages between direct and indirect impacts are not well understood (SACTRA, *Transport and the*

[2] In 1996, the Secretary of State for Transport of the United Kingdom asked SACTRA to consider the effects on the performance of the economy that might be caused by transport projects and policies, including new infrastructure, changing prices, demand management and measures to reduce traffic. The final report was issued in 1999 and may be accessed at http://www.dft.gov.uk/stellent/groups/dft_econappr/documents/page/dft_econappr_610277.hcsp.

Economy, para 12). Some EIA methods attempt to capture such benefits by correlating changes in transportation investment directly to changes in regional or national output and productivity, but it has proven difficult to measure net productivity benefits solely attributable to the transportation investment.

Another reason for the potential divergence of measured BCA and EIA net values is that our market economy is not perfectly competitive. In particular, markets may lack complete information since factor and resource costs may differ from the prices people actually pay for them due to subsidies, taxes, and externalities (SACTRA, para. 32-39). For example, when people decide to take an auto trip during rush hour, they do not perceive the full congestion cost that their trip imposes on others. Incorrect pricing of other non-transportation resources in the economy can also distort the translation of direct transportation benefits into indirect benefits. For instance, if the price of undeveloped land adjacent to a new roadway does not include the cost of schools, utilities, sewerage, and other services needed to support new development, land use decisions made by private individuals could impose costs on society that erode the value of the direct transportation benefits. Because of the widespread and often countervailing incidence of such pricing distortions, however, SACTRA concluded that there is presently no basis for judging in general that the net value of transportation project economic impacts is greater or less than the net value of direct effects (SACTRA, para. 37).

A third major reason for the divergence of BCA and EIA net values pertains to the effects of transportation on market competition and productivity. SACTRA notes that "One of the main impacts historically of improvements in transport has been to reduce the costs of long distance trade and thus to make markets better integrated. This is perhaps the aspect which makes transport infrastructure 'special' rather than simply a run-of-the-mill addition to the capital assets of the economy" (SACTRA, para. 4.02). Transportation projects can lead to greater productivity from increased competition and the reorganization of firms' activities, including the agglomeration effects (the synergistic benefits that firms obtain when locating near each other) and economies of scale in production. To the extent these effects occur due to a project, they would be additional to the direct benefits and costs measured in a project's BCA. For typical transportation projects in areas with developed transportation infrastructure, SACTRA reported that the overall ratio of total economic benefits to transportation benefits might be about 1.06 (SACTRA, para. 4.70 and 4.75). These economic effects could be much larger than direct transportation benefits, however, when a transportation project opens up undeveloped markets or markets previously not subject to competitive pressures.

Although the above caveats would apply to any comparison of net values estimated with EIA and BCA, the comparison still provides a valuable check on the results of EIA analysis. If the analyst calculates an indirect economic net value for a project that is significantly higher than the net value of the project's transportation and environmental direct costs (measured using a comprehensive BCA), then the EIA is likely to be overstating the value of the indirect effects.

Role of EIA in Measuring Economic Development Targeted to Distressed Regions

The preceding section noted that the net value of direct transportation benefits and costs should be approximately equal to the net value of economic impacts, and that this equivalence provides an important check on the validity of an EIA estimate of the net value of a project's economic

impacts. A corollary observation is that a project that has no direct transportation or environmental net benefits as measured using BCA will likely not generate net economic benefits for the Nation. Such a project could even hurt national economic growth by consuming resources that could have been used more productively elsewhere in the economy.

Beyond the strict economic BCA and EIA analysis, a public agency may legitimately undertake a non-cost-beneficial project as a means of promoting economic growth in an economically distressed region. For example, the goal of the Appalachian Development Highway System Funds authorized in TEA-21 is to foster and promote the economic and social development of the Appalachian Region.[3] The objectives of doing projects of this sort should be clearly understood, as should the negative consequences of the project for growth outside of the region.

Similarly, a surface transportation project might be undertaken specifically to induce a business or company to locate in a distressed region. For instance, a company might request that an intersection or service road be provided as a condition for its location or relocation to the area. From a local standpoint the justification for the project may be compelling, but from a State or national perspective the business-attraction effect of the project would likely be a wash. The gain of the business at one location often means that it will not locate at some other location where it otherwise would have if the improvement had not been made. Many localized economic impacts are simply transfers from one region to another.

Economic Impacts Caused by Project Construction

Particularly during periods of unemployment, there is a strong tendency for decision-makers to focus on economic activity driven by the construction of the project itself, i.e., the labor and resources consumed in building a project. Job creation and local sales associated with construction activities may be welcome effects of the project at the regional level, and numerous economic tools exist for calculating employment, output, and income effects associated with construction spending. These effects are most pronounced when funding for the project comes principally from outside of the region—if funded from internal regional resources the effects of project on regional jobs would be much more muted and possibly negative.

