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Role of Law Enforcement in Transportation Planning

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The operational expertise that law enforcement has gained in carrying out its traffic safety mandate is seldom voiced, considered, or even sought as a part of the transportation planning process. This is partly a result of a lack of understanding of the complexities of transportation planning among the law enforcement community and others who share responsibility for the implementation of public policy. It also stems from the fact that the traditional law enforcement focus has been on problems of expediency, and law enforcement agencies are reluctant to become involved in planning. The obvious result of this situation can be (and often is) that society receives a suboptimal return for the capital improvements made to the transportation system in both operational efficiency and the prevention of economic loss from accidents. In the era of plentiful funding, the effects of incomplete or misdirected planning could be overcome through trial and error. Today, however, such luxury can no longer be afforded. A framework is needed so that all parties who have an interest or expertise in transportation can contribute toward a determination of the most desirable alternatives to meet transportation needs. Within such a framework, the operational expertise of law enforcement can provide vital assistance to transportation planners in the attainment of a broad range of transportation goals.

As this nation's highway system developed, certain tasks associated with highway operations were inevitably assigned to or assumed by law enforcement agencies. Typical of those tasks are traffic law enforcement, congestion relief, parking control, and accident investigation. This operational orientation has continued to the present. Consistent with this traditionally operational role, enforcement agencies have seldom contributed their expertise to the development of local, regional, or statewide transportation plans. The philosophy has been that enforcement agencies need not be involved with transportation projects until after facilities have been constructed. And then, their involvement is generally limited to expressing safety and operational concerns in an effort to bring about engineering corrections or to acquire additional resources to handle problems not anticipated during plan development.

This relationship between transportation planners and law enforcement has not been altogether unsuccessful. Despite the absence of police participation during the planning process, safety and other law enforcement concerns have not been totally ignored. Modern highways reflect lessons learned in the past, and the existence of state highway patrols and traffic divisions within local police departments is an indication of an awareness of transportation-related enforcement needs.

Unfortunately, for enforcement agencies to maintain their traditional reactive stance with respect to transportation planning is no longer feasible or responsible. One reason for this is the expansion of transportation purposes, or goals, and the

strategies that have been adopted to achieve those purposes. Where transportation was once viewed simply as a means of mobility, it is increasingly being accepted as a means to achieve other social, economic, and environmental objectives. These objectives would include, for example, rational growth, enhancement of existing urban areas, conservation of fiscal and natural resources, minimization of environmental degradation, and achievement of social equity.

CASE FOR PLANNING IN TRANSPORTATION SYSTEM MANAGEMENT PROJECTS

With respect to this new direction of transportation, and of particular interest to law enforcement, is the emphasis being placed on the application of transportation system management (TSM) strategies. Many TSM strategies are dependent on enforcement for their success. High-occupancy-vehicle (HOV) lanes on freeways and metered-ramp bypass lanes are examples of this dependence. An HOV facility that is overcrowded with vehicles that carry fewer than the required number of passengers provides little or no time-saving advantage or incentive for carpools and vanpools. Appropriate enforcement of TSM-related traffic regulations can help to maintain the incentive needed to ensure that the purposes of such facilities (e.g., decreased congestion and fuel conservation) are achieved.

Conversely, the lack of law enforcement involvement during planning for TSM facilities can result in situations where enforcement agencies are unable to provide an adequate level of service. Recent experience with TSM projects provides several pertinent examples. In Miami, during the three-person carpool phase on the Interstate 95 preferential lane, minimal enforcement resulted in a violation rate of 75 percent. Likewise, in Boston, a self-enforcing voluntary diamond lane experienced a violation rate of greater than 80 percent. Both of these projects had a specific characteristic that precluded the application of traditional traffic law enforcement tactics: Neither project had a median shoulder to permit the immediate stopping of a violator. Consequently, if any enforcement action was to be taken, the officer would have to follow the violator to the terminus of the project. A slightly different situation occurred in California. Enforcement of the Santa Monica diamond lane regulations kept the violation rate between 10 and 20 percent; however, absence of any physical separation between the diamond lane and the general traffic lanes, coupled with the speed differential

between the two types of lanes, created a situation in which accident rates increased by as much as 150 percent.

