

Federal-Aid Highway Program Guidance on High Occupancy Vehicle (HOV) Lanes (November 2012)

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 biological materials; (8) electricity (including solar energy) or (9) 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.

Auxiliary Lane – FHWA deems this term to have the same meaning as in the American Association of State Highways and Transportation Officials (AASHTO) Policy on Geometric Design of Highways and Streets, 2001 (commonly, the “Green Book”) as the portion of roadway adjoining the traveled way, and designated for speed change, turning, storage for turning, weaving, truck climbing, and other purposes supplementary to through-traffic movement.

Express Lane – One has to be careful how and when to apply this term, for it can either be a mandated legend on a highway sign (e.g., a “shall” condition for priced managed lanes per the MUTCD, reference section 2G.16) or may be a catch-all euphemistic label of any lane(s) intended to provide “express” service, such as a limited access facility, e.g., a busway or similar. In the former case, the MUTCD specifically does not exhibit examples of “HOT Lane” signing. They only exhibit “HOV Lane” signs or “Express Lane” signs. The MUTCD states that priced managed lanes (MLs) that are adjacent to G-P lanes along the same designated route shall be signed using the legend EXPRESS or EXPRESS LANE(S). This applies when: a) the lane(s) charge a fixed or variable toll to all users; b) G-P traffic using the ML is charged a fixed or variable toll, but the HOV traffic thereon is not charged; c) G-P traffic using the ML is charged a fixed or variable toll, but HOV traffic thereon is offered a discounted toll on either a F-T or P-T basis; d) G-P traffic using the ML is charged a fixed or variable toll, but HOV traffic thereon is registered with a local program and travels at a discounted toll or no toll on either a F-T or P-T basis (a transponder is typically utilized herein). The legends EXPRESS and EXPRESS LANE(S) shall not be used on signs for entrances to highways on which all lanes are managed and there are no adjacent G-P lanes on the same designated route. See the MUTCD section 2G for more information.

High Occupancy Vehicle (HOV) – Federal law defines a “high occupancy vehicle” or “HOV” to mean a vehicle with no fewer than two persons..

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. Note: while the term "HOT lane" endures, qualifying priced managed lanes* shall be signed as "EXPRESS or EXPRESS LANES(S) per the MUTCD section 2G. *see definition above for "Express Lane" for more discussion.

HOV facility – "High Occupancy Vehicle" facility; One that gives priority treatment to buses, vanpools, carpools and high-occupancy vehicles, including the HOV lanes, the 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.

Initial Construction – Federal law defines "initial construction" as the construction of a highway, bridge, tunnel, or other facility before it is open to traffic. Conversely, and intentionally, the definition excludes any improvement to a highway, bridge, tunnel or other facility after it is open to traffic.

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 (42 U.S.C. 7521 (i)) 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; or is an alternative fuel vehicle.

Managed Lanes – Managed lanes are defined as highway facilities or a set of lanes where operational strategies are proactively implemented and managed in response to changing conditions. Typically these fall into one of three categories; pricing (e.g., HOT lanes and tolling), vehicle eligibility (e.g., HOV, bus-only, or trucks only), or access control (e.g., express lanes or reversible lanes). The "proactive" element of this definition implies that one or more of the categories is dynamically changed several times per day in response to changing conditions thereon the facility. For example, the use of the lane is "managed" by changing the price, or opening

or closing ramps, or switching the direction of travel thereon, or allowing only certain exempt vehicles, usually in response to peak and non-peak conditions.

Occupancy requirement - Any restriction that specifies a minimum number of persons in a vehicle. For example, HOV lanes are often 2+ (the driver plus one or more passengers) or 3+ (the driver plus two or more passengers) to use that lane. For purposes of this definition, fetuses in the womb do not constitute an occupant in the vehicle.

Public Authority – Federal law defines “public authority” as a State, interstate compact of States, or public entity designated by a State.

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 (42 U.S.C. 12141) 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 agency entity; or is operated under a contract with a public agency 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. For purposes of HOV and HOT travel, this would include said vehicles that are deadheading (i.e., no passengers, only a driver) and would not otherwise be subject to occupancy minimums.

Reconstruction – major work necessary to bring a facility up to (i.e., to improve to) an acceptable level of service. Such work may include, but is not limited to, the replacement of the pavement structural section, modernization of interchanges, adding interchanges, upgrading structural safety features, replacement of bridge decks and bridge parapets, adjustments to vertical and horizontal alignment, adding full-width and/ or full-depth shoulders, grade separations, and strengthening bridges to accommodate greater loads.