Decision-makers should not lose sight of the fact that these employment and other impacts stem largely from the transfer of revenues to the region from outside and are not directly attributable to the project itself, except insofar as it is the vehicle for the revenue transfer. From an overall State and national perspective, the labor and resources consumed by any project are costs, not benefits, and should not be treated as benefits in either EIA or BCA. It should be remembered that the taxes or fees raised from the public to fund the project would most likely have been spent elsewhere in the economy by the taxpayers had they not been collected, and would likely have generated comparable economic growth in those places.

Typical Economic Impacts Measured in EIA

The Transportation Research Board (TRB) notes that the single most common impact measured is employment (jobs), although personal income, tourism, land use/property values, and output are also popular measures (TRB, *Current Practices for Assessing Economic Development*

[3] http://www.arc.gov/index.do?nodeId=1040

Impacts from Transportation Investments, NCHRP Synthesis 290, p. 3). Table 1 describes typical types of impacts addressed in an EIA.

Table 1. Economic Impacts Measured Using EIA

Economic Impacts	Measure
Standard Measures	
- Regional output	Value of all business sales of goods and services, including intermediate products.
- Gross regional product (GRP) or value added output	Value of goods and services produced in the region that are not purchased for further processing or resale in the region. This is the most useful measure for representing real changes in economic activity.
- Wages or personal income	The dollar value of wages represents a portion of the value of output measures.
- Employment	Number of jobs.
Related Indicators	
- Productivity measures	Measures such as the ratio of output to cost of some input, showing efficiency.
- Capital investment	Money spent on improvements for land, construction of buildings, purchases of equipment, etc.
- Property value appreciation	Increases in appraisal values or rents for property.
- Miscellaneous other measures	Numerous other measures include tourism dollars, unemployment rates, changes in business composition, etc.

Source: Transportation Research Board, *Current Practices for Assessing Economic Development Impacts from Transportation Investments*, NCHRP Synthesis 290, Washington, DC, 2000, pp. 8-9.

Many of the impacts described in Table 1 can provide valuable information to the public and decision-makers about the ultimate distribution of a project's benefits to the groups and sectors within the region. Business owners, holders of property, and wage earners are better able to understand how improved transportation times will affect them both in the short and long term.

It is important to note that different EIA methods will measure different impacts. Some EIA methods, such as production function analyses (see "Methods of EIA", below) may focus only on regional or national output values, whereas other methods might incorporate a broad range of the impacts summarized in Table 1. Most of these impact measures are restatements of each other (e.g., changes in wages or incomes represent a portion of GRP and output measures) and should not be added together in the same analysis. Moreover, some measures, such as regional output as measured in business sales contain internal double-counts of impacts (i.e., business sales include the prices of intermediate products at the point of sale and again through the sale of the final product of which the intermediate goods are a component).

It follows that extreme care must be used when trying to calculate a net value for impacts measured in an EIA. This difficulty is one reason why the calculation of the value of net transportation benefits for a project using BCA is so important, since it establishes the approximate upper bound for the value of economic impacts of projects in areas with well-

developed surface transportation infrastructure. In addition, the transportation benefits measured through BCA are often critical as a data input to the EIA methods discussed below.

Methods of EIA

There are many different levels of sophistication in EIA (TRB, NCHRP Synthesis 290 and Federal Highway Administration, *Economic Analysis Primer*). The best method and level of effort for any given project depends on the scale, complexity, and controversy of the project.

Basic methods of EIA include survey studies, market studies, and comparable case studies. Survey studies may take the form of expert interviews (e.g., with businesses along a route), vehicle origin-destination logs, collection of shopper origin-destination data, and corridor inventory (windshield survey) methods. Survey studies are generally qualitative interpretations of the effects of transportation projects, preferably informed by BCA and other economic data pertaining to the transportation effects of highway projects. Survey methods would most appropriately be applied to small-scale projects with minimal network impacts.

Market studies consider demand and supply for business activity and then attempt to quantify the effects on the market of a change in transportation costs caused by a project. These studies can also be used to estimate changes in land values attributable to lower transportation costs. Comparable case studies are most often used to evaluate the localized economic impacts of a project on neighborhoods, downtowns, or small towns. This approach is applied to projects such as bypasses of small towns, where comparable projects and situations elsewhere in the same State or region can be readily identified and studied. In such studies, before-and-after employment, land use, business location, and other economic impacts can be studied in detail.

More advanced EIA methods encompass econometric analysis and economic modeling, including production function analysis and regional economic models.