Another situation that illustrates dramatically the need for law enforcement involvement in the initial planning of a high-cost project is the proposed I-105, Century Freeway, in Los Angeles. This 17-mile freeway project will incorporate several TSM strategies and cost approximately \$1.7 billion. The freeway is being designed to accommodate mass transit facilities within a 64-ft-wide median. The long-range plan calls for a light rail system; however, the freeway will be served initially by buses that use the rail bed. In addition, HOV lanes, transfer facilities, and park-and-ride lots will be strategically situated along the project corridor.

This enormous investment of public funds for the I-105 project dictates that consideration for the ultimate success of the project not be limited to the aesthetic, environmental, and basic transportation issues. It is imperative that the entire facility fulfill the purposes for which it is being built. Therefore, project planning must include comprehensive consideration of enforcement needs, not only in terms of personnel but also with respect to facility design. First, without engineering for enforcement and provision for a level of service sufficient to ensure a minimum violation rate, the HOV lanes can be expected to be less than effective. Consequently, the incentive for motorists to carpool or use mass transit would be lost and the entire corridor would suffer from the increased congestion and air pollution that result from the breakdown of the system.

Another concern that law enforcement input should be used to address is that of crimes against persons and property that occur in or about the transfer stations and park-and-ride facilities. These locations, by virtue of the large number of people and vehicles and predictable traffic patterns, are an attractive setting for the criminal element. Activities such as vandalism, pickpocketing, automobile theft, and assault must be discouraged if the motoring public is to consider mass transit an attractive transportation alternative. Law enforcement expertise during the planning for transit-related facilities will help to ensure that safety and security needs are adequately addressed, and thereby contribute to the ultimate attainment of transportation goals.

LAW ENFORCEMENT PARTICIPATION

To provide adequate enforcement under circumstances such as those described in the preceding examples requires a substantial redeployment of available resources. The alternatives are to either abandon the projects or attempt to alter design configurations. This suggests a second reason for law enforcement participation in the transportation planning process--cost. Project abandonment, redesign, and redeployment all involve costs that are reflected in either additional resource requirements or a decreased overall level of service. In many cases, law enforcement involvement in the transportation planning process could help to avoid or minimize those costs since operational problems are less expensive to solve prior to the pouring of concrete. Finally, from an enforcement resource point of view, it will usually cost less to maintain acceptable violation rates if enforcement needs are recognized during the planning stages and personnel and procedures are made available on implementation rather than allowing high violation rates to become an established practice. In a similar sense, competition for public funds is increasing and it is no

longer realistic to expect law enforcement agencies to justify budget increases for transportation projects that have already been built.

These observations are indicative of only a few of the problems and opportunities that surround law enforcement involvement in the transportation planning process. Clearly, effective operations, cost-efficient use of resources, and both economic and social concerns for traffic safety are within the purview of law enforcement responsibility. The conclusion that there is a need for greater law enforcement involvement in transportation planning is no guarantee, however, that such involvement will occur. Resistance both within and without the law enforcement and transportation planning communities is inevitable. Even when there is general support, there will be obstacles to overcome. A significant problem is that few transportation planners have any substantive ideas about how to best use the expertise of law enforcement during the planning process. Therefore, the responsibility for initiating participation will largely be borne by enforcement agencies. This may also be of concern to law enforcement because many agencies do not have personnel who are sufficiently familiar with the transportation planning process to design and implement an effective program for involvement.

FRAMEWORK FOR INVOLVEMENT

The California Highway Patrol has developed a program or framework for involvement in the transportation planning process. This program is called Transportation Planning for Operations, Resources, and Traffic Safety (TRANSPORTS). Applications outside California would naturally require modification to fit the particular transportation planning environment in question.

Concerning the transportation planning environment, transportation planning in California is governed by statute and is designed to facilitate planning on a regional basis. Every other year the regional transportation planning agencies (there are 43 regional agencies) prepare individual regional transportation plans (RTPs). The California Department of Transportation (Caltrans) uses these RTPs as input in preparing its annual proposed State Transportation Improvement Program (STIP). The proposed STIP is transmitted to the regional planning agencies, and those agencies that represent urban areas that have populations of 50 000 or more prepare and adopt a Regional Transportation Improvement Plan, (RTIP), which can differ from the proposed STIP. Regional planning agencies that do not represent urban areas of 50 000 or more review the portion of the proposed STIP that concerns their respective region and develop comments. Disagreements raised by comments on the proposed STIP or RTIP differences are resolved by the California Transportation Commission, which has ultimate responsibility for developing and adopting the STIP.

The California Highway Patrol is responsible for providing enforcement services on all highways within unincorporated areas of the state and all freeways, wherever they are located. The patrol's headquarters is in Sacramento and eight field divisions are located throughout the state. Divisions are divided into area commands, and there are 96 such areas.