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.

Toll Facility – Federal law defines “toll facility” as a toll highway, bridge, or tunnel, or approaches to same, that are constructed under 23 U.S.C. 129(a).

Chapter I Introduction

This program guidance, which applies to all federally funded high occupancy vehicle (HOV) facilities, supersedes the previous version issued in August 2008. The revisions are made based on the requirements set forth in the legislation H.R. 4248 “Moving Ahead for Progress in the 21st Century” also known as “MAP-21”, signed into law by President Barack Obama on July 6, 2012.

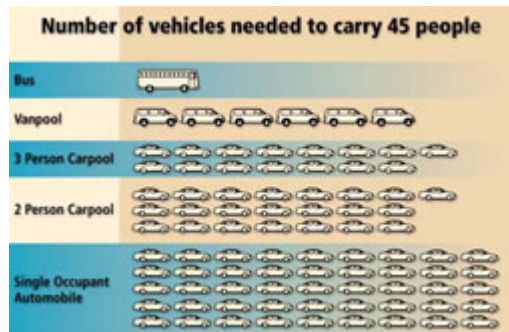


(Picture showing a 2-lane dedicated HOV facility in the median of a highway.)

The purpose of this document is to provide information useful to States as they plan, design, operate, and manage HOV and HOT 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



(Graphic showing that one bus, or six vanpools, or 15 3+ carpools, or 22 2+ carpools, or 45 single-occupant vehicles, are necessary to transport 45 people)

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. (Note: hereafter, the term “HOV lane” is intended to cover both HOV and HOT situations, primarily due to the fact that HOT lanes inherently include an element of HOV use for qualifying vehicles. The term “HOT lane” may be called out for particular emphasis when the specific description of that facility is necessary.) 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, carpools, vanpoolers, transit users, and single-occupant users paying to use HOT lanes, are the direct beneficiaries of HOV and HOT lanes, whereas, motorists and passengers in the adjacent general purpose lanes are indirect beneficiaries, due to the reduction of vehicles in those lanes necessary to move said motorists and passengers in the 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.

HOT Facilities in the U.S.

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 choice 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.

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.



(Picture of MnPass facility in Minnesota stating “Car pools, buses and motorcycles (are) Free” while displaying toll rates for non-exempt vehicles.)

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 150 freeway HOV facilities and/or HOT facilities that allow HOVs in metropolitan areas in the U.S.

Congestion is recognized to be a growing problem, particularly 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.



(Picture showing “FastTrak” toll of \$1.50, and indicating a “no cash” (i.e., all electronic) collection method)

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.

Many of the HOT lanes implemented in the U.S. were piloted under the Value Pricing Pilot Program (VPPP). Prior to the passage of MAP-21's precursor, 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. This concept continues in MAP-21, wherein, 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

Sections 1512 ("Tolling") and 1514 ("HOV Facilities") are the two sections of MAP-21 that address HOT and HOV lanes, respectively. One other section that has some tangential relationship to this subject is Section 1513 ("Miscellaneous Parking Amendments") which alludes to the accommodation of Federal-aid funding to acquire qualifying lands, and pay for qualifying projects that locate and build electric vehicle charging stations or natural gas vehicle refueling stations. The MAP-21 amendments that are relevant to this issue are 23 U.S.C. Section 137(f) and (g), Section 142 (a), and Section 205 (d), which allow for said charging station-Federal reimbursement for "fringe parking" areas, "public transportation-related" areas, and "forest development roads and trail" areas, respectively. The reader is directed to those sections for exact language and guidance.

Specific to HOV/T lanes, what MAP-21 does is to amend portions of U.S. Code Title 23, which outlines the roles of highways in the United States. In the case of 1512, it amends Section 129 ("Toll Roads, Bridges, Tunnels and Ferries") whereas, 1514 amends Section 166 ("HOV Facilities").

Section 1512 of MAP-21 amends Section 129(a) of 23 U.S.C. to define options for operating HOV facilities. Sections 129(b) and 129(c) were not amended; regardless, both of those sections deal with ferries and ferry terminal facilities, and are less relevant to this document hereafter. States have 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 full recitation of as-amended Section 166 of 23 U.S.C. is provided in Appendix A. A full recitation of as-amended Section 129 of 23 U.S.C. is provided in Appendix B.

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

The 2+ vehicle occupancy requirement remains unchanged from SAFETY-LU. 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.

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, if allowed, may not be tolled.

