



U.S. Department of Transportation
Federal Highway Administration



*Federal-Aid Highway Program Guidance on
High Occupancy Vehicle (HOV) Lanes
August 2008*

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Glossary of Terms

Alternate fuel vehicle – A vehicle that is operating on (1) methanol, denatured ethanol, or other alcohol; (2) a mixture containing at least 85 percent of methanol, denatured ethanol, and other alcohols by volume with gasoline or other fuel; (3) natural gas; (4) liquefied petroleum gas; (5) hydrogen; (6) coal derived liquid fuels; (7) fuels (except alcohol) derived from solar energy; or (8) any other fuel that the Secretary prescribes by regulation that is not substantially petroleum and that would yield substantial energy security and environmental benefits, including fuels regulated under 10 CFR 490.

High Occupancy Vehicle (HOV) – A motor vehicle, carrying at least two or more persons, including carpools, vanpools, and buses.

HOT lane - "High Occupancy/Toll" lane means any HOV lane that allows vehicles not meeting minimum occupancy requirement to use the lane by paying a toll.

HOV facility - Any kind of facility that gives priority treatment to buses, vanpools, carpools and high-occupancy vehicles, including HOV lanes, park-and-ride lots, and other support facilities or elements.

HOV lane - Any preferential lane designated for exclusive use by vehicles with 2 or more occupants for all or part of a day, including a designated lane on a freeway, other highway or a street, or independent roadway on a separate right-of-way.

HOV system – Any coordinated region wide network of integrated HOV facilities.

Inherently Low Emission Vehicles (ILEV) – Any kind of vehicle which, because of the inherent properties of the fuel system design will not have significant evaporative emissions, even if its evaporative emission control system has failed. These vehicles are certified by the Environmental Protection Agency pursuant to 40 CFR 88.311-93 and labeled pursuant to 40 CFR 88.312.93.

Low Emission & Energy-Efficient Vehicles – A vehicle that has been certified as meeting the Tier II emission level under section 202(i) of the Clean Air Act for that make and model year and is certified by EPA to have achieved not less than a 50-percent increase in city fuel economy or not less than a 25 percent increase in combined city-highway fuel economy relative to a comparable vehicle that is an internal combustion gasoline fueled vehicle; or is an alternative fuel vehicle.

Occupancy requirement – Any restriction that regulates the use of a facility for any period of the day based on a specified number of persons in a vehicle.

Public transportation vehicle – A vehicle that that (1) provides designated public transportation as defined in Section 221 of the Americans with Disabilities Act of 1990 or provides public school transportation (i.e. to and from public or private primary, secondary, or tertiary schools); and (2) is owned or operated by a public entity; or is operated under a contract with a public entity; or is operated pursuant to a license by the Secretary or a State agency to provide motorbus or school vehicle transportation services to the public.

Single Occupancy Vehicle (SOV) –Any motor vehicle not meeting the established occupancy requirement of a HOV lane. While it is possible for a vehicle with more than one occupant to not meet the occupancy requirement if the standard is established at more than two persons, the term SOV is used to encompass all such vehicles not meeting the occupancy requirement.

Tier II Emission – The Tier II emission level established in regulations prescribed by the Environmental Protection Agency under section 202(i) of the Clean Air Act for that vehicle’s make, model, and model year. The Tier II emission standards are based on a system of emission bins in which light-duty vehicles and light-duty trucks are certified in one of the eight bins; Bin 1 represents the cleanest or lowest emitting vehicles, and Bin 8 represents the highest emitting vehicles of the Tier II bins.

CHAPTER I INTRODUCTION

This program guidance, which applies to all federally funded high occupancy vehicle (HOV) facilities, supersedes the previous version issued on March 28, 2001. The revisions are made based on feedback received and issues identified during the past seven years and the requirements set forth in Section 1121 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), which is codified at 23 U.S.C. 166.

The purpose of this document is to provide information useful to States as they plan, design, operate, and manage HOV facilities. It is intended to be non-binding and should not be construed as a rule of general applicability. This document provides examples for States to follow in evaluating proposed significant changes to the operation of an HOV lane, to include conversion of an HOV lane to a High Occupancy Toll (HOT) lane.

The FHWA supports HOV lanes as a cost-effective and environmentally friendly option to help move people along congested urban and suburban routes. As such, FHWA regulations at 23 C.F.R. 810.102 specifically provide that HOV lanes are eligible for Federal-aid participation. In locations where existing or anticipated excess HOV lane capacity is available, conversion to a HOT lane facility is encouraged as a way to increase throughput and to provide additional travel options for drivers.

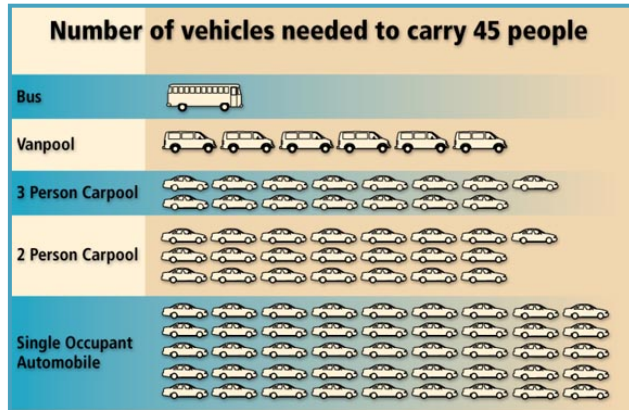


As part of an overall approach to respond to increased travel demand and address traffic congestion, HOV and HOT lanes can be a practical alternative to adding more general-purpose travel lanes. The FHWA encourages the implementation of HOV or HOT lanes as an important part of an area-wide approach to help metropolitan areas address their requirements for improved mobility, safety, and productivity, while also being sensitive to environmental and quality of life issues.

CHAPTER II CONCEPT, BACKGROUND, AND HISTORY

Concept

The primary purpose of an HOV lane is to increase the total number of people moved through a congested corridor by offering two kinds of incentives: a savings in travel time and a reliable and predictable travel time. Because HOV lanes carry vehicles with a higher number of occupants, they may move significantly more people during congested periods, even when the number of vehicles that use the HOV lane is lower than on the adjoining general-purpose lanes. In general, carpoolers, vanpoolers, and transit users are the primary beneficiaries of HOV lanes.



HOV facilities have proven to be effective enhancements to the transportation system in many metropolitan areas. These facilities are most appropriate and are most needed in corridors with high levels of travel demand and traffic congestion. In these situations, HOV facilities can provide the travel times saving and improved travel time reliability necessary to encourage commuters to change from driving alone to using transit services, vanpools, and carpools. HOV lanes work best where significant roadway congestion during the peak periods occurs and HOV support facilities such as park and ride lots are provided. Experience with HOV lanes from around the country has shown a positive relationship between ridership and travel time savings, suggesting that, as congestion grows, the travelers' willingness to carpool or ride on a bus that uses an HOV lane also grows.

In locations where HOV lanes are underutilized or where excess capacity on the HOV facility exists, conversion to HOT lanes is suggested as a way to increase use and to provide more choices to drivers. HOT lanes allow single-occupancy vehicles (SOVs) or lower-occupancy vehicles (LOVs), that is, vehicles with a number of occupants lower than the posted vehicle occupancy restrictions, to use an HOV lane for a fee, while maintaining free travel for qualifying HOVs. Currently, there are seven HOT facilities in the U.S. The I-15

HOT Facilities in the U.S.

- I-15 in San Diego, CA
- I-394 in Minneapolis, MN
- I-25 in Denver, CO
- I-10 Katy Freeway in Houston, TX
- US 290 in Houston, TX
- I-15 in Salt Lake City, UT
- SR 167 in Seattle, WA

FasTrak™ Express Lanes in San Diego, the I-394 MnPASS program in Minneapolis, the I-25 Express Lanes in Denver, the I-15 Express Lanes in Salt Lake City, and the SR 167 HOT Lanes in Seattle allow SOVs to use the HOV lanes for a fee, while the QuickRide program on the I-10 West

and US 290 HOV lanes in Houston charges vehicles with 2 or fewer occupants a toll while vehicles with three or more persons (3+) are allowed to travel for free during the restricted period.



To maximize the congestion-reducing benefits of an HOT lane facility, the toll charged should vary by time of day and/or level of congestion. Tolls can be varied by time of day, monthly, or quarterly based on historical highway use, or can vary dynamically over the course of the day based on real-time traffic conditions. The use of real-time or historically based variable tolling on HOT lanes may have a significant positive effect on traffic flow. For example, the MnPASS HOT lanes in Minneapolis

vary the toll rates using real-time pricing, with the rates being updated every three minutes to reflect the amount of traffic on the road.

