

Scenario Planning for Strategic Regional Transportation Planning

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Abstract: This paper proposes a framework for using business and organizational scenario-planning techniques for regional strategic transportation-planning purposes. The paper provides a brief history of scenario planning as it emerged from business-strategic planning activities and gives an overview of its goals and limitations. The paper then reviews the context for scenario planning in regional transportation planning as well as precedents of its application in this field. The paper continues with a presentation of a scenario-planning framework for transportation as refined and applied to the Houston metropolitan area. The major findings and lessons from this application are discussed, together with conclusions and observations regarding further potentials and refinements.

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Introduction

Scenarios are not new to planning. Indeed, the use of the term scenario is quite common across a range of planning disciplines, from business-strategic planning to urban-transportation planning. For example, in travel-demand forecasting, it is common to develop scenarios of land uses that have a certain probability of developing in the future. Transportation projects can then be evaluated in the context of these different land-use scenarios. Similarly, different scenarios of economic growth, or fuel-efficiency improvements, or price changes are often used to develop ranges of future possibilities (i.e., the high-growth scenario and the low-efficiency scenario). In these cases, scenarios are simply alternative point estimates of potential futures.

In scenario planning, however, the term scenario adheres more closely to its literal definition of an imagined sequence of future events. Using what are sometimes called decision scenarios (Wack 1985b), scenario planning is a tool designed to help an organization judge how effective decisions made today will be in the uncertain future. Scenario planning is not a replacement for traditional planning techniques such as forecasting; instead it aims to help organizations better prepare for the unexpected. In short, scenario planning helps to make robust strategic choices.

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It is in this broader meaning of the concept of scenarios that we propose a framework for applying scenario planning to regional strategic transportation planning. Building on the recent rich history of scenario-planning applications in a variety of contexts, this paper describes an application of the process by a group at the Massachusetts Institute of Technology (MIT) to a specific regional transportation setting (Houston). The specific outputs of the 9-month Houston application are described in CMP-ReS/SITE (1999). The Houston application is intended to serve as a demonstration of how scenario planning can be applied in strategic regional transportation planning. The Houston case serves as one step in a broader effort toward exploring the potential value of scenario planning for practical transportation- and urban-planning needs.

This paper has three primary purposes. First, by situating scenario planning within the broader regional transportation-planning process and its relevant tools, the paper attempts to show the reader where and how scenario planning might make a contribution. Second, by documenting the methodology as applied to the Houston case, the paper intends to offer a specific step-by-step framework which practitioners might use in combination with their traditional regional transportation-planning process. The framework offers a structured, logical process—to enable consistency and deeper understanding—for depicting how the future we are planning for might evolve. Finally, by evaluating the approach used in the Houston case, the paper attempts to offer insights from the process, discussing links to other existing methodologies and suggesting extensions to the work. The ultimate goal of this work is to advance the development of an effective framework for improving strategic regional transportation planning in a world of uncertainty.

Primer on Scenario Planning

Short History

Scenario planning as an approach to strategic planning is usually attributed to Royal Dutch Shell and its business planning group. According to Pierre Wack (1985b), a member of the team that pioneered the approach, Royal Dutch Shell first began applying