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

MAP-21 gives 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, MAP-21 provides that States may restrict motorcycle and/or bicycle operations on HOV facilities “if the agency certifies . . . that such use would create a safety hazard.” Generally speaking, most all states have restricted bicycles from HOV/T lanes and some have restricted motorcycles. Check with your state’s specific HOV/T rules. Each of the other 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.

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

A HOT vehicle is any non-exempt vehicle that is charged a toll to use an HOV facility. By default, a HOT vehicle is almost always a SOV, since any vehicle having 2+ persons (or 3+ on some facilities) would qualify as an HOV. Depending on each State’s laws, the qualifying HOV may or may not have to have a transponder, etc., to be recognized as such. 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.

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 energy-efficient vehicles. Until September 30, 2017, 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. If a toll is charged, it must be less than or equal to that which is charged to qualifying vehicles under paragraph (4). After September 30, 2017, the States must discontinue use of ILEVs, et al, in their HOV lanes unless Congress either extends MAP-21, or supersedes it with a new highway funding bill.

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 is responsible to issue a final rule that establishes the certification and labeling requirements for low emission and energy-efficient vehicles.

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. Per Section 166 (b)(3) 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.

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

In general, a State agency that allows vehicles to use an HOV facility under paragraph (4) “HOT vehicles” or (5) “ILEVs, et al” 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 the subject vehicles or increasing the price paid by non-exempt vehicles for access to HOV lanes.

Facility degradation is defined in Section 166(d)(2) as one that does not meet minimum average operating speed of 45 MPH for 90 percent of the time over a 180-day monitoring period during morning and evening weekday peak hours (or both), in the case of a HOV

facility with a speed limit of 50 MPH or greater, or not more than 10 MPH below the speed limit in the case of a facility with a speed limit of less than 50 MPH.

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.

Beginning with MAP-21, Sections 166(d)(D) and (E) were adopted. Section (d)(D) prescribes that the State has 180 days following notice of degradation to “bring the facility into compliance with the minimum average operating speed performance standard through changes to operation of the facility, including” (1) increasing the occupancy requirement for HOV lanes; (2) varying the toll charged to vehicles under subsection (b); (3) discontinuing allowing non-HOV vehicles to use the HOV lanes under subsection (b); or, (4) increasing the available capacity of the HOV facility. Section (d)(E) prescribes penalty, such that if the state fails to bring a facility into compliance under (D), then the Secretary shall subject the State to appropriate program sanctions under Section 1.36 of Title 23 (or successor) until the performance is no longer degraded. For the record, that section reads as follows: *If the Administrator determines that a State has violated or failed to comply with the Federal laws or the regulations in this part with respect to a project, he may withhold payment to the State of Federal funds on account of such project, withhold approval of further projects in the State, and take such other action that he deems appropriate under the circumstances, until compliance or remedial action has been accomplished by the State to the satisfaction of the Administrator.*

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.

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.

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.

Be advised that 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 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.

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 efficient 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

Implementation Process for Significant Operational Change

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.

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>.

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.

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 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.

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

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 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



(Picture showing a generic highway patrol vehicle)

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

Much of the legislation pertaining to tolling is included in MAP-21 Section 1512 “Tolling”, which amends Section 129 of Title 23 U.S.C. MAP-21 has removed the requirement for an agreement to be executed with the U.S. DOT prior to tolling under mainstream tolling programs, though such agreements will still be required under any toll pilot programs. Specifically, the tolling of new Interstates and added lanes on existing Interstates are now mainstreamed; previously these conditions existed under the *Interstate System Construction Toll Pilot Program* and the *Express Lanes Demonstration Program*, both of which no longer exist. The *Value Pricing Pilot Program*, which allows congestion pricing, is continued (but without discretionary grants), as is the *Interstate System Reconstruction and Rehabilitation Pilot Program*, which allows tolling of all lanes on an existing Interstate highway when required for reconstruction or rehabilitation. A new Section 129 (a)(9) allows that if a State does not have a highway, bridge, or tunnel toll

facility as of the date of enactment of MAP-21 (i.e., July 6, 2012) then before commencing any activity authorized by MAP-21 the State shall have in effect a law that permits tolling on a highway, bridge, or tunnel.