Effective management of an HOV lane involves developing and using an HOV operation and enforcement plan, along with a performance-monitoring program. Accurate and possibly real-time information about the performance of the HOV lanes, the general-purpose freeway lanes, and other supporting services and facilities is particularly useful. The information provided through an HOV monitoring program is also critical for assessing the impact of possible changes in vehicle-eligibility requirements, vehicle-occupancy levels, and operating hours.

Background

The development of HOV facilities has evolved since the early 1970s. The bus-only lane on the Shirley Highway in Northern Virginia/Washington, D.C. and the contraflow bus lane on the approach to New York-New Jersey's Lincoln Tunnel pioneered the freeway HOV application in this country. Many of the initial HOV lanes were bus-only applications or allowed buses and vanpools. In an effort to maximize use, carpools became the dominant use group on most projects during the 1970s and 1980s. The vehicle-occupancy requirements for carpools have also evolved over time. A 3+ occupancy level was initially used on many projects, but most current facilities use a two-person per vehicle (2+) carpool designation. Today, there are over 130 freeway HOV facilities in metropolitan areas in the U.S.

As recognized in the 2007 Economic Report of the President, congestion is a growing problem in American urban areas. The U.S. has close to four million miles of roads, bridges, and highways to support a wide variety of economic and social activity. However, over time the demands on this infrastructure have outstripped its capacity. While the miles of urban roadways built have increased by nearly 60 percent since 1980, vehicle miles traveled on urban roadways increased by about 120 percent. As a result, traffic in most metropolitan areas has become increasingly congested, costing both time and fuel. In 2003 alone, Americans were delayed about 3.7 billion hours and used 2.3 billion extra gallons of fuel in stop-and-go traffic.

To address the continued growth of congestion, cities and States have shown a growing interest in managing travel demand by setting prices for road use during peak periods. Among the various pricing schemes, HOT lanes have proven to be of particular interest because they not only address congestion in the short run, but they also demonstrate the benefits of more aggressive pricing strategies. And, they offer the customer travel time savings and a guaranteed level of service. HOT lanes are part of a broader managed lanes concept that employs market forces to help optimize use of the facilities.



Most of the HOT lanes implemented in the U.S. were piloted under the Value Pricing Pilot Program (VPPP). Prior to the passage of SAFETEA-LU, the VPPP was the only program under which HOT lanes could be implemented. In general, the VPPP allows up to fifteen States to evaluate the feasibility and deployment of innovative pricing strategies, including HOT lanes as experimental pilot projects on the Interstate System. However, SAFETEA-LU mainstreamed the authority to create HOT lanes and now all States are allowed to create HOT facilities. States are now encouraged to implement HOT lanes under 23 U.S.C. 166. However, under certain circumstances, FHWA may grant a State authority to toll HOV lanes under the VPPP. Although this document addresses the conversion of HOV lanes to HOT lanes, States can also create HOT lanes by building new lanes where no conversion would be required.

CHAPTER III OVERVIEW OF LEGISLATION

Section 1121 of SAFETEA-LU (Pub. L. 109-59, Aug. 10, 2005) replaces Section 102(a) of Title 23 of the United States Code (23 U.S.C.) with a new Section 166 that provides expanded options for operating HOV facilities. States now have additional flexibility with which to manage the use of their HOV-lane capacity by allowing some vehicles to travel exempt from the minimum vehicle occupancy requirements. For example, HOT or qualified low emission and energy-efficient vehicles (such as hybrids) SOVs/LOVs may use HOV lanes. The remainder of this chapter presents an overview of the key features in the legislation. Subsequent chapters discuss the legislative requirements for implementing the key provisions. A copy of the statute is provided in Appendix A.

Occupancy Requirement - 23 U.S.C. 166 (a)

The 2+ vehicle occupancy requirement remains unchanged from TEA-21. A State agency that has jurisdiction over the operation of an HOV facility continues to have the authority to establish the occupancy requirements of vehicles operating on the facility.

Allowable Exceptions and Tolls - 23 U.S.C. 166(b)

SAFETEA-LU gave operating agencies responsible for HOV facilities the option of allowing three specific vehicle classes to travel on such facilities exempt from the posted vehicle occupancy requirements: (1) public transportation vehicles (i.e., out-of-service); (2) HOT vehicles; and (3) low emission and energy-efficient vehicles (such as hybrids). In addition, SAFETEA-LU provides the procedures that States must use to restrict motorcycle and bicycle operations on HOV facilities. Each of the vehicle types are discussed in the following sections of this chapter and a summary of the requirements for these exceptions to minimum occupancy requirements is provided in Appendix B.

Section 166(b)(4) requires States to toll vehicles traveling on HOV facilities exempt from the minimum occupancy requirements (except for bicycles, motorcycles, and low emission and energy-efficient vehicles). Section 166(b)(5) gives States discretion in deciding whether or not to toll, or to toll at a discounted rate, out-of-service public transportation vehicles, inherently low emission vehicles (ILEVs) and low emission and energy-efficient vehicles. Motorcycles and bicycles may not be tolled.

Tolled Vehicles

Title 23 U.S.C. 166 allows States to toll vehicles for access to HOV lanes only when (1) they do not meet the established occupancy requirements of the lane (e.g., HOV-2 on an HOV-3 facility) or (2) they are ILEV or low emission and energy-efficient vehicles. HOT vehicles must be tolled; the tolling of low emission and energy-efficient vehicles and SOV public transportation vehicles is optional. Motorcycles and bicycles may not be tolled.

High Occupancy Toll Vehicles - 23 U.S.C. 166(b)(4)

A HOT vehicle is any vehicle that is charged a toll to use an HOV facility when it does not meet the posted minimum occupancy requirements for an HOV lane. If a State decides to allow HOT vehicles to use an HOV lane, the State must also (1) establish programs addressing how operators of HOT vehicles can enroll and participate in the toll program; (2) develop, manage, and maintain a system that will automatically collect the toll; and (3) establish policies and procedures to manage the demand of the facility by such vehicles by varying the toll amount and enforcing violations. Further, operational performance must be consistent with Federal requirements. In addition, a toll agreement must be executed between the FHWA, the State Department of Transportation, and operating agencies. HOT lanes may be established on both Interstate and non-Interstate facilities.

Inherently low emission vehicles (ILEV) and low emission and energy-efficient vehicles - 23 U.S.C. 166(b)(5)

This section extends the existing exemption for ILEVs and adds another exemption for low emission and energy-efficient vehicles. *Until September 30, 2009*, States may allow ILEVs and vehicles certified and labeled as low emission and energy-efficient vehicles (including alternative fuel vehicles) that do not meet the established occupancy requirements to use HOV facilities so long as the State establishes procedures to enforce the restrictions on the use of the facility by these vehicles. These vehicles may be tolled, but, unlike HOT vehicles, the toll is not required. After September 30, 2009, the States must discontinue use of their HOV lanes by such vehicles.

The Clean Air Act Amendments created the ILEV program and TEA-21 allowed States to authorize ILEVs to use HOV lanes without meeting the occupancy requirements. The EPA administers the certification, labeling, and other regulatory provisions of the ILEV program and maintains an updated list of certified ILEVs at <http://www.epa.gov/otaq/cff.htm>.

According to section 23 U.S.C. 166(f)(3) “Low emission and energy-efficient vehicles” (generally hybrid vehicles) are defined as those that have been (1) certified by the EPA as meeting the Tier II emissions level established pursuant to section 202(i) of the Clean Air Act for a given make and model year and (2) certified by the EPA as achieving not less than a 50 percent increase in city fuel economy or not less than a 25 percent increase in combined city-highway fuel economy relative to a comparable vehicle that is an internal combustion gasoline fueled vehicle (other than a vehicle that has propulsion energy from on-board hybrid sources). The EPA will issue a final rule that establishes the certification and labeling requirements for low emission and energy-efficient vehicles. The EPA will also establish guidelines and procedures for making performance comparisons between low emission and energy-efficient vehicles and comparable gasoline-fueled internal combustion powered vehicles. On May 24, 2007, the EPA published a notice of proposed rulemaking (72FR29102). A final rule has not yet been published.

The category of low emission and energy-efficient vehicles also includes alternative fuel vehicles. “Alternative fuel vehicles” are vehicles that operate solely on methanol or other alcohols; a mixture of at least 85 percent methanol or other alcohols, natural gas, liquefied petroleum gas, hydrogen, coal derived liquid fuels, fuels derived from biological materials; or electricity.

States are permitted to implement a more stringent definition of low emission and energy-efficient vehicles in order to better manage the performance of their HOV lanes when used by these vehicles. For example, a State may choose to allow only low emission and energy-efficient vehicles that can demonstrate an 85 percent increase in city fuel economy and a 25 percent increase in city-highway fuel economy, or a 45 percent increase in combined city/highway fuel economy and a 50 percent increase in city fuel economy (or increase both percentages) to travel as SOVs/LOVs. States may also implement other requirements to restrict the use of their HOV facilities by low emission and energy-efficient vehicles, such as caps on the number of eligible vehicles or vehicle class or weight restrictions. However, States may not implement other fuel economy based standards, such as a miles-per-gallon standard, because any fuel economy based standard that is not based on the percentages framework provided at 23 U.S.C. 166(f)(3) conflicts with Federal law.

