



0-6628: Economic Considerations in Transportation System Development and Operations

Background

While many transportation planners and engineers feel unfamiliar with economic principles, their daily job duties frequently involve economic decisions. While these decision processes may regularly be informal, emerging via engineering judgment or rules of thumb, they are rooted in economic considerations and consequences. The Transportation Economics Reference serves as a comprehensive and concise guidebook for practitioners to appreciate the economic implications of their work and assess such impacts when making transportation investment, policy, and maintenance decisions. In addition to introducing key terms and concepts, the Reference presents a wide variety of evaluation and analysis tools to help transportation professionals address fundamentally complex questions with more confidence, particularly under resource constraints. Ultimately, travel is an expensive, economic activity, and sound economic judgment is vital to transportation planning and engineering.

What the Researchers Did

To best tailor the Reference to the needs of DOT personnel, the researchers first conducted an extensive review of recognized texts on transportation economic theory and applications, NCHRP and TCRP synthesis reports, FHWA primers, and state DOT guidebooks. The researchers also consulted multiple experts in various areas of transportation economics on

nuances and controversies that exist in the literature and in practice.

The team's second stage of content development focused on spotlighting concepts and issues most relevant for TxDOT staff. In this second stage, phone interviews with 10 TxDOT staff and two focus group meetings with 14 additional TxDOT personnel were conducted for direct feedback on topics of potential interest and impact. This effort helped identify ideas of greatest interest to the intended audience and incorporate agency-specific examples and case studies, helping increase the Reference's readability. Such direct outreach to TxDOT staff also helped identify a reader-friendly format for the Reference, highlighting key terms and concepts at the beginning of each chapter and locating more detailed discussions in "In-Depth Look" sections at the end of each chapter.

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What They Found

The Reference totals over 300 reader-friendly pages and covers virtually all relevant topics. It begins with a discussion and listing of the costs and benefits of transportation, and moves into ideas behind pricing transportation services, regulation and competition, transportation and land use interactions, investment and financing, project evaluation, economic impact analysis, and statistical methods for analyzing economically relevant data. The Reference's Introduction and Overview motivates the chapters that follow, by quickly dispelling the myth that engineers do not use economics and by describing many common transportation questions that involve economic principles. The Introduction and Overview also provides chapter summaries, highlighting key concepts as well as related transportation considerations. Time-constrained readers can get a strong sense of the Reference simply by reading its nine-page introduction.

At the end of the Reference, Data Sets and Case Studies chapters identify data resources and describe real-world transportation applications of economic methods and tools discussed in prior chapters. A wide variety of public and private data sets are listed, along with their potential transportation applications. Four case studies illustrate how economic concepts introduced in the Reference can be integrated to enhance TxDOT planning, investments, and policy making, while highlighting the value of statistical analysis. The Reference's case studies demonstrate the flexibility of econometric models in mining Census, land use, and other

public data sets to quantify relationships between variables of interest. Such relationships are essential in anticipating transportation project and policy impacts, even in the presence of uncertainty.

A three-part training workshop was also developed under this research project, to explain core Reference concepts to TxDOT staff. The presentation files used during these workshops include presenter's notes, enabling TxDOT to conduct future in-house workshops and webinars for those looking for a more interactive introduction to the Reference.

What This Means

Armed with a wide variety of economic analysis and evaluation tools, agency staff can go beyond casual rules of thumb and employ formally documented processes for economic decision making. Addressing issues ranging from appropriate contractor fines for construction delays to optimal budget allocation across capacity-expansion and maintenance projects, the Reference on Transportation Economics speaks directly to the day-to-day needs of practitioners. For large projects with significant costs closely scrutinized by members of the public and other stakeholders, TxDOT personnel can feel more confident in their decision making with a basic understanding of the economic principles that permit prediction of project impacts. The Reference's transportation economics fundamentals, analysis methods, and case studies illustrate the endless opportunities for economic considerations within transportation.

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