Federal participation for toll-related projects “shall be permitted on the same basis and in the same manner as construction of toll-free highways” for: (A) initial construction of a toll highway, bridge, or tunnel (hereafter “toll HBT”) or approach to the toll HBT; (B) initial construction of one or more lanes or other improvements that increase capacity of a toll HBT (other than a highway on the Interstate System) and conversion of that toll HBT to a tolled facility, if the number of toll-free lanes, excluding auxiliary lanes, after construction is not less than . . . before construction; (C) initial construction of one or more lanes or other improvements that increase the capacity of a toll HBT on the Interstate System and conversion of that toll HBT to a tolled facility, if the number of toll-free non-HOV lanes, excluding auxiliary lanes, after such construction is not less than . . . before construction; (D) reconstruction, resurfacing, restoration, rehabilitation, or replacement of a toll HBT or approach to the toll HBT; (E) reconstruction or replacement of a toll-free bridge or tunnel and conversion (of same) to a toll facility; (F) reconstruction of a toll-free Federal-aid highway (other than a highway on the Interstate System) and conversion (of same) to a toll facility; (G) reconstruction, restoration, or rehabilitation of a highway on the Interstate System if the number of toll-free non-HOV lanes, excluding auxiliary lanes, after reconstruction, restoration, or rehabilitation is not less than . . . before construction; (H) conversion of a high occupancy vehicle lane on a non-toll HBT to a toll facility; and (I) preliminary studies to determine the feasibility of a toll facility for which Federal participation is authorized under this paragraph.

Specific to the requirement of agreements on mainstreamed programs being lifted, Section 129 (a)(4) now exists and states that public authorities having jurisdiction over a HOV facility on the Interstate System may undertake reconstruction, restoration, or rehabilitation under paragraph (1)(G) –see above—and may levy tolls if: (i) (in an MPO) they submit to the Secretary a written assurance that the MPO has been consulted concerning the placement and amount of tolls; (ii) they develop, manage and maintain a system that will automatically collect the toll; (iii) they establish policies and procedures (a) to manage the demand by varying the toll charged, and (b) to enforce sanctions for violations of use of that facility.

Other sections of Section 129, amended, speak to the allowable use of toll revenue, limits of Federal share of the costs of construction, et al, and loans. As these items have legal and functional requirements, the reader is directed to peruse the actual legislation and/or contact the FHWA State division office for precise detail and interpretation.

The general rule to follow is that in the event that a toll agreement is required, States should first 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.

If toll agreements are necessary to be executed, the State Transportation Department should sign at least two counterpart originals of said toll agreement. If another public authority or private entity will also have jurisdiction over the facility, then they too should sign the original agreements. Once all the original agreements have been signed, the State should transmit the hardcopy 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.

Interoperability

Section 1512(b) of MAP-21 requires that all Federal-aid highway toll facilities implement technologies or business practices that provide for the interoperability of electronic toll collection “not later than 4 years after the date of (MAP-21)” therefore, the effective due date for this item is October 1, 2016. FHWA staff is currently working to develop guidelines and, if needed, legislation to define said technologies. (Note: this is not an amendment to Section 129, 23 Title U.S.C., per se, but rather a direct inclusion to MAP-21.)

Discussion on Decision to Toll

The decision to toll as part of a project that qualifies as “initial construction” may occur anytime up until the point that the facility is open to traffic. In order to be deemed as having made a decision to toll, toll collection must be operational or actively becoming operational when the facility is opened. Toll collection is considered to be actively becoming operational if, when the facility is opened to traffic, the decision to toll is reflected in the applicable environmental document and toll collection equipment has been, or is scheduled to be, installed. If a segment of the overall facility being constructed is open to traffic as a free facility prior to having made the decision to toll, then that portion may not be tolled; however, other segments that have not yet opened to traffic still qualify for tolling as “initial construction.”

The decision to toll as part of a “reconstruction” project may occur anytime up until the completion of all work under the contract for the physical construction of the project. If the physical construction of the location to be tolled is to be conducted under multiple

contracts, then the decision to toll may occur anytime up until the completion of the final contract comprising the reconstruction activities. In order to be deemed as having made a decision to toll, toll collection must be operational or actively becoming operational when reconstruction activities are complete. Toll collection is considered to be actively becoming operational if, when the reconstruction activities are complete, the decision to toll is reflected in the applicable environmental document and toll collection equipment has been, or is scheduled to be, installed. If the work under the reconstruction contract is completed prior to the State DOT or other public authority making the decision to toll, then the location will not be eligible for tolling until a contract for another reconstruction project is awarded.