Public Transportation Vehicles (Out-of-Service) - 23 U.S.C. 166(b)(3)

Public transportation vehicles are vehicles that provide designated public transportation, as defined in 42 U.S.C. 12141, or provide public or private primary, secondary or tertiary school transportation. Public transportation vehicles must be owned and operated by a public entity, operated under a contract with a public entity, or operated pursuant to a license by the Secretary or State agency to provide motorbus or school vehicle transportation services to the public. States may allow public transportation vehicles that do not meet the established occupancy requirement (i.e., public transit vehicles on deadhead trips) to use HOV facilities without charge if the State agencies establish requirements for identifying the vehicles and set procedures for enforcement.

Motorcycles and bicycles - 23 U.S.C. 166(b)(2)

Motorcycles and bicycles must be allowed to use HOV facilities. However, a State may elect to restrict motorcycle or bicycle (or both) use of an HOV facility due to safety concerns. If a State does decide to exclude motorcycles and/or bicycles, a certification stating that their presence creates a safety hazard must be submitted to the FHWA for approval. Prior to acceptance, the FHWA will publish the request in the *Federal Register*, providing an opportunity for public comment. After the State has addressed the comments received (if any), FHWA will approve the request. States should submit their certifications to the FHWA Division Office.

Certification – 23 U.S.C. 166 (d)

When States implement low emission and energy-efficient and/or HOT vehicle exception(s), they must annually certify that operational performance monitoring programs and enforcement programs are in place to ensure that the performance of the subject facility is not degraded and is operated in accordance with the restrictions and requirements of 23 U.S.C. 166. As part of the certification, the State must document that the performance of the facility is not currently degraded and must further document the actions that will be taken to guarantee that operational performance will not become degraded in the future. If the operation of an HOV facility open to HOT or low emission and energy-efficient vehicles becomes degraded, States must take necessary actions, such as limiting or discontinuing the use of HOV facilities by sufficient number of these vehicles or

increasing the price paid by exempt vehicles for access to HOV lanes.

To avoid the need for potential corrective action, States are encouraged to work with their local FHWA Division Office before allowing SOV/LOV, HOT or low emission and energy-efficient vehicles (i.e., hybrid vehicles) to use HOV facilities. More information on the certification requirements can be found in Chapter IV.

Until such time as the EPA issues its final regulations (see previous section), the Division Administrator's acceptance will be conditional on the State's agreement to update its program to incorporate the EPA requirements once the final rule becomes effective.

Applicability of the National Environmental Policy Act (NEPA)

State agencies with jurisdiction over HOV facilities hold the sole authority to set occupancy requirements and to implement any of the HOV occupancy exceptions under 23 U.S.C. 166(b). There is no discretionary decision or any approval action to be made by the FHWA in these areas, except where a State wishes to exclude motorcycles or bicycles from an HOV lane under 23 U.S.C. 166(b)(2)(B). As such, NEPA does not apply to the States' actions in setting the occupancy requirements or implementing any of the HOV occupancy exceptions, including converting HOV lanes into HOT lanes under 23 U.S.C. 166(b)(4). Only when other factors, such as Federal-aid funding or a need to amend previous commitments, give rise to a FHWA approval must the FHWA perform a NEPA evaluation. States are encouraged to coordinate with the local FHWA Division Office in the early planning phase in determining whether the implementation of any exception, such as the conversion of a HOV lane into a HOT lane, will be part of a Federal-aid project or whether any previous commitments made in prior NEPA decisions or Federal-aid project agreements require any FHWA actions or approvals that would trigger a NEPA review. It should be noted that, even if the project is a "pure" §166 action and may not involve any discretionary Federal action, certain conformity requirements must be met under 40 CFR 93.121 if it is a regionally significant project within an air quality nonattainment or maintenance area. This applies to projects that require adoption or approval by any State, regional, or local agencies that routinely receive title 23 U.S.C. or Federal Transit Laws funds, as defined in 40 CFR 93.101.

CHAPTER IV IMPLEMENTATION

Implementing an HOV facility involves various activities and coordination of a variety of agencies and groups. Taking a comprehensive and systematic approach to the implementation process will help ensure that the facility is constructed, designed, and operated in a safe and efficient manner. For example, the development of a concept of operations and application of a systems engineering process will assist States in addressing system lifecycle costs from concept thru design, installation, testing, operations, and maintenance. Refer to the State DOT-FHWA Stewardship agreement for other applicable requirements, such as design approval for change of interstate access and Intelligent Transportation System architecture final rule compliance.

In the course of managing HOV facilities, some minor or significant physical or operational modifications may be needed to meet changing conditions. States are encouraged to work with their local FHWA Division Office if significant operational changes, relative to the annual certification or original project commitments, are proposed. In this way, agencies can ensure that all Federal statutory requirements and original project commitments are met. For example, operational changes, such as pricing SOV/LOVs will require the State to execute a toll agreement with FHWA as stated in 23 U.S.C. 166(c) before a HOT lane is deployed. In addition, original project commitments and/or the source of Federal funds used for implementation of the HOV lanes, may preclude certain changes to such facilities. For example, States may not be allowed to convert an HOV lane to a general-purpose lane if funds to construct the facility were made available under the Congestion Mitigation and Air Quality

Examples of significant operational changes:

- A significant change to the minimum occupancy requirement, for example a change from 2+ to 3+ or 2+ to 4+;
- Switching from 24-hour HOV lane operation to operation during only a portion of the day or week; or
- Allowing any exceptions to vehicle minimum occupancy requirement permitted in 23 U.S.C. 166(b), such as HOT vehicles or low emission and energy-efficient vehicles.

Improvement or the Interstate Maintenance programs. Other Federal funding sources may have similar requirements that limit the ability of operating agencies to change HOV/HOT lanes to general-purpose lanes or to establish a minimum occupancy requirement of four or more for an HOV facility where practically no or minimal HOV users exist.

Further, agencies that own and operate HOV lanes are encouraged to involve the FHWA Division Office in the development of programs and initiatives to monitor how well the lanes are functioning, to assess their effectiveness with regard to improving the efficiency of travel, to identify new strategies to improve performance, or to analyze the impacts of any significant changes on either the transportation system (including how it is operated), regional HOV system, or both.

Performance Monitoring, Evaluating, and Reporting Program

The purpose of monitoring and evaluating the performance of an HOV lane is to determine if the facility is meeting its goals and objectives. The results of the performance evaluation provide the basis for making revisions to improve the operation of the HOV system or specific lanes.

Implementation Process for Significant Operational Change

Example: I-25 HOV to HOT lanes conversion in Denver, Colorado

- Colorado Department of Transportation (CDOT) consulted with FHWA Division Office on proposed operational change.
- CDOT and FHWA conducted a process review.
- The review included (1) operational assessment of existing HOV lanes, (2) analysis of predicted operation of the current and future network with the proposed change, (3) compliance review of Federal requirements, environmental review, and original project commitment.
- CDOT submitted a request for toll authority.
- FHWA approved the request and executed a toll agreement with CDOT/Colorado Tolling Enterprise.
- I-25 HOT lanes project opened on June 2, 2006.

Evaluating HOV lanes is in some ways similar to evaluating other highway facilities where safety, vehicle volumes, and level of service are examined. However, HOV evaluations also examine facility impacts on the movement of people (how many people, as opposed to how many vehicles, use the lane); modal shifts (how many people changed their travel behavior to take advantage of the HOV lane); reliability; and travel-time savings. These are all important indicators of HOV lane performance.

The process for assessing possible HOV operating strategies should be similar to the one used to plan a project and should emerge from an established monitoring program. Information on vehicle and passenger volumes, travel speeds, travel-time savings, violation rates, and crashes should form the basis of an ongoing monitoring and evaluation program. This information can be used to identify possible problems and potential changes in the operation of an HOV facility.

Technical guidance and recommended practices on performance monitoring and evaluation of HOV systems can be found in the National Cooperative Highway Research Program Report 414: "HOV Systems Manual." For additional resources, refer to Chapter VI in this Program Guidance or visit the FHWA HOV Program Web site at <http://www.ops.fhwa.dot.gov/freewaymgmt/hov.htm>.

HOV Facility Management, Operation, and Monitoring (Freeways) - 23 U.S.C. 166 (d)

If States implement low emission and energy-efficient and/or HOT vehicle exception(s), they must operate in accordance with the restrictions and requirements of 23 U.S.C. 166 (d) which established a minimum average operating speed that HOV facilities with exempted vehicles must maintain. Although a State should provide or ensure a high level of service to preserve the primary purpose of HOV facilities to offer significant travel time and reliability benefits, there is no statutory requirement that the above definition should be used to establish the operational performance standard for an HOV facility that does not permit SOV/LOVs.

