

Issues in Enforcement of Busway and Bus and Car-Pool Lane Restrictions

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A preliminary effort to identify emerging problems associated with the legal, regulatory, judicial, and enforcement environments related to contemporary developments in preferential treatment for high-occupancy vehicles is presented. Specific problems and issues are illuminated, and solutions or processes that should generate remedies are recommended. Directions for further research into some of the unresolved issues associated with adequately enforcing the provisions of priority treatment strategies for multipassenger vehicles are suggested.

Enforcement of restrictions for busway and bus and car-pool lanes, for the most part, has not been an issue posing serious concern to transportation officials although there are exceptions to this. The early projects were usually designed as physically separated from the general traffic lanes through the use of barrier walls, traffic cones, and other implements. The entry and exit points to such projects have been singular or few in number. This physical separation has allowed busway and bus and car-pool lane projects to be implemented without enforcement of the lanes being a major consideration.

At present, the development of preferential treatment projects for high-occupancy vehicles is proliferating. This trend is a result of the proven success of the early priority projects, an increasing awareness of the people-moving capabilities of transportation systems, and the evolving emphasis on energy conservation. Urban areas are increasingly looking toward travel corridors involving freeways, arterial highways, and even local streets where such projects can be implemented. As the diversification in design of preferential treatment projects continues, the issue of enforcement of restrictions for busways and bus and car-pool lanes takes on greater importance.

Lack of realization of the importance of the enforcement issue has resulted in a number of projects that have realized a less-than-desired level of enforcement for the particular busway or bus and car-pool operation. Moreover, the enforcement issue can have a considerable im-

pact on the operational and safety aspects of these projects, especially those in which significant modifications of existing traffic patterns occur. The enforcement issue is thus a key factor in the development of a viable, safe, and successful preferential treatment project. Unfortunately, there are no guidelines available to assist local communities to develop successful enforcement programs for potential preferential treatment projects. A survey of the recent literature on the subject yields very little assessment of the implications of the busway or bus and car-pool lane enforcement issue. In order to begin to evaluate the issues of enforcement agency cooperation and planning, legal and judicial compatibility, and development of enforcement techniques and strategies, a questionnaire was sent through the auspices of APTA to a number of public transit agencies involved in busway and bus and car-pool lane systems. In many cases, the replies received (summarized in Tables 1 through 4) were not complete, nor was the sample of respondents fully inclusive of the entire spectrum of preferential treatment systems currently in operation. However, the information obtained as a result of this questionnaire is worth analysis as a basis for some preliminary conclusions that could be expanded and refined after additional research.

ENFORCEMENT AGENCY COOPERATION AND PLANNING

In many cases, a successfully implemented preferential treatment program is the result of the involvement of a broad mix of professionals—planners, traffic engineers, highway engineers, transit operators, and safety engineers—in the planning process. The involvement of the agencies they represent gives each a feeling of importance and proprietorship in the project and provides all of them with an impetus for the development of a successful project. A number of the affected enforcement agencies should also be included. As a member of the initial planning team, the enforcement agency can provide valuable assistance in (a) offering professional enforcement advice, (b) achieving the necessary commitments from the enforcement agency, and (c) developing specialized enforcement strategies and techniques. An appropriate scheme for integrating the enforcement program into the

planning process is shown in Figure 1.

In the development of busway and bus and car-pool lane projects, such questions as, Is the project enforceable? or How can the project be enforced? need to be asked early in the planning process. Among those attempting to answer these questions should be the enforcement agency since it has the knowledge to determine whether a preferential treatment project is self-enforceable, requires specialized enforcement in some manner, or is unenforceable. Project planners should avoid taking a planned project, no matter how self-enforceable it may be, to the enforcement agency and saying, Here, enforce it! or, How are you going to enforce it? The enforcement agency is infinitely more likely to cooperate with the ultimate enforcement program developed if it is a part of the planning process that developed the program, especially if enforcement will be difficult.

Moreover, the enforcement agency can also provide valuable input into the traffic operations design phase in the early stages of the planning process. The signing and striping schemes, as well as other motorist-information systems, for a preferential treatment project should be reviewed by the enforcement agency to ensure that there is no opportunity for the violator to claim that because of inadequate signing or information systems he was not cognizant of the restrictions. The enforcement agency, involved as it is directly with the judicial system, also has knowledge of possible judicial tendencies regarding various traffic operation schemes.