The decision to toll lanes that are added to any existing free facility through initial construction, reconstruction, rehabilitation, or restoration, so long as the facility has the same number of free lanes after construction as it did before, may occur any time up until the new lanes are open to traffic. In order to be deemed as having made a decision to toll, toll collection must be operational or actively becoming operational when the facility is opened. Toll collection is considered to be actively becoming operational if, when the facility is opened to traffic, the decision to toll is reflected in the applicable environmental document and toll collection equipment has been, or is scheduled to be, installed. If a segment of the overall facility being constructed is open to traffic as a free facility prior to having made the decision to toll, then that portion may not be tolled; however, other segments that have not yet opened to traffic still qualify for tolling. Once the lanes are open to traffic, then the new lanes become part of the free facility and will not be eligible for tolling as part of the project to add new lanes.

Discussion of Toll Rates

Decisions regarding the amount of toll rates are to be made solely by the State DOT or other qualified public authority. These decisions require no review, input or oversight by the FHWA. While Federal law 33 U.S.C. 508 requires that toll rates for *bridges* constructed under the authority of the General Bridge Acts of 1906 and 1946, and the International Bridge Act of 1972, be “just and reasonable”, the FHWA has no authority to review or to determine whether any such toll rate is just and reasonable. That determination (i.e., just and reasonable) is at the discretion of the State DOT or other public authority.

However, as described elsewhere, with respect to HOT lanes, the tolls charged thereon must vary in order to manage the demand of the lane. The amount of the toll rate, though, is solely at the discretion of the State DOT or other public authority. Also, tolls on HOT lanes may not be charged to vehicles meeting the minimum occupancy threshold established for the HOV-element of the facility.

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 choice to drivers.

MAP-21 Section 1514 amends 23 U.S.C. Section 166 to provide 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 an HOV lane is converted to a HOT lane, allowing vehicles that do not meet the established minimum occupancy requirement to use the HOV lane on payment of a toll. The “trade off” benefit to paying to use an HOV lane is an increase in trip reliability, as the HOV lane is required to be monitored for compliance to maintain speeds. In theory, the HOV lane-user will proceed at a fairly uninterrupted pace while the adjacent general-purpose lanes may clog during peak hours. Outside of peak hours, the G-P lanes may clear and a tolled trip in the HOV lane may be unnecessary.



(Picture showing the left lane is for free HOV 2+ and the right lane is for tolled traffic.)

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.



(Picture displaying overhead sign reading “Express Lanes Carpools Only Second Exit”)

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 per each of the section 166(b) and (c) provisions. If the State cannot fully implement these provisions within the stipulated time, then the State's toll authority may be revoked.

Despite their potential benefits, HOT lanes are often portrayed as "Lexus Lanes" in the media. The contention is that only higher income drivers (i.e., only ones that can afford Toyota Lexus-priced vehicles) can take advantage of these facilities, while lower income drivers must continue to be stuck in traffic. In the 2007 Economic Report of the President, one study found that drivers with higher incomes may indeed tend to use HOT lanes more often than lower income drivers, but that lower income drivers certainly rely on toll lanes when on-time arrival at their destination is important. Other more recent surveys found that support for, or opposition to, HOT lanes is more related to time savings, and less related to income. It is the position of the U.S. DOT that HOT lanes provide direct choices and direct benefits to the subject users, and indirect benefits to non-users, e.g., by removing vehicles from the G-P lanes and using excess capacity in the HOV lanes

The HOV/T goal is to encourage the use of carpooling, vanpooling, and transit services, and to allow toll-paying customers to fill excess capacity and enjoy a more reliable trip, all without overloading the capacity of the HOV lane.

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.



(Picture displaying a sign reading “HOVs – 3+ Restriction Now In Effect on 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.

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

Hybrid Vehicles Pilot Programs

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.



(Picture of car with “Clean Pass Vehicle” sticker on the bumper.)

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. The concept is that this benefit (i.e., free travel in HOV lanes) may stir buyers to purchase environmentally friendly vehicles. However, it is assumed that over time “eco” vehicles may become more common. As stated elsewhere, this benefit may be sunset as of October 1, 2016, unless it is extended or continued by Congress. 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/about/field.cfm>
- FHWA Office of Transportation Management: <http://www.ops.fhwa.dot.gov/freewaymgmt/hov/index.htm>
- FTA Regional Offices: <http://www.fta.dot.gov/12926.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 HOV-related 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.

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

The following excerpt is Section 166 of Title 23 U.S.C. inclusive of the amendments (deletions, insertions and additions) prescribed by MAP-21 Section 1514 “HOV FACILITIES”.

