Measuring Productivity, Competitiveness and Economic Growth Effects of Transportation Projects: How can they be measured and how can this information be used ?

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ITED Conference, 2014

In recent years, there have been substantial strides in research concerning the ways that transportation investments lead to changes in business productivity and economic growth patterns. This has fueled the development of a series of new tools for evaluating productivity impacts and wider economic effects. The use of such tools can have substantial consequences for transportation decision-making in the future, by changing the way that benefit-cost analysis, economic impact analysis and multi-criteria rating is done. However, there are both data collection costs and overlap measurement risks associated with efforts to broaden the evaluation of economic benefits. This presentation provides a critical review of recent research and practice concerning productivity impacts, to examine the consequences of including broader productivity effects in transportation project prioritization and funding decisions.

In the US, much of the new research relating to productivity has come from a series of studies sponsored by SHRP2 and TRB's Cooperative Research Programs, covering rail, air, transit and highway modes. This presentation summarizes that range of research, focusing particularly on key findings from two recently completed studies: NCHRP 02-24 (Productivity Implications of Transportation Investment) and SHRP C-11 (Tools for Assessing Wider Economic Benefits). Together, the studies provide a framework for considering how investment in facility and service improvements can lead to four different forms of impact on transportation system conditions: (1) direct changes in travel times and costs for users, (2) reliability, (3) market access and (4) intermodal connectivity. The latter three represent "wider transportation impacts" that are not normally covered in traditional transportation benefit assessment.

The four elements of transportation impact, in turn, affect business productivity and economic competitiveness by enabling changes in business operations and supply chain technologies, as well as agglomeration and production scale economies. This includes both "urbanization effects" (such as access to a larger and more specialized base of workers, or access to a broader base of customers) and "localization effects" (such as benefits of inter-firm interactions that enable greater knowledge transfers, or greater supply chain integration).

The development of tools to measure each of these classes of transportation and productivity impact is relatively recent. And they raise many issues, as they highlight the complexity of measuring wider transportation effects and calculating wider economic productivity effects. And it has become clear that current tools cannot fully separate out all of the interaction effects. For instance, a change in intermodal connectivity can lead to changes in reliability that also have consequences for market access. The consequences of these measurement issues are also discussed.

To address the adequacy of tools for assessing productivity and competitiveness impacts – it is useful to adopt a two-step process that (1) decomposes the elements of transportation impact and subsequent economic impact that are inherent in these related concepts, and (2) systematically

identifies the extent to which they are measurable with current tools. Finally, the current use of productivity and competitiveness impact metrics by State DOTs and MPOs is critically reviewed in terms of the relevance and use for decision-making. This finding also provides insight regarding the roles that transportation projects can play in enabling future economic development at the local, regional and national levels.

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