The minimum average operating speed is defined at Section 166(d)(2)(A) as 45 miles per hour (mph), for an HOV facility with a speed limit of 50 mph or greater, and not more than 10 mph below the speed limit for a facility with a speed limit of less than 50 mph. Section 166(d)(2)(B) provides that an HOV facility is considered degraded if it fails to maintain a minimum average operating speed 90 percent of the time over a consecutive 180-day period during morning or

Example: Determining Operational Performance

The Situation: A 20-mile HOV facility (that allows SOV hybrids) has a speed limit of 55 miles-per-hour (mph) and a one-mile long bottleneck with an average operating speed of 20 mph and a 50 mph average operating speed for the remainder of the facility. Does the performance of this facility meet the Federal requirement of a 45 mph average operating speed?

Although the average operating speed for the entire facility in this example is 46.5 mph, the facility may be considered degraded based on the predominant usage pattern and the impact of delays at the bottleneck.

If the predominant usage pattern consists of relatively short trips (5 or 10 miles) that pass through the bottleneck location, the average operating speed for these trips will be well under 45 mph and the facility would be considered degraded.

If the predominant usage pattern consists of longer trips that traverse most or all of the facility, including the bottleneck, the facility would not be considered degraded simply because of the relatively short bottleneck.

evening weekday peak hour periods (or both for a reversible facility). It is noted that a facility may have one or more locations where this operating speed is routinely not met, but still be able to maintain the minimum average operating speed over the length of the entire facility or segment. The impact of bottleneck delay on an HOV facility is dependent on the length of the bottleneck and the predominant usage pattern of the HOV facility. A minor bottleneck on a long facility may not be a problem – whereas a bottleneck on a short facility or on a critical segment could have a greater impact and lead to a degraded condition. See sidebar to left for example.

A minimum average operating speed can ideally be obtained by collecting data at multiple locations. Data collection points can either be spaced uniformly at equal distance apart from one another or at strategic locations. The monitoring should be conducted, at a minimum, during peak periods. A State should evaluate this regular monitoring information to develop an understanding of the operating and usage characteristics of the facility in order to assess whether overall incentives to use the HOV facility are adversely impacted by the bottleneck location(s).

The FHWA does not require use of a specific procedure or methodology for States to use in determining if the operational performance of an HOV facility is degraded. This is because each HOV facility has different characteristics and each State agency has different resources to collect and analyze data. The appropriate frequency of data collection should be determined based on the type of HOV facility, number and location of entrance and exit points, traffic patterns, etc. States are encouraged to create monthly reports as a means to continually monitor and evaluate the HOV facilities. A State DOT is encouraged to work with the local FHWA Division Office to develop a detailed performance-monitoring program that outlines the methodology it will use to determine whether the particular HOV facility meets the applicable Federal operational performance requirements.

If a State allows HOT or low emission and energy-efficient vehicles to use an HOV lane, and the lane becomes degraded, Section 166(d)(1)(C) requires the State to limit or discontinue the use of the lane by the number of HOT vehicles and/or low emission and energy-efficient vehicles

necessary to bring the facility back to compliance or to take other actions that will quickly bring the

operational performance up to the Federal standard. A showing that the HOT and low emission and energy-efficient vehicles caused the degradation is not required. The State has discretion in deciding which vehicles to limit or discontinue as well as the manner and means through which to do it. For example, the State may

Examples of Performance Monitoring Programs:

- I-394 MnPass HOT Lanes
- CA Statewide Hybrid Vehicle Program
- Long Island Expressway Clean Pass Pilot Program
- Washington State HOV System HERO Program

utilize a variety of options for improving the operation of its HOV facilities, such as improving enforcement, increasing the fuel economy percentages, increasing the occupancy requirements, establishing tolls, or varying the tolls by time of day or actual traffic conditions.

HOV Facility Management, Operation, and Monitoring (Arterials) - 23 U.S.C. 166(d)

Arterial street HOV facilities are found within a wide range of settings and environments in an urban area, for example, in downtown/central business districts, suburban activity centers, neighborhood commercial areas, and major commuter travel corridors. Arterial streets are typically designed to operate at travel speeds of 25 to 50 mph. Hence, the average operating speed must not be more than 10 mph below the speed limit for an arterial street facility, in accordance to 23 U.S.C. 166(d)(2)(A).

The operating environment for an HOV facility on an arterial street is much different from the operating environment on freeways. Examples of considerations used to determine the average operating speed for arterial facilities are: delays due to signalized intersections, driveway access, turning movements, on-street parking, and buses stopping to drop off and pick up passengers, etc. A State may derive an average operating speed based on the average travel time using these considerations.

Enforcement Program



Enforcement is critical to the successful operation of an HOV facility. The role of an HOV enforcement program is to protect the integrity of the facility by deterring possible violators and promote the safe and efficient use of the HOV lanes. If a State allows HOT or low emission and energy-efficient vehicles to use an HOV lane, the operating agency must establish, manage, and support an enforcement program that ensures the facility is being operated at the performance standards stated in 23 U.S.C. 166(d).

The FHWA may consider targeted enforcement an eligible operational expense in limited circumstances if the State demonstrates that it will deploy **additional** resources to specifically focus on HOV enforcement to improve the operational performance of the facility, not just supplement the overall enforcement budget.

Certification – 23 U.S.C. 166 (d)

This section presents the Federal certification requirements for States permitting low-emission and energy-efficient vehicles, as well as HOT vehicles, to travel on HOV facilities exempt from the posted HOV occupancy requirements. In addition, the Federal certification requirement for States to disallow use of HOV facilities by motorcycles and bicycles is also presented.

Low Emission and Energy-Efficient Vehicles and HOT Vehicles

When exempted vehicles are allowed to operate on HOV facilities, the State must annually certify to FHWA that it continues to meet all requirements of 23 U.S.C. 166, including those related to vehicle eligibility; operational performance monitoring, evaluation, and reporting; and enforcement. In particular, States are required to include in their certification a clear demonstration that the presence of low emission and energy-efficient or HOT vehicles has not caused the facility to become degraded (as defined by 23 U.S.C. 166(d)(2)(A)). The certification will be submitted to the FHWA Division Office the same time every year. Assuming compliance with the Federal requirements, the FHWA Division Administrator will annually renew his or her acceptance upon receipt of the State's certification.

If it is determined, based on the State's monitoring and evaluation of the performance of its HOV facility that the facility is or has become degraded as a result of low emission and energy-efficient vehicles or HOT vehicles, the State must take steps bring the facility back into compliance with Federal requirements as stated in 23 U.S.C. 166 (d)(2)(A). The Division Office should work with the State in developing a corrective action plan to bring the facility back to an acceptable level of performance within a reasonable timeframe.

Although there is no requirement for initial certification, States are encouraged to work with the local FHWA Division Office before allowing any HOT vehicles, alternative fuel vehicles, or low emission and energy-efficient vehicles (i.e., certified hybrid vehicles) that do not meet occupancy requirements to use HOV facilities to ensure Federal requirements are met and to avoid the need for corrective action. States are also encouraged to submit a revised certification to FHWA if significant operational changes, relative to the annual certification or original project commitments are proposed. States are further encouraged to actively manage their HOV/HOT facilities by evaluating and implementing necessary operational changes to meet specified performance requirements or to accommodate other changes in the operating environment.

With respect to low emission and energy-efficient vehicles, the State must commit to allow only vehicles that meet (or exceed) the Federal requirements established in 23 U.S.C. 166 and the upcoming EPA rulemaking. In the interim, the State must apply the eligibility requirements specified in 23 U.S.C. 166(b)(f)(3). This includes fuel economy percentages in 23 U.S.C. 166(f)(3)(B)(i). While there is no prescribed methodology for making the relevant vehicle comparisons to arrive at the fuel economy percentages, the States may refer to the May 24, 2007, EPA NPRM (72 FR29102) or develop and use their own reasonable methodologies until the EPA issues its final regulations. While the States may develop and use their own methodologies in the absence of EPA regulations, the FHWA Division Offices should work with the States to ensure that the States' methodologies are applied fairly and consistently for each vehicle. Until the EPA issues

its final regulations (see Chapter III), the Division Administrators' acceptance will be conditioned on the State's agreement to update its program to incorporate the EPA requirements once the rule becomes effective.

For HOT lanes, in addition to the above requirements, the following elements are also required in the annual certification as stated in 23 U.S.C. 166(d):

- The State must indicate the presence of a program that addresses how motorists can enroll and participate in the toll program.
- The State must indicate that they have implemented a system that will automatically collect the tolls, or indicate that such a system will be implemented in a reasonable period of time following establishment of the HOT lane.
- The State must demonstrate policies and procedures to manage demand for the facility by varying the toll amount, if necessary to ensure acceptable performance.