§166 23 U.S.C. -- 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, 2017, 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, 2017, 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 this paragraph, a State agency may charge no toll or may charge a toll that is less than or equal to tolls charged under paragraph (4).

(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) TOLL REVENUE.—Toll revenue collected under this section is subject to the requirements of section 129(a)(3).

(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) shall submit to the Secretary a report demonstrating that the facility is not already degraded, and that the presence of the vehicles will not cause the facility to become degraded, and certify to the Secretary that the agency will carry out the following responsibilities with respect to the facility:

(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 and submitting to the Secretary annual reports of those impacts.

(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 whenever the operation of the facility is degraded.

(D) MAINTENANCE OF OPERATING PERFORMANCE.—Not later than 180 days after the date on which a facility is degraded pursuant to the standard specified in paragraph (2), the State agency with jurisdiction over the facility shall bring the facility into compliance with the minimum average operating speed performance standard through changes to operation of the facility, including—

(i) increasing the occupancy requirement for HOV lanes;

(ii) varying the toll charged to vehicles allowed under subsection (b) to reduce demand;

(iii) discontinuing allowing non-HOV vehicles to use HOV lanes under subsection (b); or

(iv) increasing the available capacity of the HOV facility.

(E) COMPLIANCE.—If the State fails to bring a facility into compliance under subparagraph (D), the Secretary shall subject the State to appropriate program sanctions under section 1.36 of title 23, Code of Federal Regulations (or successor regulations), until the performance is no longer degraded.

(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.

Appendix B

The following excerpt is Section 129 of Title 23 U.S.C. inclusive of the amendments (deletions, insertions and additions) prescribed by MAP-21 Section 1512 “TOLLING”.

§129 23 U.S.C.. -- Toll roads, bridges, tunnels, and ferries

(a) Basic Program.—

(1) Authorization for federal participation.— Subject to the provisions of this section, Federal participation shall be permitted on the same basis and in the same manner as construction of toll-free highways is permitted under this chapter in the—

(A) initial construction of a toll highway, bridge, or tunnel or approach to the highway, bridge, or tunnel;

(B) initial construction of 1 or more lanes or other improvements that increase capacity of a highway, bridge, or tunnel (other than a highway on the Interstate System) and conversion of that highway, bridge, or tunnel to a tolled facility, if the number of toll-free lanes, excluding auxiliary lanes, after the construction is not less than the number of toll-free lanes, excluding auxiliary lanes, before the construction;

(C) initial construction of 1 or more lanes or other improvements that increase the capacity of a highway, bridge, or tunnel on the Interstate System and conversion of that highway, bridge, or tunnel to a tolled facility, if the number of toll-free non-HOV lanes, excluding auxiliary lanes, after such construction is not less than the number of toll-free non-HOV lanes, excluding auxiliary lanes, before such construction;

(D) reconstruction, resurfacing, restoration, rehabilitation, or replacement of a toll highway, bridge, or tunnel or approach to the highway, bridge, or tunnel;

(E) reconstruction or replacement of a toll-free bridge or tunnel and conversion of the bridge or tunnel to a toll facility;

(F) reconstruction of a toll-free Federal-aid highway (other than a highway on the Interstate System) and conversion of the highway to a toll facility;

(G) reconstruction, restoration, or rehabilitation of a highway on the Interstate System if the number of toll-free non-HOV lanes, excluding auxiliary lanes, after reconstruction, restoration, or rehabilitation is not less than the number of toll-free non-HOV lanes, excluding auxiliary lanes, before reconstruction, restoration, or rehabilitation;

(H) conversion of a high occupancy vehicle lane on a highway, bridge, or tunnel to a toll facility; and

(I) preliminary studies to determine the feasibility of a toll facility for which Federal participation is authorized under this paragraph;

(2) Ownership.—Each highway, bridge, tunnel, or approach to the highway, bridge, or tunnel constructed under this subsection shall—

(A) be publicly owned, or

(B) be privately owned if the public authority with jurisdiction over the highway, bridge, tunnel, or approach has entered into a contract with one or more private persons to design, finance, construct, and operate the facility and the public authority will be responsible for complying with all applicable requirements of this title with respect to the facility.