Understandably, the enforcement agency prefers that all busway and bus and car-pool lane projects be designed to be self-enforceable or at the very most require only a limited amount of enforcement supervision. However, in the trend toward more preferential treatment projects, especially the variety involving signalized arterials and streets, enforcement of busway and bus and car-pool lane projects cannot always be handled in a routine manner. Certain projects, in order to provide the optimum operational system, may require a dramatic increase in

the level and type of enforcement on a particular facility. In planning such a project, some proper and correct decisions regarding its operational strategy may require adverse effects on its enforcement policy. If the enforcement agency has been involved in the planning, it will understand such decisions, making them much more palatable. Involvement of the enforcement agency in the planning also guarantees that effects on enforcement were indeed considered.

When a specialized enforcement technique or additional enforcement personnel or both are shown in the planning process to be necessary, a commitment toward enforcement of the preferential treatment strategy by the affected enforcement agency should be sought at that time. This attempt to secure a commitment is essential in that (a) it will ensure an adequate level of enforcement, or (b) if a commitment fails to be obtained, the necessary corrective action can then be undertaken at an early stage in the planning process.

If the question of additional enforcement activity is to be resolved by supplying additional manpower and equipment, the issue of financing such an option becomes important. If the enforcement agency is contacted early enough, future agency budgets can be adjusted to include the resources required. A positive alliance between the project and the enforcement agency will be formed, since the project can serve as justification for the agency in its request for additional funding. Again, the enforcement agency is in the best position to provide insight into the problems associated with securing additional financing for enforcement activities and should be an essential party in the preliminary planning process.

LEGAL AND JUDICIAL COMPATIBILITY

An effective enforcement treatment of a preferential treatment project does not rest solely with those activities that occur at the site of a project. Keeping the preferential treatment strategy operating smoothly is only one aspect. The other is ensuring that the project oper-

Table 1. Enforcement questionnaire summary: description of projects.

Facility	Location	Operation		Busway Length (km)	Bus Volumes		Type of Buses Allowed	Car Pools Allowed
		Type	Time		Daily	Peak Hour		
I-5	Seattle	Express lane	24 h	1.6	360	223	Local public transit	No
Wash-520	Seattle	Shoulder bus lane	6 to 9 a.m.	2.1	46	46	Local public transit	No
Wash-522	Seattle	Shoulder bus lane	24 h	2.4			Local public transit	No
I-90	Seattle	Shoulder bus lane	24 h	0.3	115	63	Local public transit	No
US-101	Greenbrae, Calif.	Bus lane	6 to 9 a.m. 4 to 7 p.m.	6.4 14.4	285	101	All buses	Yes ^a
I-495	New Jersey	Contraflow bus lane	7 to 10 a.m.	4.0	1050	550	All buses	No
US-1	Miami	Contraflow bus lane and car-pool priority lane	7 to 9 a.m. 4 to 6 p.m.	8.8 9.8	61	20	Local public transit	No ^b
George Washington Bridge	New Jersey	Bus lane	7 to 9 a.m.	0.6	85		All buses	No
I-95	Miami	Exclusive bus and car-pool lane	6 to 10 a.m. 3 to 7 p.m.	12.0			All buses	Yes
N.W. 7th Avenue	Miami	Center-reversible exclusive bus lane	6 to 9:30 a.m. 3 to 6:30 p.m.	15.8	53	18	Local public transit	No
—	Washington, D.C.	Curb bus priority lane	7 to 9 a.m. 4 to 6 p.m.	35.2		60 to 150	All buses	No
I-93	Boston	Exclusive bus and car-pool lane	6:45 to 9:15 a.m.	0.8	42	42	All buses	Yes
—	San Juan, P.R.	Contraflow bus lane	24 h	12.8		256	Local public transit	No

Note: 1 km = 0.6 mile.

^aIf over 11 seats. ^bFor bus lane.

ates in a favorable legal and judicial climate. Failure to enact the latter can easily undermine the former.

