

Frequently Asked Questions about HOV-Lane Enforcement

This document provides the answers to frequently asked questions about the role of enforcement in planning, designing and operating high-occupancy vehicle (HOV) facilities. Questions regarding high-occupancy toll (HOT)-facility enforcement, exempt vehicles, and enforcement technologies are also addressed. The document was prepared as part of the HOV Pooled Fund Study project, which included development of the *HOV-Lane Enforcement Handbook*. The following questions and answers are targeted to a range of audiences, such as the public, media, community leaders, as well as transportation professionals.

1) What is HOV Lane Enforcement?

Enforcement is a critical element to the successful operation of an HOV facility. The purpose of an HOV enforcement program is to ensure that operating requirements, including vehicle-occupancy levels, are maintained to protect HOV travel-time savings, to discourage unauthorized vehicles, and to maintain a safe operating environment. Visible and effective enforcement promotes fairness and maintains the integrity of the HOV facility to help gain acceptance of the project among users and non-users.

2) Why are HOV lane enforcement programs important?

Enforcement policies and programs perform a number of important roles. The development of enforcement policies and programs will help ensure that all of the appropriate agencies are involved in the process and that all groups have a common understanding of the project and the need for enforcement. The enforcement process encompasses not only the detection and on-site ticketing of violators but a continuum that extends through adjudication of citations via the court system. Policies, legislation, procedures and agreements with the affected enforcement agencies need to be in place, and enforcement agencies have to be stakeholders in decisions that influence design, operation and performance monitoring activities. This same information can be provided to the public, especially travelers in the corridor, to help introduce the HOV facilities and to communicate the guidelines for use of the lanes.

3) Who enforces the HOV lanes?

The authorization and allocation of powers for enforcement of freeway HOV facilities is handled through a combination of state regulations and local ordinances, so long as those laws do not conflict with any federal regulations governing the operation of federal-aid highways. Most commonly, such legislation designates primary responsibility for HOV enforcement to the state patrol or state police. Some states may instead assign primary HOV enforcement responsibilities to local or regional agencies. Other agencies with the power to enforce HOV requirements may include transit authorities.

4) What enforcement issues need to be addressed in the planning stage of an HOV project?

Some of the most important enforcement-related issues that should be considered include:

- *Early Involvement of Enforcement Agencies.* State and local police involvement

during the planning process will ensure that the needs of enforcement personnel are being addressed and that the facility being planned will be enforceable. As the project evolves this becomes more critical.

- *Design Screening.* The degree to which an HOV facility can be effectively enforced is profoundly dependent on both the type of facility and the presence of adequate enforcement and refuge areas.
- *Funding and costs.* Depending on which agency assumes the primary responsibility for enforcement of the HOV facility, funding may have to compete with all types of enforcement as well as other, more critical responsibilities of the entire state.
- *Enforcement staffing and Scheduling.* The number of enforcement personnel assigned to cover an HOV facility can be highly variable between very similar projects. The level of effort assigned to each HOV project is dependent on many factors, with the most significant ones being facility length, facility operation, the degree to which a facility is conducive to enforcement activities, the types of enforcement strategies, and the availability of enforcement personnel. Enforcement agencies also need to consider institutional and human resource issues when assessing the manpower requirements for HOV enforcement.

5) What kind of violation rates are typically observed on HOV facilities?

Violation rates depend to some degree on the type of HOV facility. Contraflow and barrier-separated facilities usually have the lowest rates (typically 5 to 10 percent), and non-separated contraflow facilities have somewhat higher rates (10 to 20 percent). In the absence of effective enforcement, however, violation rates may exceed 60 percent during periods of peak congestion.

6) What kinds of HOV facilities are the easiest to enforce? The hardest?

Reversible barrier-separated facilities and contraflow facilities are generally the easiest type of facility to enforce, primarily due to the limited number of access points. Barrier-separated lanes also act as a deterrent to potential misuse, as violators are trapped in the lanes with few options to evade detection. Concurrent flow HOV lanes provide little or no physical separation from the adjacent freeway lanes. As a result, concurrent flow lanes are the most difficult type of HOV lane to enforce, as single-occupant vehicles may merge in and out at will. The perception of enforcement, as much as an actual enforcement presence, is an important attribute to managing lane violations on these facilities, and the more effective the design is at meeting this objective, the better enforcement needs are addressed.

