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Texas
Department of Transportation
In cooperation with the
Federal Highway Administration
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**Research Summary
Report**

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ECONOMIC DEVELOPMENT IMPACTS OF EXPENDITURES FOR STATE HIGHWAY IMPROVEMENTS IN TEXAS

PROBLEM STATEMENT

In recent years, the Texas Department of Transportation (TxDOT) has begun to expand its mission to include the use of highway improvements which encourage Texas' economic growth and development. Highway improvements, either in the form of a new highway or the upgrading of an existing one, can generate functional changes in the regional economy. It is important to identify, therefore, locations where highway improvements are likely to be most beneficial, what groups realize the gains, and what groups bear the costs.

At the present time, TxDOT is developing a State Highway Trunk System but does not currently have procedures to systematically assess the traffic and economic development impacts of proposed intercity highways. As a result, requests for intercity route studies are addressed on a case-by-case basis. Anticipating the timing and scope of these requests and incorporating them into the state's transportation planning and programming process is difficult. Evaluation procedures and/or policies for highway route studies requests need to be developed within the department's statewide transportation planning process.

Transportation planners and engineers have at their disposal a number of "standard" procedures (e.g., benefit-cost analysis) to measure the relative cost-effectiveness of alternative transportation improvements. In addition, there are several methodologies which can be used to examine the relationships between transportation and economics at the regional level. While adequate, widely accepted procedures for quantifying the economic development potentials of transportation improvements within individual travel corridors, such as benefit-cost analyses, typically do not address the complete spectrum of social and economic impacts of highway improvements.

OBJECTIVES

The Texas Transportation Institute (TTI) conducted study 1228, *Role of SDHPT in Statewide Economic Development*, for the Texas Department of Transportation (TxDOT) and the Federal Highway Administration (FHWA) with the final report focusing on the relationships between a state's transportation expenditures for intercity highways and economic development. The overall goal of this research effort was to develop procedures and or guidelines to assess the regional economic impacts of intercity highways. Specific study objectives were:

- Review procedures used by other states to identify, prioritize, and select intercity highway improvements that are intended to foster economic development.
- Identify current analytical techniques for assessing the economic development impacts of expenditures on intercity highways.
- Develop the data bases needed to calibrate and implement these procedures for use in selected travel corridors in Texas.
- Develop guidelines for use in assessing the economic development impacts of expenditures on intercity highways in Texas.
- Develop procedures for incorporating these guidelines into the state's existing planning and decision-making process.

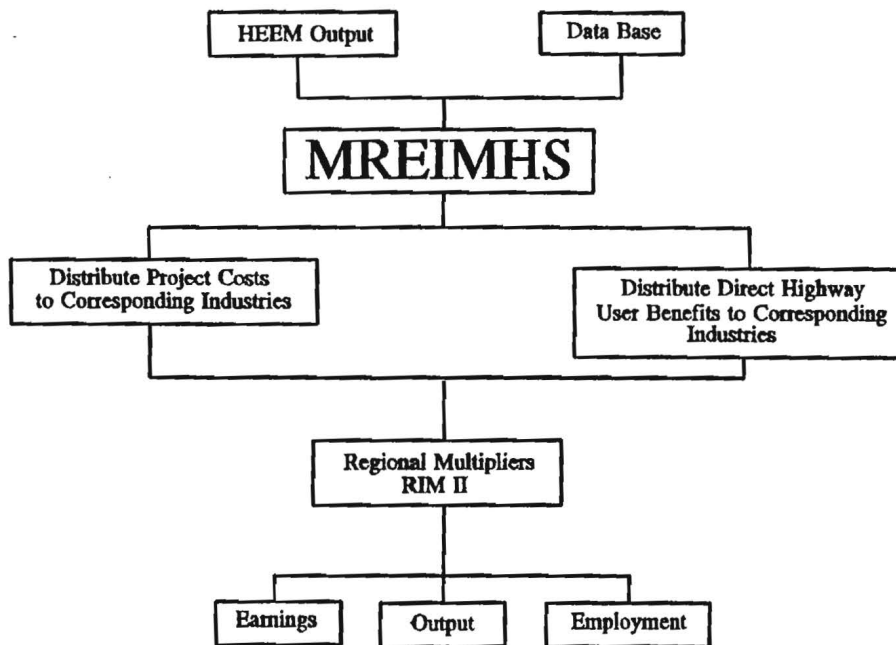


Figure 1: General Structure of the Modified REIMHS Model

FINDINGS

The preliminary analysis quantifying the relationships between expenditures for transportation improvements and economic development in Texas was performed using the Regional Economic Impact Model for Highway Systems (REIMHS). This program allows for a more comprehensive assessment of the economic impacts of highway investment programs than other economic evaluation models.

The REIMHS model evaluates operating efficiency savings, mobility savings, and safety savings related to highway improvements. Additionally, REIMHS assesses the regional economic impacts of highway investments, particularly the estimated monetary value of all goods and services produced by the regional industries involved in the highway improvement project. It also assesses the estimated monetary value resulting from the employment of workers in the regional industries involved in the highway improvement projects.

In addition to the REIMHS model, a Modified Regional Economic Impact Model for Highway Systems (MREIMHS) has been designed to evaluate proposed highway improvement projects in terms of their contributions to the regional economy. The general

structure of MREIMHS is shown in figure 1. The model uses the output from an existing computerized cost-benefit model (Highway Economic Evaluation Model—HEEM), which TxDOT currently uses to rank proposed highway improvements. It also inputs annual project cost data obtained from the journal *Highway Statistics* and the direct user benefits from the HEEM model to estimate the regional economic impacts of proposed highway investments. The results of the MREIMHS model can be used to calculate a benefit-cost ratio which can then be used to rank proposed highway projects.

A preliminary test application of the MREIMHS model was carried out on the Pinehurst corridor situated northwest of the greater Houston area between U.S. Highway 290 and Interstate Highway 45. Focusing specifically on the feasibility of a new roadway in the corridor, TxDOT evaluated the following highway improvement alternatives:

- 1) Build a four-lane freeway along the proposed new alignment with the necessary right-of-way acquired in accordance with TxDOT policies.
- 2) Build a four-lane freeway along the proposed new alignment with partial do-

nation of the necessary right-of-way.

- 3) Upgrade existing roadways in the corridor to four-lane freeways.

The results of the preliminary analysis in the Pinehurst corridor indicate that each of the highway investment alternatives would stimulate approximately \$200 million of total regional output, approximately \$60 million in total earning, and create over 3,000 jobs. Alternative 2 seems to be the most effective improvement, with a benefit-cost ratio of 1.84. This means each \$1 spent yields \$1.84 worth of total regional output and user benefits one year after the completion of the project. Also, the MREIMHS model estimates that approximately 19 jobs would be created per one million dollars invested in the Pinehurst corridor highway project.

CONCLUSIONS

Although the results of the preliminary test application of the modified REIMHS (MREIMHS) model are encouraging, additional testing and refinement of the model is warranted. Following the successful testing of the MREIMHS model in other Texas highway corridors, the program should be made available to Department personnel along with appropriate training in the application of the MREIMHS model.

—Prepared by Casey Bunch, Research Associate, Texas Transportation Institute.

The information described in this summary is reported in detail in TTI Research Report 1228-2F, "Economic Development Impacts of Expenditures for State Highway Improvements in Texas: Preliminary Findings," R.W. Stokes, N. Pinnoi, E. J. Washington, August 1991. The contents of the summary do not necessarily reflect the official views of the FHWA or TxDOT.