Motorcycles and Bicycles

In order to restrict motorcycle and/or bicycle use of an HOV facility the State must submit a certification to FHWA that such use would create a safety hazard as stated in 23 U.S.C. 166(b)(2). Prior to granting acceptance, FHWA will publish notice of the certification(s) in the *Federal Register* and provide an opportunity for public comment. The list of accepted certifications will be published at the FHWA HOV Program Web site at <http://www.ops.fhwa.dot.gov/freewaymgmt/hov.htm>.

There is no particular format that is required for certifications to restrict the use of HOV facilities by bicycles and/or motorcycles, although specific information is requested. The written requests should be submitted to the FHWA Division Office and include the following background information:

- The name, title, e-mail address, and phone number of the person who will act as the point of contact on behalf of the requesting agency;
- A description of the subject HOV facilities;
- A detailed explanation of why the presence of motorcycles and/or bicycles creates safety hazards; and
- A copy of policies or regulations regarding the restriction, if applicable.

Toll Agreements - 23 U.S.C. 166 (c)

If a State chooses to implement variable or dynamic pricing on an HOV facility, a Title 23 United States Code (U.S.C.) Section 166 toll agreement must be executed pertaining to the use of toll revenue collected from the operation of the facility. Specifically, tolls may be collected subject to

the requirements of Title 23 U.S.C. Section 129, which mandates that all toll revenues will be used first for debt service, for reasonable return on investment of any private person financing the project, and for the costs necessary for the proper operation and maintenance of the facility (including reconstruction, resurfacing, restoration, and rehabilitation). Section 129 further provides that if there are any excess revenues, then the State may use these revenues for any purpose that is eligible under Title 23 as long as the State annually certifies that the facility is being adequately maintained. Section 166 further requires that the State, in using any excess toll revenue, give priority consideration to projects for developing alternatives to SOV travel and projects for improving highway safety. A model toll agreement is provided at Appendix C.

In executing a toll agreement, States should work with the FHWA Division Offices. The FHWA Division Offices will coordinate with FHWA Office of Operations (HOP) in Headquarters to ensure that all necessary provisions are included in the agreement prior to its execution.

The State Transportation Department should sign at least two counterpart originals of the toll agreement. If another public authority or private entity will have jurisdiction over the facility, then they should sign the original agreements as well. Once all the original agreements have been signed, the State should transmit the signed originals to the FHWA Division Office, which will then forward them to the HOP in Washington, DC. Enough signed originals should be provided so that each signatory will receive an original for their records after FHWA signs the agreements. The originals should not be dated prior to submitting them to FHWA HOP.

CHAPTER V STRATEGIES TO REDUCE CONGESTION AND IMPROVE AIR QUALITY

Highway congestion has increased dramatically over the past two decades. At its most fundamental level, highway congestion is caused by the lack of a mechanism to efficiently manage use of existing capacity. Economists have long advocated that pricing the costs of congestion directly is the most viable means to address this problem and reduce overall congestion costs. As stated in the 2007 Economic Report of the President, small changes in the number of cars using a particular roadway at a given time can result in large improvements in the flow of traffic. For instance, the addition of just a few school buses makes traffic flow noticeably worse on the first day of school, while traffic flow is noticeably better on some State holidays when only a small number of residents stay home from work. Congestion pricing dampens demand for roads during peak hours and spreads usage over a longer time period. Differentiating the price of a good by the time of day effectively allocates limited capacity during periods of higher demand.

Effectiveness of HOV Facilities

As travel and congestion continue to increase, HOV/HOT lanes and other travel demand management techniques will be found to be increasingly valuable as strategies to reduce congestion and improve air quality. An investment in HOV and HOT lanes demonstrates a region's long-term commitment to plan for and make cost-effective investment decisions that reduce congestion and positively influence the mobility, safety and productivity of multi modal facilities, corridors and metropolitan transportation systems. In locations where HOV lanes are underutilized or where anticipated excess capacity on the HOV facility exists, conversion to HOT lanes is suggested as a way to increase use and to provide more choices to drivers.

SAFETEA-LU Section 1121 (23 U.S.C. Section 166) provides States more flexibility to manage the operational performance of HOV lanes by allowing certain vehicle exceptions when existing or anticipated excess capacity exists. A key to ensuring the effectiveness of HOV/HOT facilities is to continuously monitor and evaluate their operational performance and then make necessary adjustments. Enforcement is also critical to the successful operation of an HOV/HOT facility. The role of an HOV enforcement program is to protect the integrity of the facility by deterring possible violators, thus promoting the safe and efficient use of the HOV lanes. Some of the typical indicators of efficient HOV/HOT lane performance are: high vehicle and people throughputs, reliable travel time and transit services, and low violation rates. In locations where HOV lanes are underutilized or overcrowded, States may apply one or a combination of the following operational strategies to optimize the HOV lanes performance.

- Pricing
- Occupancy Requirement (increase or decrease)
- Vehicle Eligibility

The following sections will explain how these operational strategies can potentially enhance the performance of HOV facilities.

Pricing

Many HOV lanes do not make full use of their capacity. Consequently, more SOV/LOV traffic than necessary is forced to use congested general-purpose lanes. Congestion can be reduced, and the overall throughput of the highway corridor can be increased, if convert an HOV lane is converted to HOT lane, allowing vehicles that do not meet the established minimum occupancy requirement to use the HOV lane on payment of a toll.

The U.S. Department of Transportation strongly endorses the use of HOT lanes as an effective strategy to address congestion. The toll should be varied in accordance with travel conditions and should be set at a high enough level that the performance of the HOV lane is not degraded. This optimizes the vehicle throughput of the HOT lane and reduces congestion in the general-purpose lanes by drawing off some of the SOV traffic that would otherwise be forced to use those lanes. So HOVs are no worse off, and vehicles that do not meet the vehicle occupancy requirement, whether they use the HOT lane or the general-purpose lanes, are better off.



The FHWA encourages States to take advantage of the use of the HOT lane option provided in 23 U.S.C. 166, so long as the performance of the HOV lane is continuously monitored and continues to meet specified performance standards. States should consider converting HOV lanes to HOT lanes whenever the capacity of the HOV lanes is underutilized and congestion occurs in the general-purpose lanes. It is, of course, important that States be prepared to comply with the statutory criteria for establishing a HOT lane – automatic tolling, dynamic tolls that vary with the level of congestion, adequate enforcement, and ongoing performance monitoring, evaluation, and reporting and modification of operations when approaching degraded conditions. The toll amount should be varied based on historical highway use and/or real-time traffic conditions. Chapter IV provides the definition of a degraded HOV lane.



In instances where the State wants to implement a HOT lane, but does not yet have a program addressing how motorists can enroll and participate in the program, an automatic toll collection system, or policies and procedures to vary the toll amount and enforce violations, the FHWA has determined that the State can proceed to implement its HOT lane so long as the State is committed to full implementation each of the section 166(b)(4)(A) – (C) provisions within reasonable period of time. The period of time is flexible

and will be based on the State's legitimate, short-term needs to fully implement each of these provisions. If the State cannot fully implement these provisions within the time proposed by the State and approved by the FHWA, then the State's toll authority will be revoked. For example, the Utah Department of Transportation (UDOT) permits SOVs that hold prepaid monthly stickers to

travel on the I-15 Express (HOT) Lanes in Salt Lake City. The FHWA executed a toll agreement with UDOT providing that this conditional toll authority will expire on June 30, 2009 unless UDOT can demonstrate to FHWA that it is fully implementing the automatic and variable tolling provisions of Section 166.

Despite their potential benefits, HOT lanes are sometimes incorrectly portrayed as “Lexus Lanes.” The contention is that only higher income drivers that can take advantage of these facilities while lower income drivers must continue to be stuck in traffic. As stated in the 2007 Economic Report of the President, one study finds that drivers with higher incomes tend to use HOT lanes more often than lower income drivers, but that lower income drivers rely on toll lanes when on-time arrival at their destination is important. A recent survey also finds that support for or opposition to HOT lanes is unrelated to income. Therefore, HOT lanes provide choices to all drivers.

Additional factors to be considered in connection with HOV to HOT conversion include public acceptance, toll schedule/structures, the cost of the tolling infrastructure and operating strategies, use of revenues generated from the project, identifying qualifying vehicles, and methods to restrict use.

Occupancy Requirement

HOV facilities offer States the ability to match vehicle eligibility criteria and vehicle occupancy requirements to the demand for the lane. Under 23 U.S.C. 166 (a), the States retain the authority to establish the minimum occupancy requirements of their HOV lanes, so long as the minimum occupancy is no less than two. The goal is to set the occupancy requirement at a level that will encourage the use of carpooling, vanpooling, and transit services without overloading the capacity of the HOV lane.

The goal is to set the occupancy requirement at a level that will encourage the use of carpooling, vanpooling, and transit services without overloading the capacity of the HOV lane.