A necessary prerequisite to the design of an effective preferential project is the study of applicable existing state and local laws pertaining to traffic enforcement. Specific questions that should be answered include:

1. Do the existing laws or ordinances provide adequate authority to local or state agencies to restrict the use of lanes to certain types of vehicles? What procedures must be followed to implement such restrictive measures?
2. Do the enforcement jurisdictions have the author-

ity to apprehend and cite violators of such lane restrictions? Does the apprehending officer have to be a witnessing officer in order to cite the violator?

3. Does the judicial system have sufficient authority to impose fines and penalties for violations of lane restrictions?

Since state and local laws vary considerably from jurisdiction to jurisdiction, each potential preferential treatment project must be investigated independently in order to determine if changes in existing legislation must be made. It is essential that a legal opinion be obtained to ascertain the sufficiency of existing laws and their enforceability.

Table 2. Enforcement questionnaire summary: types and effectiveness of prohibitions.

Facility	Other Vehicles Allowed	Prohibitions	Prohibitions Effective	Signing	Pavement Markings
I-5	Emergency	Buses only	Yes	Buses only	BUS ONLY and lane buttons
Wash-520	Emergency	Buses only	Yes	Buses only	BUS ONLY and lane buttons
Wash-522	Emergency	Buses only, allowed right turns	Yes	Buses only	BUS ONLY and lane buttons
I-90	Emergency	Buses only	Yes	Buses only	BUS ONLY and lane buttons
US-101	None	Buses only	Yes	Buses only	Safety posts
I-495	Marked police cars	Buses only	Yes	Buses only	Safety posts
US-1	Emergency	Contraflow lane: buses only Car-pool lane: 2 persons/vehicle min., no left turns	Yes	Overhead MTA BUS ONLY	Safety posts
George Washington Bridge	Emergency	Buses only	Yes	Restricting use to buses	Cones
I-95	Emergency	3 persons/vehicle min.		Overhead signs	Solid white line
N.W. 7th Avenue	Emergency	Buses only, no left turns except at designated locations	Yes for buses only; fair for no left turns	Overhead BUS ONLY	BUS ONLY
Washington, D.C.	Emergency, right-turning vehicle, bicycles, taxis	Buses, taxis, bicycles, and right-turning vehicles only	Generally	NO STANDING	BUS LANE and yellow lines
I-93	Emergency, government	3 persons/vehicle	Yes	Overhead	Asphalt dividers
San Juan	Motorcycle patrol	Buses only		Conventional	Yellow and white lines

Table 3. Enforcement questionnaire summary: legislative-judicial effects and results.

Facility	Legislative Changes Required	Fines Imposed	Prosecution Successful	Enforcement Plan ^a
I-5	No	Normal	Yes	Standard
Wash-520	No	Normal	Yes	Standard
Wash-522	No	Normal	Yes	Standard
I-90	No	Normal	Yes	Standard
US-101	No	\$15		Special automobile and motorcycle patrol
I-495	No	\$25	Yes	Special automobile, motorcycle, and foot patrol involving 5 officers and 4 vehicles
US-1	No	\$25	Fair ^b	Special automobile and motorcycle patrol involving 6 officers and 6 vehicles
George Washington Bridge	No	\$15 + \$5	Yes	Standard
I-95	No	\$25	Yes	Standard
N.W. 7th Avenue	No	\$25	Yes	Standard
Washington, D.C.	Yes ^c	\$10 to \$25	Unknown	Standard
I-93	No			Standard
San Juan		None		Special motorcycle and transit route inspection patrol

^aStandard enforcement is defined as normal police patrol using two way radio communications and only the witnessing officer being the apprehending officer. Exceptions to this standard enforcement plan are listed.

^bJudge accepted ignorance of law as excuse.

^cAmendments to the D.C. traffic regulations.

Once the enforcement agency has done its work by issuing a citation for violation of the lane restrictions associated with a preferential treatment project, the project enters the courtroom and is subject to judicial interpretation. In cases where it is not possible to obtain a commitment from the appropriate superior judge, the project can ensure that those judges involved are fully briefed on the project. The judges should know the objectives of the preferential treatment project and the various operational strategies incorporated in it. A successful briefing will show the judges that the project is of public value and properly designed.