(3) Limitations on use of revenues.—

(A) IN GENERAL.—A public authority with jurisdiction over a toll facility shall use all toll revenues received from operation of the toll facility only for—

(i) debt service with respect to the projects on or for which the tolls are authorized, including funding of reasonable reserves and debt service on refinancing;

(ii) a reasonable return on investment of any private person financing the project, as determined by the State or interstate compact of States concerned;

(iii) any costs necessary for the improvement and proper operation and maintenance of the toll facility, including reconstruction, resurfacing, restoration, and rehabilitation;

(iv) if the toll facility is subject to a public-private partnership agreement, payments that the party holding the right to toll revenues owes to the other party under the public-private partnership agreement; and

(v) if the public authority certifies annually that the tolled facility is being adequately maintained, any other purpose for which Federal funds may be obligated by a State under this title.

(B) ANNUAL AUDIT.—

(i) IN GENERAL.—A public authority with jurisdiction over a toll facility shall conduct or have an independent auditor conduct an annual audit of toll facility records to verify adequate maintenance and compliance with subparagraph (A), and report the results of the audits to the Secretary.

(ii) RECORDS.—On reasonable notice, the public authority shall make all records of the public authority pertaining to the toll facility available for audit by the Secretary.

(C) NONCOMPLIANCE.—If the Secretary concludes that a public authority has not complied with the limitations on the use of revenues described in subparagraph (A), the Secretary may require the public authority to discontinue collecting tolls until an agreement with the Secretary is reached to achieve compliance with the limitation on the use of revenues described in subparagraph (A).

(4) LIMITATIONS ON CONVERSION OF HIGH OCCUPANCY VEHICLE FACILITIES ON INTERSTATE SYSTEM.—

(A) IN GENERAL.—A public authority with jurisdiction over a high occupancy vehicle facility on the Interstate System may undertake reconstruction, restoration, or rehabilitation under paragraph (1)(G) on the facility, and may levy tolls on vehicles, excluding high occupancy vehicles, using the reconstructed, restored, or rehabilitated facility, if the public authority—

(i) in the case of a high occupancy vehicle facility that affects a metropolitan area, submits to the Secretary a written assurance that the metropolitan planning organization designated under section 5203 of title 49 for the area has been consulted concerning the placement and amount of tolls on the converted facility;

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

(iii) establishes policies and procedures—

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

(II) to enforce sanctions for violations of use of the facility.

(B) EXEMPTION FROM TOLLS.—In levying tolls on a facility under subparagraph (A), a public authority may designate classes of vehicles that are exempt from the tolls or charge different toll rates for different classes of vehicles.

(5) Special rule for funding.—

(A) IN GENERAL.—In the case of a toll facility under the jurisdiction of a public authority of a State (other than the State transportation department), on request of the State transportation department and subject to such terms and conditions as the department and public authority may agree, the Secretary, working through the State department of transportation, shall reimburse the public authority for the Federal share of the costs of construction of the project carried out on the toll facility under this subsection in the same manner and to the same extent as the department would be reimbursed if the project was being carried out by the department.

(B) SOURCE.—The reimbursement of funds under this paragraph shall be from sums apportioned to the State under this chapter and available for obligations on projects on the Federal-aid system in the State on which the project is being carried out.

(6) Limitation on federal share.—The Federal share payable for a project described in paragraph (1) shall be a percentage determined by the State but not to exceed 80 percent.

(7) Modifications.—If a public authority (including a State transportation department) with jurisdiction over a toll facility subject to an agreement under this section or section 119(e), as in effect on the day before the effective date of title I of the Intermodal Surface Transportation Efficiency Act of 1991(105 Stat. 1915), requests modification of the agreement, the Secretary shall modify the agreement to allow the continuation of tolls in accordance with paragraph (3) without repayment of Federal funds.

(8) Loans.—

(A) In general.—

(i) LOANS.—Using amounts made available under this title, a State may loan to a public or private entity constructing or proposing to construct under this section a toll facility or non-toll facility with a dedicated revenue source an amount equal to all or part of the Federal share of the cost of the project if the project has a revenue source specifically dedicated to the project.

(ii) DEDICATED REVENUE SOURCES.—Dedicated revenue sources for non-toll facilities include excise taxes, sales taxes, motor vehicle use fees, tax on real property, tax increment financing, and such other dedicated revenue sources as the Secretary determines appropriate.

(B) Compliance with federal laws.—As a condition of receiving a loan under this paragraph, the public or private entity that receives the loan shall ensure that the project will be carried out in accordance with this title and any other applicable Federal law, including any applicable provision of a Federal environmental law.

(C) Subordination of debt.—The amount of any loan received for a project under this paragraph may be subordinated to any other debt financing for the project.

(D) Obligation of funds loaned.—Funds loaned under this paragraph may only be obligated for projects under this paragraph.