Production function analysis seeks to capture productivity benefits not typically included in BCA and has been used extensively since the late 1980's. Studies using this method usually correlate growth in aggregate economic output with changes in public and private capital, including investments in transportation infrastructure. One study by David Aschauer in 1989 gained national attention when its results implied that each additional dollar of core public infrastructure investment yielded a return of almost $2 in output, suggesting that conventional BCA was severely undercounting the benefits of transportation investments to the Nation.

Subsequent work by economists challenged the findings of the Aschauer study. One particular problem with production function studies such as Aschauer's that rely on time series data (data that tracks changes over a number of years) is that, historically, output and investment measures move upward together, but their causal relationship is uncertain. In other words, it is difficult to determine conclusively how much of growth in output is caused by infrastructure investment, or vice versa, or how much of either is caused by a third factor (Eberts, *The Economic Justification of Road Investments*, p. 6). Production function studies rarely attempt to specify or model the mechanism by which infrastructure investment would lead to higher output, which would help to distinguish causality. Such modeling would also be important in measuring the productivity effects of dollars invested in projects meeting high vs. low transportation needs—something that

cannot be done with current production function estimates, greatly limiting their usefulness for project level EIA.

Researchers such as Nadiri and Mamuneas have attempted to control for time series data and other problems in production function analysis and find much lower estimates of economic growth due to changes in infrastructure investment (Nadiri and Mamuneas, 1994, 1996, 1998 and Mamuneas and Nadiri, 2003). When compared to the rates of return on private capital, they found that public sector investment yielded higher rates than private investment in the 1950s through the 1970s, whereas public sector investment has yielded lower rates of return since then, particularly in the 1990's. In their 1994 work, they found returns to road and highway investments of 8 percent. Other researchers have found even lower rates of return. Recent work by Shirley and Winston, which proposed a causal link between highway investment and firm inventory costs, found that "highway capital stock yields an annual rate of return that reach 17.6 percent during the 1970's but then falls to 4.9 percent during the 1980's and to a meager 1 percent by the 1990s" (Shirley and Winston, 2003).

It is important to emphasize that the rates of return estimated by production function studies do not distinguish among projects—a dollar invested in a project with very high net benefits cannot be distinguished from a dollar invested in one with no benefits. Given the variability of estimates and their lack of specificity by project, these estimates yield little information useful for a project level EIA. The more recent work in this area, suggesting relatively low rates of return for overall infrastructure spending, however, is generally supportive of other findings referenced in this paper that there are not large pools of productivity benefits which are missed in standard BCA.

Regional economic modeling is a more refined approach than production function analysis for estimating the economic impacts of a transportation investment. Regional economic modeling involves building a complete quantitative description of a regional economy, including the interactions of local industries with each other and industries outside the region, with households that supply labor and other factors of production, and with final users of goods and services. Modelers can then study the effects of a stimulus to the economy, such as those caused by a new transportation project.

The simplest regional economic models are direct applications of input-output models, which quantify the multiple economic effects resulting from a change in the final demand for a specific product or service. These applications are "static" in the sense that they provide an all-at-once view of economic effects, without a time component that is necessary for understanding when the effects will be realized. More sophisticated applications of regional economic models supplement input-output relationships with simulation techniques to forecast the year-to-year effects of projects on economic and demographic patterns.

Application of EIA to U.S. Surface Transportation Investments

The systematic use of EIA in the planning and evaluation of surface transportation projects could yield significant benefits to society by ensuring that the effects of transportation projects are well understood before scarce resources are committed to them. The TRB reports, however, that most public agencies do EIA only for large infrastructure projects for which the economic stakes are

high in terms of costs and benefits (TRB, NCHRP Synthesis 290). Few have a formal policy to include EIA as a regular component of the project evaluation procedures. This finding is similar to recent findings of the GAO, which reports:

> "Our case studies also demonstrated that officials often place value on a variety of indirect impacts that may be difficult to estimate and are often not quantified in project analyses. For example, we found that many of the projects we examined were expected to result in desirable changes in land use and economic development in the region, although these types of impacts were not quantified or systematically analyzed in the planning documents we reviewed for both highway and transit investments." (GAO, *Highway And Transit Investments,* 2005, pp. 26-27).

The GAO found several barriers that account for why economic analysis, including EIA, is not more widely used in U.S. public sector surface transportation decision-making. The barriers can be grouped into the following major categories: statutory and funding issues; political concerns; technical and data limitations; and cost. More detail about them and potential solutions to correct them is provided in Briefing Paper 4K-05. In general, however, the practice of EIA and other economic analysis methods could be enhanced through educational and training programs directed at public agencies and the development of better data and analytical tools. Additional policy and regulatory incentives may be necessary to induce public agencies formally incorporate economic analysis methods such as EIA into the planning process.

