DEVELOPMENT OF MULTIPLE GROWTH STRATEGIES FOR USE IN DEVELOPING TRAFFIC FORECASTS: A ROBUSTNESS APPROACH

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RESEARCH

Introduction

Transportation system improvement decisions based on misleading forecasts may lead to a misallocation of funds and to projects that under-perform in construction and operation. Poor projections of demographic and socioeconomic data are usually cited as the main source of poor traffic assignment projections and hence, unfavorably conceived planning and construction of streets and highways. Robustness analysis of transportation systems supports decision-making in these high-uncertainty conditions through exploiting flexibility in phased transportation planning.

Project Objective

The risk of poorly-planned roadway systems may be reduced through increasing the flexibility and minimizing the uncertainties of the planning process. This project used historical planning documents and transportation planning software to develop "future" street networks, which were compared to the street network as it actually existed in the project horizon year. Robustness analysis techniques were used to develop a procedure to make the urban transportation planning process more flexible and to minimize the uncertainties inherent in travel demand models. These procedures were translated into guidelines for improving the transportation planning process.

Project Description

This report evaluated the accuracy of long range projections by comparing the projected transportation demand from a transportation study done in the 1970s for Topeka, Kansas, with the actual transportation demand in the horizon year of the study. Projected traffic counts from the study and actual traffic counts in the horizon year were also compared. Ten development plan scenarios combining various traffic networks and projections of land use, socioeconomic and demographic changes were developed. A robustness analysis that assigned a robustness score to individual highway sections was used to evaluate the priority of highway improvement projects.

Project Results

Traffic demand models use the forecast socioeconomic and demographic values in the calculation of projected traffic volumes. The socioeconomic and demographic forecasts used in the transportation study were found to correlate poorly with the measured data in the horizon year, and the forecast traffic volumes were correspondingly inaccurate when compared with actual traffic counts. Despite these forecasting inaccuracies, 98% of the major streets had the number of lanes prescribed for their level of service according to the 1994 Highway Capacity Manual (HCM).

The robustness analysis showed that the highway links currently carrying high traffic volumes in Topeka received high robustness scores as based on the 20-year-old projections. Thus, robustness analysis could be used to identify high-priority projects, even if the assumptions used to create the scenarios are not borne out.

Report Information

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