It is within these transportation planning and operational environments that the California Highway Patrol is attempting to establish its TRANSPORTS program.

TRANSPORTS

The main thrust of TRANSPORTS is departmentally

oriented; however, the program is intended to contribute to improved transportation system effectiveness and the ability to deal with change, externally as well as internally. The overall objectives of the TRANSPORTS program are as follows:

1. To promote traffic safety and departmental objectives in the transportation planning process and
2. To facilitate the coordination of departmental planning (strategic, resource, and operational) and the transportation planning process at all government levels (local, state, and federal).

The basic approach to achieving these objectives will be to develop and implement a departmentwide program of internal education, research, planning, and representation. These functions are the four elements of the TRANSPORTS program.

Program Concept and Framework

Figure 1 is a general model of the major elements of the TRANSPORTS program and their interactions. As can be seen, all program elements are interrelated and contribute not only to the TRANSPORTS purposes and objectives but also to the support and operation of each individual element.

Inasmuch as Figure 1 describes graphically the element relationships, the model is mainly a broad, functional description of the TRANSPORTS program. In order for the model to have working value, direction must be provided to coordinate and balance each element with respect to three program dimensions: level of participation, subjects of emphasis, and areas of involvement.

Program Dimensions

The level of participation is, in essence, a recognition that participation in transportation systems planning may be accomplished in several interactive ways with varying intensities. Ideally, interaction among agencies, public officials, and

private groups should take place throughout the entire system planning process. The desirable characteristics of such interaction are that all participants should feel that their interests are adequately represented. Informal as well as formal ties should be developed, and each participant should make the choice as to how deeply involved in the process he or she could and should be. Levels of participation are applicable to the other two program dimensions in terms of actions taken or degree of activity. Interaction at any participation level cannot be self-serving but must contribute to improving the decision-making process if the program is to be successful.

The subjects of emphasis are defined as enforcement operations, resources, and traffic safety. These areas reflect, in general, the purposes of law enforcement's involvement in the transportation systems planning process.

Areas of involvement, the last dimension of the program, provide the direction for participation in the transportation systems planning process. Three areas of involvement have been established:

1. Systems policy includes those decision-making activities associated with broad economic, social, and environmental factors; typical policy areas would include level of service, funding, mode selection, and needs assessment;

2. System facility design includes those decision-making activities that address facility configurations, locations, operations, and implementation of transportation facility projects;

3. Systems engineering includes those decision-making activities that relate predominately to traffic safety.

Taken together, these three dimensions provide the framework for law enforcement's participation in the transportation systems planning process. As shown in Figure 2, the levels of participation provide the how of involvement, the subjects of emphasis provide the why, and the areas of involvement describe what to be involved in. Within this framework, for a given area of involvement and subject of emphasis, levels of participation may vary, depending on location or other circumstances. Thus, a basic principle of this program is the recognition of diversity in transportation planning. Law enforcement involvement in the process should be commensurate with the scope and implications of the planning being performed.

The conceptual framework and the principles of commensurable involvement are not only significant to the development of the program elements that fol-

Figure 1. TRANSPORTS model.

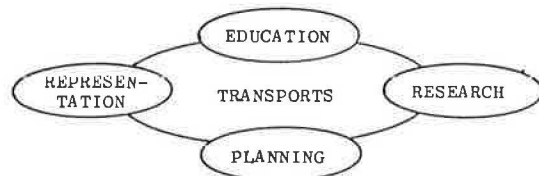
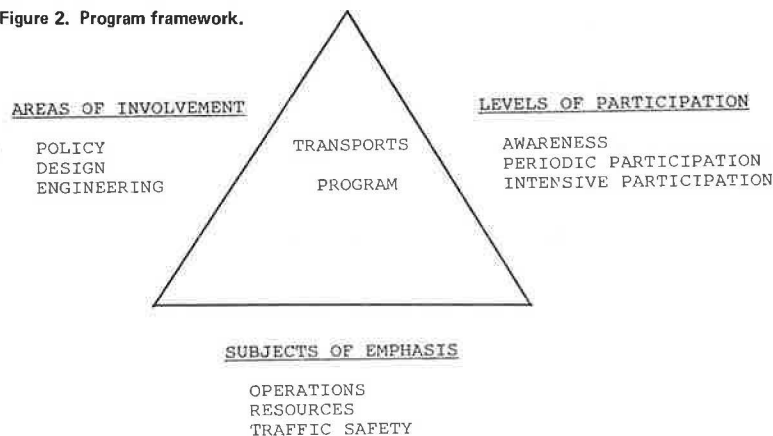