Failure to properly brief the judges can mean adverse

(or less desirable) rulings that could then cause a loss of enthusiasm for the project by the enforcement agency. No enforcement agency desires to have its time and effort overruled—even if correctly—by the judicial arm of government. When such a possibility exists, the enforcement agency, rather than seek this embarrassment, tends to enforce the project with less vigor.

DEVELOPMENT OF ENFORCEMENT TECHNIQUES AND STRATEGIES

In developing specific techniques and strategies for enforcing the restrictions of a busway or bus and car-pool lane, it is first necessary to determine the goals and objectives that the enforcement program will strive to achieve. Once the goals and objectives are determined, the appropriate enforcement techniques and strategy can be developed. The overriding goal of any enforcement program is to provide an effective and safe operation. If this basic goal cannot be achieved, then the project will fail. It should be noted that this goal of providing effective and safe operations is not the sole responsibility of the enforcement agency but to a very great extent rests in the design of the preferential treatment strategy.

The matter of the violation rate of a preferential treatment strategy must also be examined. Should the enforcement objective be to maintain the violation rate at a specific predetermined level or to permit fluctuations so long as they do not impair the operations of the preferential treatment strategy? If the latter is chosen, it may result in an operationally efficient busway or bus and car-pool lane project in which the violating vehicles exceed the qualifying vehicles. This high violation rate could taint the project in the public's eye.

The standard enforcement strategy is usually to maximize the enforcement effort at the outset of a project (after a reasonable familiarization period) in order to maximize user perception of the probability of apprehension. Once the user has been conditioned to this, a lesser level of enforcement may be used with varying levels of enforcement applied strategically or randomly

Table 4. Enforcement questionnaire summary: enforcement performance satisfaction.

Facility	Enforcement Agency	Enforcement Agency Cooperation	Enforcement Performance Satisfactory
I-5	State and city police	Complete	Yes
Wash-520	State and city police	Complete	Yes
Wash-522	State and city police	Complete	Yes
I-90	State and city police	Complete	Yes
US-101	State police	Complete	Yes
I-495	State and port authority police	Complete	Yes
US-1	County and city police	Average to good	Yes
George Washington Bridge	Port authority police		
I-95	State police	Poor	No ^a
N.W. 7th Avenue	County and city police	Average	No ^a
Washington, D.C.	City police	Fair to poor	No ^b
I-93	State police	Complete	Yes
San Juan	State police	Average to good	No ^c

^aSpecial enforcement and sense of participation are necessary.
^bPolitical emphasis is necessary.
^cRegulations by law, including penalties, are necessary.

Figure 1. Suggested flow for integrating enforcement planning into preferential treatment project planning.

