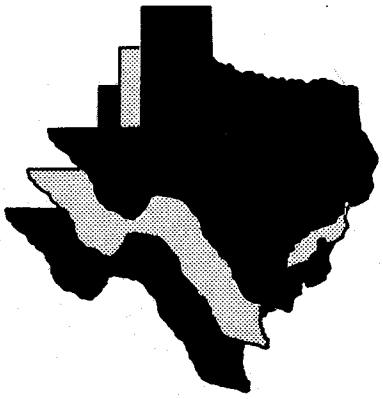

DEPARTMENTAL INFORMATION EXCHANGE

Summary Report 1146-6S
September 1994

HIGH-OCCUPANCY VEHICLE LANES IN TEXAS

PROBLEM STATEMENT

Houston has passed the half-way mark of developing 95.5 miles of barrier-separated high-occupany vehicle (HOV) lanes, and Dallas recently opened the first sections of a planned 37 mile HOV system. Even with a total of five operating HOV lanes in Texas, freeway travel demands continue to increase; and as urban areas continue implementing HOV lanes as a solution to the problem, they must know whether the lanes are meeting key objectives—most importantly, whether HOVs are increasing the person-movement capacity of the freeways.

OBJECTIVES

The Texas Transportation Institute (TTI) conducted study 0-1146, *A "Before" and "After" Evaluation of the Committed High-Occupancy Vehicle Transitway Projects*, in cooperation with the Texas Department of Transportation (TxDOT) and the Federal Highway Administration (FHWA) to collect, analyze, and interpret data that reveals the performance of the five operating HOV lanes in Texas. With the final report focusing on data taken through calendar year 1992, specific HOV objectives addressed were:

- impacts on bus operations,
- impacts on freeway general-purpose lane operations,
- air quality and energy considerations,
- project cost-effectiveness, and
- public support for HOV programs.

Researchers used two principal evaluation approaches. First, "before" and "after" trend line data were collected for each freeway where an HOV lane is being developed. Second, this data was compared to similar data collected in corridors that do not have HOV lanes. These procedures helped to identify and isolate the impacts of the HOV lanes.

FINDINGS

The research showed that three factors significantly impact how much an HOV lane is used: 1) the length of time the priority lane has been operating; 2) the vehicle groups allowed to use the HOV lane; and 3) the travel time savings and trip time reliability provided by the HOV lane. This third factor is, perhaps, the single most important factor influencing transitway use. The data suggest that unless the HOV lane offers (on a recurring basis) a peak-hour travel time savings of at least five minutes when compared to the general-purpose lanes, use of

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The 1992 data shows almost complete agreement that the following HOV objectives have been met.

- ▲ Increase person movement
- ▲ Don't unduly impact freeway general–purpose lane operations
- ▲ Increase the overall efficiency of the roadway
- ▲ Impact air quality and energy favorably
- ▲ Enhance bus operations
- ▲ Are cost–effective
- ▲ Have public support

Figure 1: Objectives of a High-Occupancy Vehicle Lane

the priority facility will be marginal. Figure 1 reveals the seven key objectives which served as the measures of effectiveness in this study. The following points highlight the important findings for each objective:

• The data show that HOV lanes are helping to bring about a large increase in person movement. During peak hours, the HOV lanes are moving 96% (Gulf) to 228% (Katy) more persons per lane than are the freeway general-purpose lanes.

• Although the HOV facilities move several thousand persons per hour, there has been virtually no adverse impact on the operation of the freeway general purpose lanes that can be attributed to implementation of the HOV lanes. In fact, per-lane volumes on the general-purpose lanes are often higher after HOV implementation. Nor have accident rates changed for the five freeways with HOV lanes.

• Using the peak-hour per lane efficiency as the multiple of peak-hour person volume times the speed at which that volume is moving, overall freeway efficiency has generally increased where HOV lanes have been implemented.

• The HOV alternative, compared to the add a general-purpose lane alternative, resulted in a 16 percent reduction in fuel consumed and a 31 percent reduction in carbon monoxide emissions.

• The HOV lanes have generated a large increase in transit use and have attracted a new type of transit rider—the young, educated, white-collar Texan. In comparing pre-HOV conditions to the present, average bus operating speeds during the peak hour have nearly doubled, increasing from 26 mph to 49 mph. The result has been significant decreases in bus schedule times.

• In considering only one benefit—the value of time saved by users of the HOV—analyses reveal that the Katy and East RLT HOV lanes are clearly cost-effective, while the Gulf, North, and Northwest HOVs are marginally cost-effective. However, if additional benefits are considered, the benefit-cost ratio increases markedly.

• Public acceptance of HOV lanes in Texas is high and continues to increase over time. 1990 surveys of non-HOV users showed that over 70% felt HOVs are a good transportation improvement.

IMPLEMENTATION

To continue successful planning, construction, and implementation of freeway HOV lanes, agencies must have a clear idea of what makes a system successful (objectives) and exactly to what extent current projects have been able to meet those objectives. The data from this project, taken over a five year period through 1992, provide TxDOT and metropolitan transit authorities with quantitative values for each objective that can be used as a guide for monitoring and developing HOV systems.

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The contents of this summary are reported in detail in TTI Research Report 1146-6F, "An Evaluation of High-Occupancy Vehicle Lanes in Texas," by Russell H. Henk, Daniel E. Morris, and Dennis L. Christiansen. This summary does not necessarily reflect the official views of TxDOT or the FHWA.