Finally, efforts to raise more money from the public to pay for needed transportation infrastructure may falter unless the efficacy of investments to the public can be demonstrated by greater use of economic analysis. BCA is an important tool for establishing the efficiency of an investment, but its bottom line assessment of the net dollar value of a project's benefits is difficult for many in the public to understand. Good quality EIA, that clearly demonstrates the beneficial economic impacts of the investment in terms of jobs, incomes, and business growth, rather than simply net dollar values, represents an important addition to the BCA results in garnering public support for both public and private investments in our surface transportation infrastructure.

References

David Aschauer, "Is Public Expenditure Productive?" *Journal of Monetary Economics* 23, 1989, pp. 177-200.

Randall W. Eberts, *The Economic Justification of Road Investments: Infrastructure and Development,* Presented at the 14th IRF World Congress, Paris, France June 11, 2001.

Federal Highway Administration, *Economic Analysis Primer*, FHWA IF-03-032, Washington, DC, August 2003.

Government Accountability Office, *Highway And Transit Investments: Options for Improving Information on Projects' Benefits and Costs and Increasing Accountability for Results* (GAO-05-172), Washington, DC, January 2005.

Government Accountability Office, *Surface Transportation: Many Factors Affect Investment Decisions* (GAO-04-744), Washington, DC, June 2004.

Theofanis P. Mamuneas and M. Ishaq Nadiri, Production, Consumption and the Rates of Return to Highway Infrastructure Capital, Federal Highway Administration, Washington, DC, 2003.

M. Ishaq Nadiri and Theofanis P. Mamuneas, *Contribution of Highway Capital to Industry and National Productivity Growth,* Final Report, Federal Highway Administration, Washington, DC, 1996.

M. Ishaq Nadiri and Theofanis P. Mamuneas, "The Effects of Public Infrastructure and R&D Capital on the Cost Structure and Performance of U.S. Manufacturing Industries," *The Review of Economics and Statistics,* Vol. 76, No. 1, 1998.

M. Ishaq Nadiri and Theofanis P. Mamuneas, *Contribution of Highway Capital to Output and Productivity Growth in the U.S. Economy and Industries*, Federal Highway Administration, 1998.

Chad Shirley and Clifford Winston, "Firm Inventory Behavior and the Returns from Highway Infrastructure Investments," *Journal of Urban Economics*, Vol. 55, March 2004, pp. 398-415.

Standing Advisory Committee on Trunk Road Assessment (SACTRA), *Transport and the Economy,* Department of Transport, United Kingdom, 1999.

Transportation Research Board, *Current Practices for Assessing Economic Development Impacts from Transportation Investments*, (NCHRP Synthesis 290), Washington, DC, 2000.

Transportation Research Board, *Estimating the Benefits and Costs of Public Transit Projects: A Guidebook for Practitioners,* (TCRP Report 78), Washington, DC, 2002.

CONSOLIDATED COMMENTS FROM MEMBERS OF THE BLUE RIBBON PANEL OF TRANSPORTATION EXPERTS - PAPER 4K-06

One reviewer commented as follows:

This paper does an excellent job of comparing and contrasting the analytical approaches of Benefit-Cost Analysis (BCA) and Economic Impact Analysis (EIA) in public sector infrastructure investment decisions. Two points need to be mentioned:

1. The paper correctly recognizes that construction and related expenditures are costs, and should be treated as such in both CBA and EIA. However, it does not fully address the dicey problem that arises from the fact that one of the EIA measures – namely, jobs – are quite often derived from feeding such expenditures into regional input-output models. The crucial issue here is whether all, some or none of the jobs generated should be considered a benefit of the project. This brings into the discussion the role of the state of the economy. If there is widespread unemployment in the target area, it seems reasonable to conclude that all jobs should be considered beneficial since otherwise excess resources are put to work on the transportation project. At the other extreme, if the economy is at full employment, then the benefits of jobs generated by the transportation project would seem questionable since they come at the expense of one or more projects not being undertaken due to resource shortage.

2. There is a need to clarify the following statement on page 3: *"The EIA results should neither state nor imply, however, that the monetary value of indirect effects is additional to the net value measured in the BCA. To do so would overstate the economic justification of the project by effectively double counting the project's net benefits."* This statement seems a bit too strong in those cases where there are strong business agglomeration effects, as noted on page 4, and also in those cases in urbanized areas where private and public sector agents deliberately sponsor development around major transportation hubs/projects. (For example, in New Jersey, Fort Lee's development around the George Washington Bridge and Newport/Pavonia development around the PATH station are striking examples of sizable economic impacts that far surpassed direct measures of travel time savings in a BCA analysis.)