Figure 2. Program framework.



low but also to the implementation of the program. This is perhaps best illustrated through the education element where, for example, a system of courses in transportation planning may be developed that range from basic awareness to intensive coverage. The basic awareness course would then be conducted for all management personnel, but only those management personnel (or their staff) that have the need (e.g., managers of commands located in major regional planning areas) would be given the advanced course. Other parallel examples could be given for the other program elements; however, the basic principle is the same--involvement in the process should be commensurate with need.

Program Elements

The TRANSPORTS program consists of four elements: education, research, planning, and representation.

Education

The purpose of education is to increase awareness and interest in the transportation systems planning process as it impacts or affects the law enforcement agency's missions, goals, and objectives. In addition, it is intended that, through this element, individual skills necessary to work with transportation planning will be developed in varying degrees, based on need.

Research

The purpose of research is to (a) develop concepts, methods, and information concerning transportation and transportation systems that will be useful to the management and operation of the law enforcement agency; (b) contribute to the other TRANSPORTS program elements; and (c) expand the knowledge of the law enforcement-transportation planning communities. The scope of this element is constrained by the enforcement agency's goals and objectives, the subjects of emphasis, and the areas of involvement presented in the program framework.

Planning

The purpose of planning is to transfer the information gained through the program elements research and representation to the agency's routine planning processes. Through this activity it is intended that proactive agency plans will be developed to provide the overall direction needed

1. To assist the organization to more effectively fulfill its public responsibilities and
2. To identify opportunities for the organization to make even greater contributions to the goals of effective transportation systems.

Representation

Representation is externally oriented and is vital to the success of the program. The purpose of this element is directly related to the overall program objective of promoting traffic safety and the objectives of the law enforcement agency in the transportation planning process. Representation will help the law enforcement agency to identify and deal with problems directly related to the responsibilities of other entities. Likewise, the agency will become a resource for the planning community by being able to contribute another dimension in the analysis of problems and the development of alternative solutions.

Many representation strategies could be devised

to achieve the TRANSPORTS objectives. A sampling of these potential strategies would include the following:

1. Initiation and maintenance of staff contacts with other appropriate and involved governmental agencies,
2. Development of existing and new contacts with nongovernmental agencies involved in the planning process (e.g., automobile club, highway users federation, environmental organizations, and citizens' groups),
3. Development of federal transportation agency contacts,
4. Development of local and regional planning contacts, and
5. Enhancement of liaison activities with the state department of transportation.

Anticipated Benefits

The ultimate benefits of law enforcement participation in transportation planning include a reduction in the number and severity of traffic accidents, alleviation of traffic congestion, and improved enforcement operations. These benefits will not, however, be achieved as a direct result of establishing a TRANSPORTS program. The primary role of such a program will be one of ensuring that enforcement concerns are considered in the transportation systems planning process and that enforcement personnel are properly equipped to contribute to the process. The decisions that result from law enforcement involvement in the transportation planning process will lead to achievement of the higher-order benefits.

From a practical or operational point of view, implementation of a law enforcement transportation planning program can be expected to provide many additional tangible and intangible benefits. Examples of these anticipated benefits include the following:

1. Improved resource utilization and needs assessment. This occurs through participation in project development where operating strategies can be developed and resource requirements determined. Research activities also contribute in this area.
2. Increased awareness of the role transportation plays in the socioeconomic environment and the contribution enforcement efforts make to this setting. This occurs primarily as an educational-training activity both internal and external to the enforcement agency. Externally, the role of law enforcement is enhanced. Internally, the insight gained contributes to opportunity identification and expansion of the agency's overall value.
3. Improved service to the public. This benefit affects not only safety, security, and other emergency services but also extends to fiscal responsibility and information delivery concerning the highway system.
4. Increased contribution to the field of transportation, traffic safety, and traffic law enforcement. This occurs primarily through research but also through representation in the transportation systems planning process.

SUMMARY

The TRANSPORTS program, or any similar program, should not put law enforcement agencies in the business of transportation planning. The primary concerns of law enforcement with respect to the transportation system must continue to be safety, security, and enforcement operations. The law

enforcement perspective, however, is a resource that is available to the transportation planning community, not only for its safety expertise, but for improving the effectiveness and efficiency of the transportation system and ensuring that the goals and objectives for individual projects are met. Awareness of that perspective and using it for the

public good are the sole purpose and intent of TRANSPORTS. The transportation planning and law enforcement communities must share the responsibility for bringing that perspective into focus.