Changes in the designated vehicle-occupancy restrictions may be needed over the life of an HOV facility. For example, some HOV lanes using a 2+ requirement have experienced congestion resulting in reductions in trip time reliability and slower travel times. This situation happened on both the I-10 West and U.S. 290 HOV lanes in Houston. To address this problem, the vehicle-occupancy requirements were increased to 3+ during the morning and afternoon peak-hours. States are strongly encouraged to increase vehicle-occupancy levels in the event that facility performance becomes degraded. In locations where HOV lanes are overcrowded, States may combine pricing and occupancy requirement modification strategies to improve performance.

Three projects – the El Monte Busway on the San Bernardino Freeway in Los Angeles, the I-10 West, and U.S. 290 HOV lanes in Houston – use a 3+ occupancy requirement during the morning and afternoon peak-hours and a 2+ requirement at other times.

However, States should set an occupancy requirement that reasonably facilitates the use and operation of carpools. In other words, States should establish the occupancy requirement at a level related to the performance of HOVs on the facility. For example, it is highly unlikely that many private vehicles that are used for carpools will be able to meet a 10+ occupancy requirement. Currently, the FHWA does not know of any HOV lane with an occupancy requirement above four. Therefore, a rebuttable presumption is created where the FHWA will presume that any HOV occupancy requirement over four bears no relationship to the performance of the HOV lane.

Vehicle Eligibility

A number of factors may need to be considered in assessing possible changes in vehicle-eligibility requirements for an HOV facility. The exact factors and issues will vary by metropolitan area and by the type of change in the vehicle-eligibility requirements being considered. Typical

factors include HOV project goals and objectives, facility type and length, design treatments, congestion levels in the HOV lane and the general-purpose freeway lanes, bus operations, system connectivity, and supporting services and facilities. Other important factors to consider include safety, enforcement, and perceptions of HOV lane users, non-users, and policy makers.

Hybrid Vehicles Pilot Programs

- New York Long Island Expressway
- California Statewide Program
- Arizona HOV Pilot Program



One option to use excess HOV lane capacity is to allow environmentally friendly vehicles that do not meet the occupancy requirement to use HOV lanes for free or for a fee. As stated in 23 U.S.C. 166, States are authorized to permit ILEV and/or qualified low emission and energy-efficient vehicles (i.e., hybrid and alternative fuel vehicles) to use HOV lanes without meeting minimum occupancy requirements. States may also allow eligible public transportation vehicles that do not meet minimum occupancy requirement, such as

out-of-service or deadheading transit vehicles as defined in 23 U.S.C. 166(b)(3), to travel on HOV lanes free of charge.

In addition to the pricing, occupancy requirement, and vehicle eligibility operational strategies, other travel demand management strategies can also be used to improve HOV system performance on both a region-wide and facility-specific basis include: guaranteed ride home programs; telecommuting and alternate work schedules; growth management, land use policies, and zoning ordinances; parking management; trip reduction ordinances; and traveler information systems.

CHAPTER VI RESOURCES

FHWA/FTA Offices

- FHWA Field Offices: <http://www.fhwa.dot.gov/field.html> - fieldsites
- FHWA Office of Transportation Management:
<http://www.ops.fhwa.dot.gov/freewaymgmt/hov/index.htm>
- FTA Regional Offices: http://www.fta.dot.gov/regional_offices.html

HOV Pooled Fund Study

The goal of the HOV Pooled-Fund Study (HOV PFS) (Study Number TPF-5 (029)) is to assemble regional, State, and local agencies, and the Federal Highway Administration (FHWA) to (1) identify issues that are common among agencies; (2) suggest projects and initiatives; (3) select and initiate projects intended to address identified issues; (4) disseminate results; and (5) assist in solution deployment. Please visit the Web site at <http://hovpfs.ops.fhwa.dot.gov/overview.cfm> for more information.

Transportation Research Board Committees on HOV Systems and on Congestion Pricing

The Transportation Research Board standing committees on HOV Systems is concerned with priority measures for HOVs, including guidelines for planning, designing, operating, and evaluating HOV priority facilities and the development, validation, and dissemination of theoretical, experimental and applied research related to HOV priority facilities. The objectives of the committee include assisting in enhancing the performance, safety, and efficiency of HOV facilities and establishing preferential HOV improvements as an integral element of the urban transportation system.

For more information, visit the committee homepage at <http://www.hovworld.com>.

The TRB Congestion Pricing Committee fosters research to gain a better understanding of the technological, operational, business, administrative, political and institutional aspects of innovative congestion pricing of systems and services for all modes of transportation. Strategies include integrated transit, variable pricing, aviation pricing, parking pricing, parking “cash-out,” and other mechanisms that seek to affect transportation demand and use. The Committee seeks to develop a comprehensive understanding of the effects of congestion pricing on the transportation system, addressing passenger and freight mobility, transit and highway interdependence, and interoperability of systems. For more information, visit the committee homepage at www.trb-pricing.org.

HOT Lane Projects Websites

- I-25 HOV/Tolled Express Lanes: <http://www.dot.state.co.us/cte/expresslanes/tollmain.cfm>
- I-394 MnPass Express Lanes: <http://www.mnpass.org/394/index.html>
- Utah's Express Lanes: <https://secure.utah.gov/expresslanes/action/public/index>
- I-15 FasTrak: <http://www.sandag.org/index.asp?classid=29&fuseaction=home.classhome>
- Houston's QuickRide: http://www.quickride.org/about_quickride.stm
- SR 167 HOT Lanes: <http://www.wsdot.wa.gov/Projects/SR167/HOTLanes/>

Hybrid Vehicle Programs

- California: <http://www.arb.ca.gov/msprog/carpool/carpool.htm>
- New York's CleanPass Program: <http://www.dot.state.ny.us/traffic/its/cleanpassintro.html>

Publications

- HOV Systems Manual, National Cooperative Highway Research Program Report 414
- A Guide for HOT Lane Development, Publication Number FHWA-OP-03-009
- Congestion Pricing: A Primer, Publication Number FHWA-HOP-07-04
- AASHTO Guide for Park-and-Ride Facilities, November 2004, Pub. Code: GPRF-2
- AASHTO Guide for High-Occupancy Vehicle Facilities, November 2004, Pub. Code: GHOV-3
- Houston Managed Lanes Case Study: The Evolution of the Houston HOV System
- New Jersey I-80 & I-287 HOV Lane Case Study: Executive Edition, EDL No. 13157
- New Jersey I-80 & I-287 HOV Lane Case Study, EDL No. 12963
- Effects of Changing HOV Lane Occupancy Requirements: El Monte Busway Case Study, FHWA-OP-03-002, EDL No. 13692
- Executive Report: Effects of Changing HOV Lane Occupancy Requirements: El Monte Busway Case Study, FHWA-OP-03-001, EDL No. 13679
- An Assessment of HOV Facilities in America, August 1992
- HOV Marketing Manual, April 1994
- Operational Design Guidelines for HOV Lanes in Arterial Roadways, November 1994
- Predicting HOV Lane Demand, August 1996
- Use of Videotape in HOV Lane Surveillance and Enforcement, March 1990
- HOV Lane Violation Study, January 1990
- HOV System Development in the U.S., December 1990
- Proceedings of the 11th International Conference on High-Occupancy Vehicle Systems, October 2002, FHWA-OP-03-100, EDL No. 13810

APPENDIX A

SAFETEA-LU Section 1121 HOV Facilities (23 U.S.C. 166)

SEC. 1121. HOV FACILITIES.

(a) In General.--Subchapter I of chapter 1 of title 23, United States Code (as amended by section 1120 of this Act), is amended by adding at the end the following:

``Sec. 166. HOV facilities

``(a) In General.--

``(1) Authority of state agencies.--A State agency that has jurisdiction over the operation of a HOV facility shall establish the occupancy requirements of vehicles operating on the facility.

``(2) Occupancy requirement.--Except as otherwise provided by this section, no fewer than two occupants per vehicle may be required for use of a HOV facility.

``(b) Exceptions.--

``(1) In general.--Notwithstanding the occupancy requirement of subsection (a)(2), the exceptions in paragraphs (2) through (5) shall apply with respect to a State agency operating a HOV facility.

``(2) Motorcycles and bicycles.--

``(A) In general.--Subject to subparagraph (B), the State agency shall allow motorcycles and bicycles to use the HOV facility.

``(B) Safety exception.--

``(i) In general.--A State agency may restrict use of the HOV facility by motorcycles or bicycles (or both) if the agency certifies to the Secretary that such use would create a safety hazard and the Secretary accepts the certification.

``(ii) Acceptance of certification.--The Secretary may accept a certification under this subparagraph only after the Secretary publishes notice of the certification in the Federal Register and provides an opportunity for public comment.

``(3) Public transportation vehicles.--The State agency may allow public transportation vehicles to use the HOV facility if the agency--

``(A) establishes requirements for clearly identifying the vehicles; and

``(B) establishes procedures for enforcing the restrictions on the use of the facility by the vehicles.

