

Summary Report 925-2S
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EVALUATING THE PERFORMANCE OF FREEWAY HOV FACILITIES IN NORTH AMERICA

DEPARTMENTAL INFORMATION EXCHANGE

PROBLEM STATEMENT

Research reveals the programmed implementation of some 30 new high-occupancy vehicle (HOV) facilities in North American urban areas by the year 2000. These new projects, combined with planned extensions to existing facilities, could bring the total number of operating freeway HOV projects to 70—approximately 875 miles of HOV lanes by the year 2000.

Evaluating the impact of these HOV facilities has been of interest and concern to transportation professionals in recent years. Although they generally agree that HOV facilities should be evaluated, no consensus exists regarding appropriate evaluation measures, the performance needed for an effective facility, or the data collection techniques. To date, the evaluations that have been conducted have often focused on general evaluation criteria, and, given the nature of many of the facilities and limited funding for data collection, before-and-after evaluations have often been limited.

Yet, evaluations are necessary to ensure that the improvements are providing the desired benefits, and that the expenditure of public funds is justified. Interest in these results comes from not only the transportation community, but also from decision makers, special interest groups, and the general public. The challenge to transportation professionals, then, is to provide an accurate and objective HOV facility evaluation that focuses on key criteria and is easily understood by all groups.

OBJECTIVES

The Texas Transportation Institute (TTI) conducted study 925, *Suggested Procedures for Evaluating the Effectiveness of HOV Facilities*, in cooperation with the Texas Department of Transportation (TxDOT) and the Federal Transit Administration (FTA) to assess high-occupancy vehicle (HOV) lane projects located either on freeways or in separate rights-of-way in Texas and across the U.S.

Researchers examined evaluation studies of HOV facilities in Washington D.C./Northern Virginia, Los Angeles, Houston, Seattle, Minneapolis, Orange County, Santa Clara County, and Fort Lee, New Jersey. Based on this review, they present an approach for designing and conducting evaluations of freeway HOV facilities. The report includes a discussion of:

- overall steps in evaluation process,
- suggested objectives,
- measures of effectiveness,
- threshold ranges, and
- data needs.

Also presented is a more detailed discussion of the specific data collection techniques and methodologies needed to conduct an effective evaluation.

In cooperation with the
Federal Transit Administration
U.S. Department of Transportation



Texas
Department of Transportation

Research Summary Report

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FINDINGS

Following discussion of the literature on before-and-after evaluations of different HOV facilities across the U.S., researchers developed a set of approaches and procedures for designing and conducting an ideal before-and-after evaluation of freeway HOV facilities.

Overall Approach

To ensure that a comprehensive, well-designed evaluation program is pursued, evaluators should consider each of these steps:

- 1) Clear articulation of project goals;
- 2) Identification of measures of effectiveness;
- 3) Identification of information needs;
- 4) Development of the study design;
- 5) Collection of "before" data;
- 6) Collection and evaluation of "after" data;
- 7) Ongoing monitoring and evaluation.

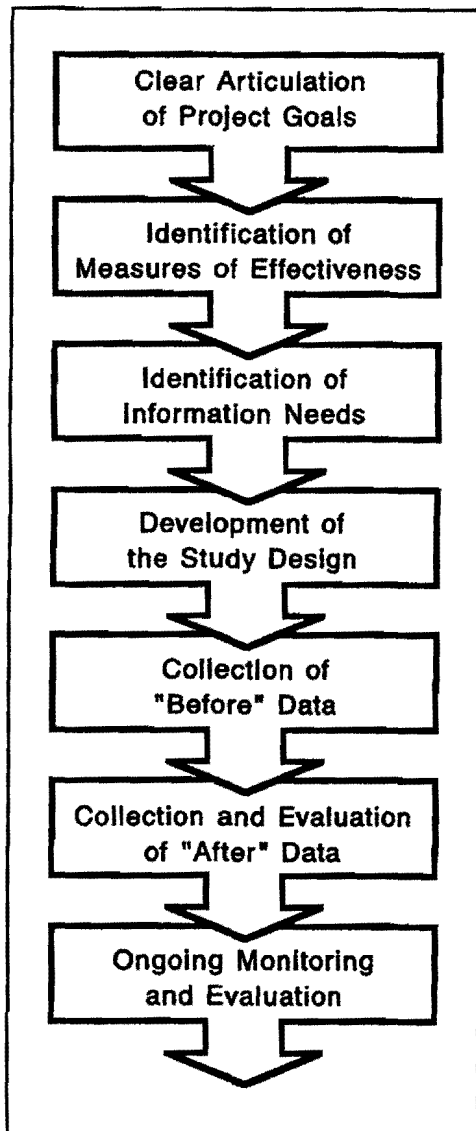
The next area of importance in a state-of-the-art evaluation is a clearly defined and expanded list of objectives that reflect the reasons for developing the HOV facility. The report illustrates how identifying these objectives leads to the appropriate measures of effectiveness, the general threshold ranges, and the data needs for a successful and accurate evaluation. The following, taken from the report, is an example of how this process works with one objective:

Objective: The HOV facility should increase the per lane efficiency of the total freeway facility.

Measures of Effectiveness: This objective can be measured by a comparison of the peak-hour per lane efficiency of the freeway lanes prior to implementation of the HOV project and combined peak-hour per lane efficiency of the freeway lanes and HOV facility after implementation. The "before" measure can be calculated by taking the person volume on the freeway multiplied by the average freeway operating speed. The "after" measure can be calculated by taking person volume on the freeway multiplied by the average freeway operating speed combined with the person volume on the HOV facility and multiplied by the average HOV lane operating speed.

General Threshold Ranges: A 5 to 20% increase in the peak-hour per lane efficiency of the total facility could be expected from an HOV project.

Data Needs: The information obtained



from the freeway and HOV lane(s) vehicle and occupancy count and travel-time runs taken before and after implementation of the HOV facility are used to calculate the per lane efficiency.

Suggested Data Collection Techniques

This study addresses the need for detailed and accurate data collection. Utilizing the procedures currently employed to evaluate the Houston HOV lanes as a model, as well as examples from other U.S. areas, researchers identified a set of suggested procedures and techniques for conducting each of the major data collection activities. These include vehicle and occupancy counts, travel time runs, user

and non-user surveys, safety and accident information, and violation rates, all of which are conducted on a regular basis in Houston.

This chapter also suggests possible data reduction and analysis techniques and outlines the general resources needed to conduct these activities. Last is a discussion of some of the major issues associated with data collection activities, such as frequency, scheduling and resources, training, statistical validity of sampling techniques, the use of cameras and other advanced technologies, the standardization of terms, and the identification of a priority listing of data collection efforts.

CONCLUSIONS

While examples of good HOV evaluation studies do exist, there are also many cases where little or no data collection or evaluation has occurred. This often results in insufficient data to make meaningful before-and-after comparisons on the impact of HOV projects. In addition, the lack of uniformity between approaches has made comparisons between projects difficult. The study will provide a model for application with all types of freeway HOV projects. These procedures should enhance individual project evaluations and provide for greater comparability between projects.

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The information described in this summary is reported in detail in TTI Research Report 925-2, "Suggested Procedures for Evaluating the Effectiveness of Freeway High-Occupancy Vehicle (HOV) Facilities," Katherine F. Turnbull, Russell H. Henk, Dennis L. Christiansen, February 1991. The contents of this summary do not necessarily reflect the official views of the FTA or TxDOT.

