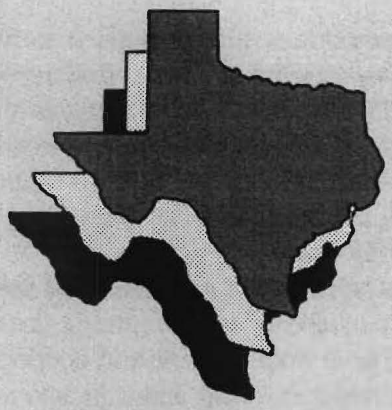

DEPARTMENTAL INFORMATION EXCHANGE

Summary Report 1225S

July 1993

PLANNING, DESIGNING, AND OPERATING BUS-RELATED STREET IMPROVEMENTS AND SERVICES

PROBLEM STATEMENT

The Texas Department of Transportation (TxDOT) has responded to the need for a balanced transportation system by expanding beyond its traditional highway orientation to a role that now places increased emphasis on public transportation systems. As a result of the increased level of support for transit and the new multimodal approach to public transportation planning in Texas, there is a growing need to develop guidelines and incorporate provisions for transit vehicles and services into the department's roadway planning, design, and operation processes.

OBJECTIVES

The Texas Transportation Institute (TTI) conducted study 1225, *Preparation of a Texas Manual For Planning, Design, and Operation of Streets and Highways with Public Transportation Systems*, in cooperation with The Texas Department of Transportation (TxDOT) and the Federal Highway Administration (FHWA) to develop informative guidelines on incorporating bus service considerations into the street planning, design, and operation processes. The first report, 1225-1, presented findings from a nationwide survey of transit/transportation agencies concerning current practice in planning, designing, and operating transit-related street improvements. The report discussed various factors considered in developing bus guidelines, as well as summarized the physical and operating characteristics of light rail transit (LRT) vehicles and services that are pertinent to the design of transit-related street improvements. Using the survey results, the second part of study 1225 developed and refined guidelines for planning, designing, and operating bus-related street improvements. Specifically, this second report (1225-2F) is intended to facilitate the development of a cooperative bus service planning process in Texas by presenting guidelines for:

- Bus Service Planning,
- Bus Facility Design, and
- Bus Service Operations.

FINDINGS

Bus Service Planning

These guidelines focus on bus route and service planning considerations and on locating bus service support facilities. Most transit agencies have developed guidelines and policies to assess whether a transit market exists and whether that market can be served by existing or proposed transit services. In planning new or improved services, transit agencies primarily consider population densities, trip generation potentials (i.e. land uses), and characteristics of the street network. This section of the report (1225-2F) presents a brief overview of these

TEXAS TRANSPORTATION INSTITUTE

Texas Department of Transportation

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

Research Summary Report

D-10 Research • P.O. Box 5051

Austin, Texas • 78763-5051

basic service planning factors for buses, so that transportation agencies can identify roadway segments and travel corridors where street designs should include provisions for buses and bus service support facilities.

While the basic factors outlined in this chapter are commonly used by transit agencies in planning transit services, specific factors and threshold values may vary from city to city. Therefore, departments should consult local transit agencies concerning specific local service planning guidelines. Topics discussed include:

- Bus Service and Route Planning,
- Bus Stops and Turnouts,
- Waiting Areas and Shelters, and
- Pedestrian Access.

Bus Facility Design

Guidelines for the design of transit-related street improvements consider geometric and structural issues. These issues are considered in the design of roadways and support facilities to provide safe and efficient bus operations on surface streets. Topics in this section of the report include:

- Vehicle Characteristics,
- Clearances, Lane Widths, and Grades,
- Intersection Design,
- Pavement Design,
- Bus Stops, Turnouts, and Turnarounds, and
- Shelter Area Design.

Bus Service Operations

This section summarizes the effects of buses on roadway capacity and outlines guidelines and strategies for increasing the efficiency of bus operations on surface streets. The following topics and key points are elaborated in the chapter:

Capacity. The percentage of buses (and other heavy vehicles) in the traffic stream is an important factor in how a road operates. Yet the reductive effect of buses on vehicular capacity varies according to the method of operation. The flow rate should be adjusted accordingly.

Bus Priority Measures. These strategies include reserved bus lanes and priority treatment for buses at traffic signals. The planning and implementation of these bus priority treatments requires a high concentration of bus services, high levels of traffic congestion, and community support for transit services.

Signs and Pavement Markings. Proper signs at transit facilities are an important element of good transit service. Signs serve as a source of information to the patrons and operators by showing the location of bus stops, park-and-ride lots, and other facilities. They are also an excellent marketing tool to promote transit use.

Traffic Signals. Generally bus stops are located at signalized intersections of two major streets. This provides the potential for transfers of passengers between buses or for larger accumulations of passengers. Traffic signal design should accommodate buses and bus passengers.

Maintenance. Maintenance for bus-related street improvements generally consists of the following:

- Maintenance of pavement surfaces,
- Repainting stop areas,
- Snow removal/sanding of roadway and bus turnouts, and
- Cleaning, repair, and replacement of parking control and bus stop signs.

CONCLUSIONS

These guidelines may need to be modified to reflect local conditions and practices. The metropolitan transit authorities that responded to the survey discussed in the first report (1225-1) were quick to note that the guidelines are intended to provide *guidance* in developing transit facility designs, rather than to specify engineering designs.

The results of study 1225, as seen in both reports, indicate the need for improved coordination and cooperation between transit and state and local highway agencies. The results of another recent TTI study, "Transit Study Needs in Texas" (2004-1F), cosponsored by TxDOT and the Federal Transit Administration, support this hypothesis. Based on these considerations, it may be appropriate to conduct a new study to include an examination of mechanisms for fostering more effective interagency cooperation and coordination.

—Prepared by Kelly West, Science and Technology Writer, Texas Transportation Institute.

The information described in this summary is reported in detail in TTI Research Report 1225-1, "Guidelines For Planning, Designing, and Operating Transit-Related Street Improvements: Survey of Current Practices," Robert W. Stokes, Paul Luedtke, and Thomas Urbanik II, September 1989, and TTI Research Report 1225-2, "Guidelines for Planning, Designing, and Operating Bus-Related Street Improvements," Kay Fitzpatrick, Thomas Urbanik II, and Robert W. Stokes, August 1990. The contents of the summary do not necessarily reflect the official views or policies of the FHWA or TxDOT.