7) What design features are considered critical for effective enforcement of Concurrent-flow HOV lanes?

Adequate space for median shoulders on concurrent flow facilities is tremendously important. The absence of a center median shoulder has an adverse impact on the safety of enforcement activities, as police are forced to apprehend violators by taking them across potentially congested general-purpose lanes to the right shoulder of the freeway. Where full 4.3 m (14 ft) median shoulders are not available, mainline enforcement areas should be considered at regular intervals, with typical spacing of 3.2 to 4.8 km (2 to 3 miles). A sufficient length should be provided to pull over a violator and, once cited, allow the violator to safely reenter the traffic stream. The minimum length required for this operation is approximately 400 m (1,300 ft), excluding tapers.

On buffer-separated facilities, painted buffers between 1.2 m and 3.6 m wide should be avoided, as some drivers may perceive and use the space as a breakdown lane.

8) What kinds of penalties exist for HOV violations?

Most states consider HOV violations to be moving violations, and roughly half of these impose “points” or demerits on license records. Fines range from as low as \$50 to as much as \$351 for a first offense. In addition, some states impose escalating fines for “repeat” offenders. In Northern Virginia, a fourth offense within 5 years costs \$1039 plus 3 points. California fines rise as high as \$876 for a third offense within a 12-month period.

9) What are the principle difficulties encountered when trying to count passengers, and can these be reduced?

Unless a good vantage point is used for observing vehicles, enforcement personnel have a hard time discerning the number of vehicle occupants. Even with an optimal viewing location, passenger counts are made more difficult by factors such as

- Poor lighting conditions or bad weather
- Dark window tint
- Backseat passengers, especially small children
- High vehicle speeds

Some of these difficulties can be overcome by designing enforcement features into the HOV facility. Raised observation areas can provide better vantage points, and low-speed enforcement areas can allow enforcement personnel more time to discern vehicle occupants.

10) I appreciate HOV enforcement, but wish that it wasn't so disruptive at times. How can the situation be improved?

Although visible enforcement is desirable, heavy enforcement can be disruptive to traffic as it usually induces rubbernecking. Minimally-intrusive enforcement techniques can significantly reduce the potential for traffic disruption. Enforcement personnel trained in these techniques

- Reduce the use of emergency lighting during traffic stops,
- Avoid multiple patrol vehicles at one location,
- Have no more than one car waiting to be ticketed at any time,
- Refrain from standing outside the vehicle, and

- For concurrent flow lanes, release violators cited in the median back into the HOV lane

11) Why is enforcement more critical on HOT lanes?

The concept of HOT lanes - selling “unused” capacity in the HOV lanes - means that the potential negative impact of uncontrolled violators on HOT revenue, person-movement capacity, and public approval can be large. HOT lanes in particular depend on public acceptance of the tolling concept, and effective enforcement provides visible means of promoting the fairness and integrity of the facility. Enforcement programs play an expanded role in HOT operations, due to the increased complexity of the enforcement task, and the inherently greater importance of enforcement to the continuing success of a HOT facility. Here, each violation has a direct economic impact on the HOT facility in the form of lost revenue from toll evasion. Since all HOT facilities utilize toll revenue to some extent for funding enforcement activities, excessive violations can financially impair enforcement efforts when greater expenditures in this area are most needed.

12) What additional challenges do HOT lanes pose for enforcement?

Enforcement personnel must deal with two major types of violations on HOT facilities – those involving a violation of minimum occupancy requirements, and the related problem of toll evasion. The presence of mixed toll and carpool vehicle traffic on High Occupancy Toll (HOT) lanes adds an additional challenge to effective enforcement. Regular toll lanes are amenable to automated enforcement techniques, such as license plate recognition (LPR) in combination with automated vehicle identification (AVI). However, usage of toll transponders on HOT lanes is not required for HOVs, while additional verification of vehicle occupancy is needed. Enforcement personnel must not only identify low occupancy vehicles, but also verify proper toll payment by these vehicles.

13) How can HOT lanes be operated, and how does this affect enforcement?