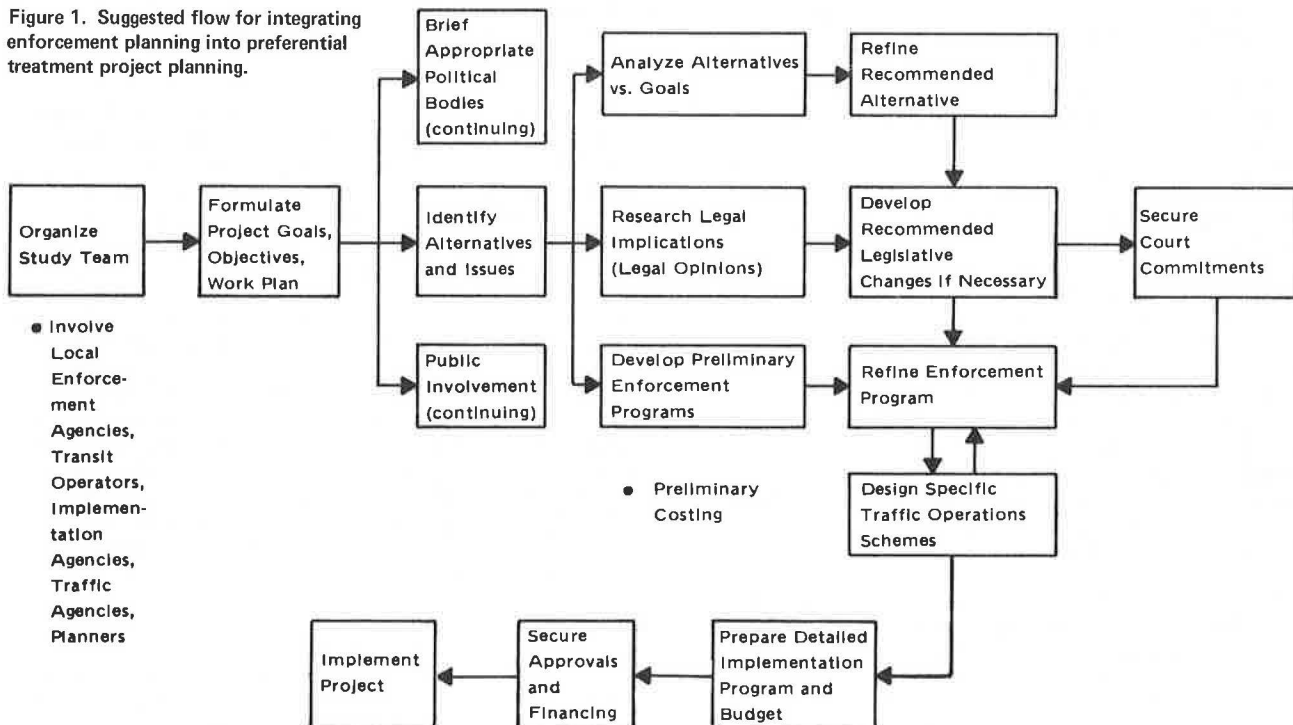


Table 5. Principal findings.

Type of Operation and Restriction	Relative Degree of Enforcement Problem	Predominant Type of Enforcement Problem
Physically separated busway, bus lane, or bus and car-pool lane	Low to none	NA
Nonphysically separated bus lane or bus (car-pool) lane on freeway	Medium to high	Illegal through trip users
Nonphysically separated bus lanes on arterial street with turning restrictions (including reversible center lanes and contraflow lanes with separation)	Medium to high	Turning vehicles violating turning restrictions
Nonphysically separated car-pool lane on at-grade, arterial streets with turning restrictions	Medium to high	Illegal through trip users and turning vehicles violating turning restrictions

throughout the operating period. One possibility is to monitor the violation rate, and if it increases past the desired level, increase the enforcement level.

Because enforcement has not been an important issue in the past, there is very little information on the effects of differing levels of enforcement manpower and strategies on the violation rate. To further cloud this issue, little is known as to how users of a particular facility—freeway, arterial, or local street—react to a particular preferential treatment strategy. This lack of information is the primary reason for the use of the time-tested strategy of heavy enforcement at the outset of a project with diminishing enforcement as the violation rate diminishes and user awareness increases.

As the enforcement issue increases in importance, much more information on motorists' reactions to different priority treatments and to the impact of different enforcement levels and strategies will be necessary to design the enforcement activity. What is the relative impact of two, four, or six troopers concentrating on a busway or on bus and car-pool lanes? What are the relative effects of patrolmen issuing citations or warnings or of simply being visible? Proper answers to these questions will allow the design of an enforcement technique and strategy that optimize the program's objectives.

Specific enforcement measures used by the majority of agencies currently enforcing preferential treatment programs usually involve the use of conventional techniques (i.e., normal patrol operations). Very little experimentation or research is being conducted into the possible use of capital-intensive as opposed to labor-intensive techniques. The use of electronic surveillance systems and the like, in conjunction with remote apprehension operations, has not been applied to preferential systems enforcement. This may be accounted for by a combination of factors including (a) the lack of necessity for resorting to such systems in order to achieve a reasonable level of enforcement, (b) the cost associated with procuring and installing such systems, and (c) legal restrictions on the use of such systems (many states require that only a witnessing officer can cite a violator).

The relation between the particular design of a preferential treatment strategy and the enforcement strategy further complicates the development of enforcement techniques and strategies. Specific design variables affecting enforcement include the number, type, and location of regulatory restrictions, the physical roadway

operation scheme, and the availability of storage facilities (areas that allow for violators to be removed from the traffic stream and cited without disrupting traffic flow). Certainly, a traffic regulation such as no left turn that is in force throughout the length of a project is more difficult to enforce than one that is in force at only limited locations. Similarly, enforcement is more difficult for unlimited entry and exit to a busway and car-pool lane than for limited entry and exit.