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Enforcement of TSM Projects

JOHN W. BILLHEIMER

Transportation system management (TSM) strategies introduced on California freeways in recent years have included ramp metering, preferential lanes for high-occupancy vehicles, and bypass lanes for buses and carpools at metered ramps. Several factors have frustrated efforts to enforce the traffic laws that accompany these strategies; these include personnel limitations, enforcement priorities, public hostility, confusion, and physical constraints imposed by the geometry and design of specific projects. As a consequence, violations have increased on several projects. This paper covers the first six months of an ongoing two-year study designed to measure and evaluate the effect of different enforcement options, engineering features, and educational programs on violation rates for various TSM freeway strategies and to trace the resulting impact of these violation rates on safety, freeway performance, and public attitudes. During this six-month period, statistics were assembled to describe violation rates, enforcement levels, and operating performance on current and past California projects; drivers were surveyed; and different levels and combinations of routine and special enforcement activities were tested on a variety of TSM projects. Violation rates were measured before, during, and after the assignment of highway patrol officers to enforce specific projects. This paper documents current violation rates, sketches profiles of violator behavior prior to special enforcement activities, outlines the preliminary results of the first wave of special enforcement, and documents the results of surveys designed to test the attitudes of drivers toward violators, enforcement, and the TSM projects themselves.

Adequate control of violation rates on preferential lanes for high-occupancy vehicles (HOVs) and other transportation system management (TSM) projects requires an effective mixture of enforcement, engineering design changes, and public education. Although past experience with similar projects has given the California State Department of Transportation (Caltrans) and the California Highway Patrol (CHP) a number of insights regarding the potential effectiveness of different enforcement strategies, engineering changes, and education programs, this experience has not been documented with the quantitative precision necessary to identify the appropriate levels and mixture of these factors needed to obtain adequate motorist compliance. The purpose of the study described in this paper is to provide a detailed, quantitative, and objective assessment of the effect of different enforcement options, engineering features, and educational programs on violation rates for various TSM freeway strategies and to trace the resulting impact of these violation rates on safety, freeway performance, and public attitudes.

STUDY OVERVIEW

As a first step in accomplishing the study objectives, SYSTAN Inc., developed a detailed study design (1) that itemizes project objectives, specifies measures of effectiveness, outlines procedures for data collection and analysis, and provides a structured statistical framework for assessing the effectiveness of different enforcement options, engineering features, and educational programs.

Projects to be Evaluated

Mainline HOV Lanes

In the case of mainline HOV lanes, the different engineering options to be evaluated are limited to the major projects currently in place on California freeways. These projects include the nonseparated right-of-way on Marin RT-101 north of the San Francisco Bay Area; the preferential lane of Interstate 580 in Alameda County, which is separated from regular traffic by a buffer lane; and the 11-mile San Bernardino Busway east of Los Angeles, where the preferential lane is separated from general traffic by concrete barriers on the western end of the freeway and by a buffer shoulder and pylons on the easternmost 7 miles of the project. Detailed descriptions of each of these projects may be found in the study design (1).

Ramp Bypass Lanes

The full range of characteristics of bypass lanes represented on California freeway ramps are being tested to determine their impact on enforcement and violations. More than 130 ramp bypass lanes currently provide preferential access to carpoolers and buses that use Los Angeles freeways; San Diego has 7 such lanes, 3 of which have been installed on freeway-to-freeway connectors. Existing bypass lanes have been classified in groups according to a number of important geometric features, design choices, and performance characteristics, including the visibility of the enforcing officer and the current violation rate. In developing a sampling framework, three levels of officer visibility and ramp violation rates were defined:

Officer visibility--not visible, queue-dependent, and visible.

Ramp violation rates--high, more than 12 percent; medium, 12-6.5 percent; and low, less than 6.5 percent.

The visibility of the enforcing officer is rated from the driver's point of view as he or she enters the ramp. If the enforcing officer can be seen as soon as the driver is on the ramp, enforcement is classified as visible; if the officer cannot be seen until a violator passes the meter, enforcement is classified as not visible; if the visibility of the officer depends on the position of the driver in the queue on the ramp, enforcement is classified as queue-dependent. In addition to ramp violation rates and officer visibility, other classification