HOT lanes depend heavily on electronic toll collection (ETC) technology, and can potentially exploit the latest advances in automated toll enforcement. The degree to which toll enforcement can be automated is critically limited by the type of operating concept used on the HOT facility:

- *HOV Ineligibles Tagged.* Vehicles not meeting the eligibility/occupancy requirements for the HOT facility (i.e., those paying to use the facility) are the only vehicles required to have a toll transponder. At a stationary enforcement zone or through roving patrols the vehicle occupancy is first checked, and for vehicles not meeting occupancy requirements the toll payment must also be verified. Automated violation enforcement systems (VES) have thus far not been implemented under this operating concept, since not all vehicles are required to have transponders.
- *Universal Tag.* Under this operating concept, all vehicles in the HOT lane are required to have a toll transponder, including HOVs, and violation enforcement systems (VES) using photographic methods are used to enforce toll payment. Users in vehicles that meet the eligibility/occupancy requirements for the HOT

facility are required to access a special lane to receive a reduced (or zero) toll for the trip. This concept scenario follows the model used on toll facilities with electronic toll collection (ETC).

14) What exactly is a HERO program?

HERO programs are a type of self-enforcement that began in Seattle, Washington. The term HERO is more of a name than an acronym; as used in Seattle, it stands for HOV Lanes Education and Support. Signs and other communication techniques provide HOV users and non-users with a telephone number they can call to report HOV lane violators. The individuals anonymously report the sighting of a violator and give the license number, time of day, location, and any other supporting information to the HERO telephone operator. This approach has subsequently been used in other areas, including Houston, Texas and the Northern Virginia/Washington, D.C. region.

15) I have a hybrid vehicle. Can I ride solo in the HOV lane?

Virginia and California are currently the only states that allow single-occupant hybrid vehicles to use the HOV lanes. New rules for federal-aid highways give states the option to permit hybrids on HOV lanes, but only if these vehicles meet EPA standards.

16) If solo hybrid vehicles aren't permitted on HOV lanes, is there another kind of low emission vehicle that is exempt from carpool requirements?

Seven states currently permit Inherently Low Emission Vehicles (ILEVs) to be driven by a single occupant on HOV lanes. ILEVs are alternative fuel (non-gasoline) vehicles satisfying EPA standards for low evaporative and tailpipe emissions.

17) What are the circumstances under which law enforcement and emergency vehicles can use the HOV lanes?

Vehicles operated by federal, state, or local law enforcement personnel may be permitted to use HOV lanes as long as they are clearly marked law enforcement vehicles equipped with rooftop emergency lights and a siren. Officially marked emergency services vehicles, such as ambulances, fire and tow trucks, and emergency medical services vehicles are also allowed to use HOV lanes. This exemption from minimum HOV lane occupancy requirements only applies to on-duty personnel, and does not apply to personnel commuting to and from work.

18) Can automated methods be used to count the number of passengers? If not, why?

While attempts have been made in the past to use automated methods for HOV enforcement, these have all ultimately failed. Photo enforcement has been successfully defeated in courts on the grounds that it is not sufficiently accurate to constitute prima facie evidence of a violation. Photo enforcement also raises significant privacy concerns. A new generation of infrared cameras and more powerful image processing shows mild promise, but fully automated vehicle occupancy detection remains years away from being viable. Significant technical challenges remain, including accurate and reliable "face" counting, and the ability to detect small rear seat passengers.

19) How do enforcement personnel know if a HOT vehicle has paid the toll?

Technological countermeasures exist for all of the above forms of toll evasion on HOT facilities. As may be expected, the most comprehensive measures have the greatest capability for detection, but even relatively simple systems can effectively combat some forms of toll evasion.

- *Indicator Beacon.* One approach to transponder verification uses an AVI-activated overhead beacon mounted on the toll reader gantry to indicate when a toll transponder passes under the reader. Under this approach, enforcement personnel must be within the line of sight of the tolling zone in order to see both the overhead beacon and the triggering vehicle. Also, many ETC systems do not process billing transactions in real time, so this approach cannot determine if a transponder is linked to a valid toll account; it merely indicates that a readable transponder is present in the vehicle.
- *Handheld and In-vehicle Systems.* Compact and portable transponder verification systems are available in hand-held configurations, which are suitable in situations where a suspected violator has been pulled over by an enforcement officer. In-vehicle transponder verification systems enable enforcement officers to remotely verify transponders while driving alongside or behind vehicles in the HOT lanes.

20) Where can I find more information about HOV and HOT enforcement?

The *HOV-Lane Enforcement Handbook* is available at the FHWA Pooled Fund Study Website: <http://hovpfs.ops.fhwa.dot.gov/index.cfm>