The designation of a priority treatment for buses only or buses and car pools tends to affect the violation rate. Motorists are more likely to violate the priority facility if car pools are permitted to use it since the violator's visibility is less noticeable. The designation of a car pool has a minor impact on the enforcement efforts, for it is easier to separate vehicles by classifying them as single or multiperson occupancy. Thus, the single-passenger violator of a two-person-minimum car pool is easier to identify than the multipassenger violator of a three or four-person minimum car pool.

Once the enforcement team witnesses a violator of the system, it is best that he be apprehended immediately. To accomplish this, it is necessary to have accessible storage areas to which the violator can be removed so that the traffic flow is not impaired. If accessible storage areas are not provided, additional effort by the enforcement teams is required.

It may not always be possible to design a busway or bus and car-pool lane project so as to benefit enforcement efforts. Since the major goal is to increase the people-moving capability of the roadway, decisions adversely affecting enforcement may be necessary. For example, a bus-only designation is more easily enforced than a bus and car-pool designation but may not maximize passenger throughput or minimize total passenger travel time. Lack of available right-of-way may likewise eliminate storage facilities for apprehended vehicles, thereby compromising a desirable enforcement scheme. These problems must be addressed by the planning team in conjunction with the enforcement team.

PRINCIPAL FINDINGS

A number of preliminary observations (summarized in Table 5) can be made from the information returned via the questionnaires.

1. Exclusive busways and physically separated bus and car-pool lanes are successful without expending special efforts on enforcement. In this context, physically separated includes low-cost techniques such as safety posts and cones, as well as more expensive techniques such as barrier walls and the like.

2. Conversely, exclusive bus and bus and car-pool lanes that do not have the advantage of some form of physical separation have had significantly more enforcement problems. Specific examples include Northwest Seventh Avenue, US-1 and I-95 bus and car-pool lanes in Miami, and curb bus lanes in Washington, D.C.

3. Preferential treatment projects requiring turning restrictions on at-grade arterial streets are difficult to enforce. Violators of these restrictions expose the project to the possibility of increased accident rates.

4. To date, only conventional normal-patrol enforcement techniques have been applied to enforcement programs for preferential treatment projects.

RECOMMENDATIONS

At present, bus and bus and car-pool lane restrictions are enforceable, provided sufficient thought and effort are devoted to some of the issues discussed in this paper.

However, as diversification in the design of preferential treatment programs continues, the need for emphasis on issues associated with enforcement will increase. A number of busway and bus and car-pool lane projects presently established have not achieved a satisfactory level of enforcement; this fact tends to support the conclusion that enforcement is an important aspect of the planning process of the preferential treatment project. Unfortunately, there are no guidelines to assist the development of successful enforcement programs for projects of this nature, and additional research is needed. In planning a viable enforcement program, several policies emerge as particularly important to this process.

1. Special attention and effort should be devoted to enforcement problems when a preferential treatment program is planned that involves nonphysically separated priority lanes.

2. The enforcement program should be an integral part of the planning and design process. An effective enforcement program and strategy should be developed in specific terms in conjunction with the local enforcement agency. Key issues in the enforcement planning process will be (a) the identification of specific objectives in terms of acceptable and achievable violation rates to be maintained, and (b) identification of an appropriate level of enforcement and specific techniques for achieving this goal. A commitment should be obtained (in writing, preferably) from the enforcement agency indicating that it will enforce the restrictions of the project.

3. The legal and judicial climate will also play a role in the success or failure of a proposed enforcement plan. Legal research should be done and a legal opinion obtained regarding the existing laws and ordinances governing traffic regulations in the area in question. A commitment should be obtained from the local judicial system indicating its intent to uphold citations issued for violations of restrictions associated with a preferential treatment project.

4. There is a distinct relation between the operational plan for a preferential treatment project and the enforcement plan necessary to ensure its effectiveness. Special attention should be devoted to the design configurations, particularly signing, turning restrictions, detention areas, and such. Safety considerations should also be given special attention to minimize the probability of increases in accidents. Driver education plays a key role in this area.

5. The use of innovative enforcement techniques should be explored.

6. Local relevant political entities should be briefed periodically throughout the course of the planning and design process.

7. The preferential treatment program should include an element of before-and-after evaluation to determine the effectiveness of the project and its ability to achieve its objectives.

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