GUIDE FOR
HIGH-OCCUPANCY VEHICLE (HOV) FACILITIES

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Prepared by the
Technical Committee on Public Transportation Facilities Design
AASHTO Subcommittee on Design

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AASHTO's Technical Committee on Public Transportation Facilities Design is indebted to the many contributions to this guide. The foundational bases of the guide were the *NCHRP Report 414, HOV Systems Manual* and the previous edition of the *AASHTO Guide for the Design of High-Occupancy Vehicle Facilities*. Technical Committee members were assigned to the sections of this guide, and they provided the first draft of the sections by including recent developments and experience in the planning, operation, and design of HOV facilities. The additional background research and editing was accomplished by William Eisele, Ginger Daniels Goodin, and Michael Martello of the Texas Transportation Institute, with Ivan Lorenz developing and editing graphics and Pam Rowe performing the word processing. The Technical Committee also wishes to thank the many individuals who provided comments and feedback during the peer-review process.

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Introduction

Limited right-of-way and economic realities often dictate that public investments be concentrated toward increasing the efficiency of and preserving the existing transportation infrastructure rather than expanding the existing transportation infrastructure. At the same time, it is likely that growth of metropolitan areas will continue. A major consequence of these trends will be an increasing inability of the existing transportation system to meet future demand. Therefore, alternative measures must be taken to prioritize use, such as moving more people in fewer vehicles.

Various transportation systems management (TSM) tools are available to help achieve increased traffic efficiency on existing transportation systems. Typical examples of TSM tools are: traffic operations improvements at intersections, operational improvements on freeways, improved signalization, and street system controls (one-way streets or reversible lanes).

This guide suggests methods and designs for dedicated facilities to encourage greater use of existing transportation systems, such as increased use of public transit (primarily buses), carpools, vanpools, or other ridesharing modes to help attain the above goals. Guidance is given for planning and design of preferential treatment for high-occupancy vehicles (HOVs). Portions of this guide have been excerpted from the previous edition of this guide, which this new guide replaces *(3)*, the National Cooperative Highway Research Program (NCHRP) *HOV Systems Manual (56)*, and recent research from Texas *(18)*.

This guide has been developed to help achieve the following goals of HOV facilities:

- To provide travel-time savings and travel-time reliability for HOVs;
- To maximize the person-moving capacity of roadway facilities by providing improved operating level of service for HOVs, both public and private; and
- To conserve fuel, improve air quality, and minimize consumption of other resources needed for transportation.

HOV lanes may be provided on freeways and other roadways for the exclusive use of buses and other HOVs so they can bypass peak-period congestion on the general-purpose lanes. Increases in ridesharing can be gained from this option when the time savings are significant. The guide discusses a number of options for the establishment of HOV accommodations.

HOV facilities are usually incorporated into existing highway rights-of-way where width and lateral clearances may be limited. While experience has shown that some variance in design is possible without serious adverse effects on safety and performance, the experiences have not been extensive enough to firmly establish new standards specifically for these types of facilities. Therefore, the values presented in this guide should not be regarded as absolute, but rather as the best guidance available based on experience to date.

OVERVIEW OF GUIDE

This guide is intended as just that—a guide. Where this guide does not provide specific geometric information, please refer to *A Policy on Geometric Design of Highways and Streets (5)* for guidance. In some chapters, this guide provides desirable and minimum cross sections and design criteria. Prior to implementing designs that are less than the minimums, an engineering review should be completed with respect to the safety and operational impacts of these geometric elements and their justification. For minimum designs, the designer should review Section 2.1, which describes the link between design, operations, and enforcement of HOV facilities to better understand the conditions under which the minimum designs might

be appropriate and what operational treatments might be necessary. The Federal Highway Administration (FHWA), Federal Transit Administration (FTA), state Department of Transportation (DOT), transit agency, city, and others should agree on the most appropriate cross-section and other geometric design elements. A formal design exception request may need to be processed to document the decisions and their approvals.

The guide also has a glossary to acquaint the reader with certain expressions and terminology that are used in this guide. The five chapters in the guide are described below.

Chapter 1—Planning for Freeway and Arterial HOV Facilities

For an HOV facility to be successful, a number of early assessments and commitments must be made. Chapter 1 identifies those initial considerations that are critical to assuring an efficient and effective HOV operation.

Chapter 1 also describes HOV lane planning issues. The planning section includes an overview of the process, planning for facilities on freeways and arterials, public involvement, and planning for implementation and evaluation.

Chapter 2—Operating and Enforcing HOV Facilities on Freeways

Chapter 2 of the guide describes operational and enforcement considerations for implementation of a successful freeway HOV facility. The operational issues that are described include consideration of the design during decision-making regarding operations and enforcement, selection of eligible vehicles, hours of operation, incident management, and pricing issues.

Chapter 3—Design of HOV Facilities on Freeways

Chapter 3 includes the various types of HOV facilities that may be used in conjunction with freeway sections. These facilities include HOV facilities in separate rights-of-way, barrier-separated facilities (reversible or two-way), concurrent flow lanes, and contraflow lanes. HOV queue bypass lanes for HOVs are discussed, as well as online transit stations. A separate section on signing and pavement markings is provided. Design considerations such as example cross sections and schematics are provided for each facility type. A general section at the beginning of Chapter 3 describes various design features applicable to many HOV facility types.

Chapter 4—Operating and Enforcing HOV Facilities on Arterial Streets

Chapter 4 provides information related to the operation and enforcement of HOV facilities on arterial streets. This chapter describes topics such as conceptual alternatives for arterial HOV facilities, vehicle eligibility, operating hours, enforcement, and intersection control, driveway access, and curb-use considerations.

Chapter 5—Design of HOV Facilities on Arterial Streets

The material presented in Chapter 5 is intended to serve as a guide for the design of HOV facilities on arterial streets. This guidance includes geometric design and also traffic-control aspects for arterial HOV facilities.