``(4) High occupancy toll vehicles.--The State agency may allow vehicles not otherwise exempt pursuant to this subsection to use the HOV facility if the operators of the vehicles pay a toll charged by the agency for use of the facility and the agency--

``(A) establishes a program that addresses how motorists can enroll and participate in the toll program;

``(B) develops, manages, and maintains a system that will automatically collect the toll; and

``(C) establishes policies and procedures to--

“(i) manage the demand to use the facility by varying the toll amount that is charged; and

“(ii) enforce violations of use of the facility.

“(5) Low emission and energy-efficient vehicles.--

“(A) Inherently low emission vehicle.--Before September 30, 2009, the State agency may allow vehicles that are certified as inherently low-emission vehicles pursuant to section 88.311-93 of title 40, Code of Federal Regulations (or successor regulations), and are labeled in accordance with section 88.312-93 of such title (or successor regulations), to use the HOV facility if the agency establishes procedures for enforcing the restrictions on the use of the facility by the vehicles.

“(B) Other low emission and energy-efficient vehicles.--Before September 30, 2009, the State agency may allow vehicles certified as low emission and energy-efficient vehicles under subsection (e), and labeled in accordance with subsection (e), to use the HOV facility if the operators of the vehicles pay a toll charged by the agency for use of the facility and the agency--

“(i) establishes a program that addresses the selection of vehicles under this paragraph; and

“(ii) establishes procedures for enforcing the restrictions on the use of the facility by the vehicles.

“(C) Amount of tolls.--Under subparagraph (B), a State agency may charge no toll or may charge a toll that is less than tolls charged under paragraph (3).

“(c) Requirements Applicable to Tolls.--

“(1) In general.--Tolls may be charged under paragraphs (4) and (5) of subsection (b) notwithstanding section 301 and, except as provided in paragraphs (2) and (3), subject to the requirements of section 129.

“(2) HOV facilities on the interstate system.-- Notwithstanding section 129, tolls may be charged under paragraphs (4) and (5) of subsection (b) on a HOV facility on the Interstate System.

“(3) Excess toll revenues.--If a State agency makes a certification under section 129(a)(3) with respect to toll revenues collected under paragraphs (4) and (5) of subsection (b), the State, in the use of toll revenues under that sentence, shall give priority consideration to projects for developing alternatives to single occupancy vehicle travel and projects for improving highway safety.

“(d) HOV Facility Management, Operation, Monitoring, and Enforcement.--

“(1) In general.--A State agency that allows vehicles to use a HOV facility under paragraph (4) or (5) of subsection (b) in a fiscal year shall certify to the Secretary that the agency will carry out the following responsibilities with respect to the facility in the fiscal year:

“(A) Establishing, managing, and supporting a performance monitoring, evaluation, and reporting program for the facility that provides for continuous monitoring, assessment, and reporting on the impacts that the vehicles may have on the operation of the facility and adjacent highways.

((B) Establishing, managing, and supporting an enforcement program that ensures that the facility is being operated in accordance with the requirements of this section.

((C) Limiting or discontinuing the use of the facility by the vehicles if the presence of the vehicles has degraded the operation of the facility.

((2) Degraded facility.--

((A) Definition of minimum average operating speed.--In this paragraph, the term 'minimum average operating speed' means--

((i) 45 miles per hour, in the case of a HOV facility with a speed limit of 50 miles per hour or greater; and

((ii) not more than 10 miles per hour below the speed limit, in the case of a HOV facility with a speed limit of less than 50 miles per hour.

((B) Standard for determining degraded facility.-- For purposes of paragraph (1), the operation of a HOV facility shall be considered to be degraded if vehicles operating on the facility are failing to maintain a minimum average operating speed 90 percent of the time over a consecutive 180-day period during morning or evening weekday peak hour periods (or both).

((C) Management of low emission and energy-efficient vehicles.--In managing the use of HOV lanes by low emission and energy-efficient vehicles that do not meet applicable occupancy requirements, a State agency may increase the percentages described in subsection (f)(3)(B)(i).

((e) Certification of Low Emission and Energy-Efficient Vehicles.--Not later than 180 days after the date of enactment of this section, the Administrator of the Environmental Protection Agency shall--

((1) issue a final rule establishing requirements for certification of vehicles as low emission and energy-efficient vehicles for purposes of this section and requirements for the labeling of the vehicles; and

((2) establish guidelines and procedures for making the vehicle comparisons and performance calculations described in subsection (f)(3)(B), in accordance with section 32908(b) of title 49.

((f) Definitions.--In this section, the following definitions apply:

((1) Alternative fuel vehicle.--The term 'alternative fuel vehicle' means a vehicle that is operating on--

((A) methanol, denatured ethanol, or other alcohols;

((B) a mixture containing at least 85 percent of methanol, denatured ethanol, and other alcohols by volume with gasoline or other fuels;

((C) natural gas;

((D) liquefied petroleum gas;

((E) hydrogen;

((F) coal derived liquid fuels;

((G) fuels (except alcohol) derived from biological materials;

((H) electricity (including electricity from solar energy); or

((I) any other fuel that the Secretary prescribes by regulation that is not substantially petroleum and that would yield substantial energy security and

environmental benefits, including fuels regulated under section 490 of title 10, Code of Federal Regulations (or successor regulations).

“(2) HOV facility.--The term ‘HOV facility’ means a high occupancy vehicle facility.

“(3) Low emission and energy-efficient vehicle.--The term ‘low emission and energy-efficient vehicle’ means a vehicle that--

“(A) has been certified by the Administrator as meeting the Tier II emission level established in regulations prescribed by the Administrator under section 202(i) of the Clean Air Act (42 U.S.C. 7521(i)) for that make and model year vehicle; and

“(B)(i) is certified by the Administrator of the Environmental Protection Agency, in consultation with the manufacturer, to have achieved not less than a 50-percent increase in city fuel economy or not less than a 25-percent increase in combined city-highway fuel economy (or such greater percentage of city or city-highway fuel economy as may be determined by a State under subsection (d)(2)(C)) relative to a comparable vehicle that is an internal combustion gasoline fueled vehicle (other than a vehicle that has propulsion energy from onboard hybrid sources); or

“(ii) is an alternative fuel vehicle.

“(4) Public transportation vehicle.--The term ‘public transportation vehicle’ means a vehicle that--

“(A) provides designated public transportation (as defined in section 221 of the Americans with Disabilities Act of 1990 (42 U.S.C. 12141) or provides public school transportation (to and from public or private primary, secondary, or tertiary schools); and

“(B)(i) is owned or operated by a public entity;

“(ii) is operated under a contract with a public entity; or

“(iii) is operated pursuant to a license by the Secretary or a State agency to provide motorbus or school vehicle transportation services to the public.

“(5) State agency.--

“(A) In general.--The term ‘State agency’, as used with respect to a HOV facility, means an agency of a State or local government having jurisdiction over the operation of the facility.

“(B) Inclusion.--The term ‘State agency’ includes a State transportation department.”.

(b) Conforming Amendments.--

(1) Program efficiencies.--Section 102 of title 23, United States Code, is amended--

(A) by striking subsection (a); and

(B) by redesignating subsections (b) and (c) as

subsections (a) and (b), respectively.

(2) Chapter analysis.--The analysis for such subchapter (as amended by section 1120 of this Act) is amended by adding at the end the following:

“166. HOV facilities.”.

(c) Sense of Congress.--It is the sense of Congress that the Secretary and the States should provide additional incentives (including the use of high occupancy vehicle lanes

on State and Interstate highways) for the purchase and use of hybrid and other fuel efficient vehicles, which have been proven to minimize air emissions and decrease consumption of fossil fuels.

APPENDIX B

A Summary of 23 U.S.C. 166 Requirements for Exceptions to Minimum Occupancy Requirements

States are provided flexibility in 23 U.S.C. 166 to maximize the throughput of HOV facilities by allowing exempted vehicles to use excess capacity. The information contained in this appendix summarizes the requirements found in 23 U.S.C. 166 for vehicles that do not meet the minimum occupancy requirement to use HOV lanes.