(E) Repayment.—The repayment of a loan made under this paragraph shall commence not later than 5 years after date on which the facility that is the subject of the loan is open to traffic.

(F) Term of loan.—The term of a loan made under this paragraph shall not exceed 30 years from the date on which the loan funds are obligated.

(G) Interest.—A loan made under this paragraph shall bear interest at or below market interest rates, as determined by the State, to make the project that is the subject of the loan feasible.

(H) Reuse of funds.—Amounts repaid to a State from a loan made under this paragraph may be obligated—

(i) for any purpose for which the loan funds were available under this title; and

(ii) for the purchase of insurance or for use as a capital reserve for other forms of credit enhancement for project debt in order to improve credit market access or to lower interest rates for projects eligible for assistance under this title.

(I) Guidelines.—The Secretary shall establish procedures and guidelines for making loans under this paragraph.

(9) STATE LAW PERMITTING TOLLING.—If a State does not have a highway, bridge, or tunnel toll facility as of the date of enactment of the MAP–21, before commencing any activity authorized under this section, the State shall have in effect a law that permits tolling on a highway, bridge, or tunnel.

(10) DEFINITIONS.—In this subsection, the following definitions apply:

(A) HIGH OCCUPANCY VEHICLE; HOV.—The term ‘high occupancy vehicle’ or ‘HOV’ means a vehicle with not fewer than 2 occupants.

(B) INITIAL CONSTRUCTION.—

(i) IN GENERAL.—The term ‘initial construction’ means the construction of a highway, bridge, tunnel, or other facility at any time before it is open to traffic.

(ii) EXCLUSIONS.—The term ‘initial construction’ does not include any improvement to a highway, bridge, tunnel, or other facility after it is open to traffic.

(C) PUBLIC AUTHORITY.—The term ‘public authority’ means a State, interstate compact of States, or public entity designated by a State.

(D) TOLL FACILITY.—The term ‘toll facility’ means a toll highway, bridge, or tunnel or approach to the highway, bridge, or tunnel constructed under this subsection.

(b) Notwithstanding the provisions of section 301 of this title, the Secretary may permit Federal participation under this title in the construction of a project constituting an approach to a ferry, whether toll or free, the route of which is a public road and has not been designated as a route on the Interstate System. Such ferry may be either publicly or privately owned and operated, but the operating authority and the amount of fares charged for passage shall be under the control of a State agency or official, and all

revenues derived from publicly owned or operated ferries shall be applied to payment of the cost of construction or acquisition thereof, including debt service, and to actual and necessary costs of operation, maintenance, repair, and replacement.

(c) Notwithstanding section 301 of this title, the Secretary may permit Federal participation under this title in the construction of ferry boats and ferry terminal facilities, whether toll or free, subject to the following conditions:

(1) It is not feasible to build a bridge, tunnel, combination thereof, or other normal highway structure in lieu of the use of such ferry.

(2) The operation of the ferry shall be on a route classified as a public road within the State and which has not been designated as a route on the Interstate System. Projects under this subsection may be eligible for both ferry boats carrying cars and passengers and ferry boats carrying passengers only.

(3) Such ferry boat or ferry terminal facility shall be publicly owned or operated or majority publicly owned if the Secretary determines with respect to a majority publicly owned ferry or ferry terminal facility that such ferry boat or ferry terminal facility provides substantial public benefits.

(4) The operating authority and the amount of fares charged for passage on such ferry shall be under the control of the State or other public entity, and all revenues derived therefrom shall be applied to actual and necessary costs of operation, maintenance, and repair, debt service, negotiated management fees, and, in the case of a privately operated toll ferry, for a reasonable rate of return.

(5) Such ferry may be operated only within the State (including the islands which comprise the State of Hawaii and the islands which comprise any territory of the United States) or between adjoining States or between a point in a State and a point in the Dominion of Canada. Except with respect to operations between the islands which comprise the State of Hawaii, operations between the islands which comprise any territory of the United States, operations between a point in a State and a point in the Dominion of Canada, and operations between any two points in Alaska and between Alaska and Washington, including stops at appropriate points in the Dominion of Canada, no part of such ferry operation shall be in any foreign or international waters.

(6) No such ferry shall be sold, leased, or otherwise disposed of without the approval of the Secretary. The Federal share of any proceeds from such a disposition shall be credited to the unprogrammed balance of Federal-aid highway funds of the same class

last apportioned to such State. Any amount so credited shall be in addition to all other funds then apportioned to such State and available for expenditure in accordance with the provisions of this title.