APPENDIX B: A SUMMARY OF 23 U.S.C 166 REQUIREMENTS FOR EXCEPTIONS TO MINIMUM OCCUPANCY REQUIREMENTS

	Motorcycles and Bicycles 23 U.S.C. 166(b)(2)	SOV Public Transportation Vehicles 23 U.S.C. 166(b)(3)	High Occupancy Toll Vehicles¹ 23 U.S.C. 166(b)(4)	Inherently Low Emission Vehicles 23 U.S.C. 166(b)(5)	Low Emission and Energy-Efficient Vehicles and Alternative Fuel Vehicles 23 U.S.C. 166(b)(5)
Access to HOV Facilities	Mandatory unless a State certifies to FHWA that these vehicles would create safety hazard.	Optional if excess capacity is available.	Optional if excess capacity is available.	Optional if excess capacity is available.	Optional if excess capacity is available.
Requirements for certifications before allowing exceptions to use HOV facilities	No. Only if a State wants to prohibit these vehicles to use HOV facilities due to safety hazards.	Optional but States are encouraged to work with local FHWA Division Offices in submitting certifications before allowing exceptions to use HOV facilities.	Optional but States are encouraged to work with local FHWA Division Offices in submitting certifications before allowing exceptions to use HOV facilities.	Optional but States are encouraged to work with local FHWA Division Offices in submitting certifications before allowing exceptions to use HOV facilities.	Optional but States are encouraged to work with local FHWA Division Offices in submitting certifications before allowing exceptions to use HOV facilities.
Required to submit annual certification	Optional	Optional	Yes	Yes	Yes
Requirements for performance monitoring	Optional	Optional	Yes	Yes	Yes
Requirements for enforcement	Optional	Yes	Yes	Yes	Yes

¹ Tolls may be charged on both Interstate and non-Interstate facilities.

APPENDIX B: A SUMMARY OF 23 U.S.C 166 REQUIREMENTS FOR EXCEPTIONS TO MINIMUM OCCUPANCY REQUIREMENTS

	Motorcycles and Bicycles 23 U.S.C. 166(b)(2)	SOV Public Transportation Vehicles 23 U.S.C. 166(b)(3)	High Occupancy Toll Vehicles¹ 23 U.S.C. 166(b)(4)	Inherently Low Emission Vehicles 23 U.S.C. 166(b)(5)	Low Emission and Energy-Efficient Vehicles and Alternative Fuel Vehicles 23 U.S.C. 166(b)(5)
Limit or discontinue the use of the HOV facility if the presence of these vehicles has degraded the operation of the facility	No	Optional	Yes, but in no particular order.	Yes, but in no particular order.	Yes, but in no particular order.
Requirements for labeling	No	Yes	Yes	Yes	Yes
Subject to be tolled	No	No. However, decision to implement 166(b)(3) is discretionary. If State implements HOT Lane under 166(b)(4), SOV public transportation vehicle may be tolled as a HOT vehicle.	Yes	Optional	Optional
Requirements for automatic toll collection	N/A	N/A	Yes	No	No
Toll agreement	N/A	N/A	Yes	Yes, unless no toll is charged.	Yes, unless no toll is charged.

APPENDIX B: A SUMMARY OF 23 U.S.C 166 REQUIREMENTS FOR EXCEPTIONS TO MINIMUM OCCUPANCY REQUIREMENTS

	Motorcycles and Bicycles 23 U.S.C. 166(b)(2)	SOV Public Transportation Vehicles 23 U.S.C. 166(b)(3)	High Occupancy Toll Vehicles¹ 23 U.S.C. 166(b)(4)	Inherently Low Emission Vehicles 23 U.S.C. 166(b)(5)	Low Emission and Energy-Efficient Vehicles and Alternative Fuel Vehicles 23 U.S.C. 166(b)(5)
Requirement to manage demand by varying toll amounts	N/A	N/A	Yes	No	No
Use of toll revenue	N/A	N/A	Debt Service, reasonable return on investment, operations and maintenance of toll facility.	Debt Service, reasonable return on investment, operations and maintenance of toll facility.	Debt Service, reasonable return on investment, operations and maintenance of toll facility.
Use of excess toll revenue	N/A	N/A	Must be eligible under Title 23 and give priority to projects for developing alternative to SOV travel and projects for improving highway safety.	Must be eligible under Title 23 and give priority to projects for developing alternative to SOV travel and projects for improving highway safety.	Must be eligible under Title 23 and give priority to projects for developing alternatives to SOV travel and projects for improving highway safety.

APPENDIX C

Section 166 Model Toll Agreement

No. ____ of _____
Executed
Original Counterparts

AGREEMENT

By and between the
FEDERAL HIGHWAY ADMINISTRATION,
UNITED STATES DEPARTMENT OF TRANSPORTATION
AND

_____ DEPARTMENT OF TRANSPORTATION

AND

(insert name of third party toll agency or municipality, if applicable)

THIS AGREEMENT, made and entered into this ____ day of _____ 2006, by and between the _____ DEPARTMENT OF TRANSPORTATION, an agency of the State of _____, (hereinafter referred to as “_____”), _____, a _____ of the State of _____, (hereinafter referred to as “_____”) and the FEDERAL HIGHWAY ADMINISTRATION, UNITED STATES DEPARTMENT OF TRANSPORTATION, (hereinafter referred to as “FHWA”) hereby provides as follows:

WITNESSETH:

WHEREAS, the _____ and the _____ desire to toll the high occupancy vehicle (“HOV”) lane/s on _____, which is located at _____ (hereinafter referred to as the “toll facility”); and

WHEREAS, Section 166(c) of Title 23, United States Code, as amended, permits tolls to be charged on HOV facilities, including HOV facilities on the Interstate System, to “High Occupancy Toll Vehicles” and “Low Emission and Energy-Efficient Vehicles” for their use of such facilities, subject to the requirements of Section 129 of Title 23, United States Code; and

WHEREAS, Paragraph 3 of Section 129(a) of Title 23, United States Code, as amended, restricts the use of revenues as follows:

(3) Limitation on Use of Revenues ... all toll revenues received from operation of the toll facility will be used first for debt service, for reasonable return on investment of any private person financing the project, and for the costs necessary for the proper operation and maintenance of the toll facility, including reconstruction, resurfacing,

restoration, and rehabilitation. If the State certifies annually that the tolled facility is being adequately maintained, the State may use any toll revenues in excess of amounts required under the preceding sentence for any purpose for which Federal funds may be obligated by a State under this title.

WHEREAS, Paragraph 3 of Section 166(c) of Title 23, United States Code, as amended, further restricts the use of revenues as follows:

(3) Excess Toll Revenues.—If a State agency makes a certification under Section 129(a)(3) of Title 23, United States Code, with respect to toll revenues collected under paragraphs (4) and (5) of [Section 166(b) of Title 23, United States Code,] the State, in the use of toll revenues under that sentence, shall give priority consideration to projects for developing alternatives to single occupancy vehicle travel and projects for improving highway safety.

NOW THEREFORE, the _____, the _____, and FHWA hereby agree as follows:

1. The FHWA agrees that _____ and _____ may charge toll on the toll facility in accordance with the provisions of this Agreement and Section 166 of Title 23, United States Code.

2. The _____ and the _____ agree that the toll revenues from the operation of the toll facility will be used first for debt service, for reasonable return on investment of any private person financing the project, and for the costs necessary for the proper operation and maintenance of the toll facility, including reconstruction, resurfacing, restoration, and rehabilitation, as provided in paragraph 3 of Section 129(a) of Title 23, United States Code, as amended.

3. In accordance with Sections 129(a) and 166(c) of Title 23, United States Code, as amended, the _____ and the _____ hereby certify that they can and will comply with the following requirements:

The _____ and the _____ agree to certify annually that the toll facility is being adequately maintained. Upon such certification, the _____ is entitled to use any toll revenues in excess of the amounts required under paragraph 3 of Section 129(a), as amended, for any purpose for which Federal funds may be obligated by a State under Title 23, United States Code, with priority given to projects for developing alternatives to single occupancy vehicle travel and projects for improving highway safety. One certification submitted by either party to the FHWA shall be sufficient to satisfy the requirements of this paragraph so long as both parties are bound by such certification.

4. The _____ and the _____ agree, upon reasonable notice, to make all its records pertaining to the toll facility subject to audit by the FHWA. The _____ and the _____ agree to annually audit the records of the toll facility

for compliance with the provisions of this agreement and report the results thereof to the FHWA. In lieu of the _____ and the _____ performing said audit, a report of an independent auditor furnished to the FHWA, the _____, and the _____ may satisfy the requirements of this section. Additionally, in the event that excess revenues are used for other Title 23, United States Code, eligible projects, the _____ and the _____ will certify that priority was given to projects for developing alternatives to single occupancy vehicle travel and projects for improving highway safety as part of the annual audit report to be submitted to the FHWA.

5. The _____ and _____ agree to be bound by and comply with the provisions of Section 166 of Title 23, United States Code, as amended, as well as all other applicable Federal laws, rules, and regulations.

6. That this Agreement will be prepared in triplicate originals so that each signatory will have an original Agreement.

IN WITNESS THEREOF, the parties hereto have caused this instrument to be duly executed, the day and year first written above.

STATE OF _____
_____ DEPARTMENT OF TRANSPORTATION

BY: _____,

(Insert Name of Toll Authority, if applicable)

BY: _____

FEDERAL HIGHWAY ADMINISTRATION
UNITED STATES DEPARTMENT OF TRANSPORTATION

BY: _____
Jeffrey F. Paniati
Executive Director