

**EXECUTIVE SUMMARY
REPORT 410-1(S)**

OF

**Guidelines for Utilization of Police Officers
In Traffic Control and Enforcement on Urban Freeways**

**Research Report 410-7F
Study 2-18-84-410**

**Cooperative Research Program of the
Texas Transportation Institute**

and

**State Department of Highways and Public Transportation
In Cooperation with the
U.S. Department of Transportation**

September 1986

**Guidelines for Utilization of Police Officers
in Traffic Control and Enforcement on Urban Freeways**

EXECUTIVE SUMMARY

by

**John M. Mounce, Robert W. Stokes, Robert Q. Brackett,
and William R. McCasland**

To safely and efficiently accommodate traffic movement on urban freeways in future years an increasing presence and/or enforcement level by police agencies will be required. The necessity for cooperation between agencies responsible for transportation and law enforcement to bring this about is obvious. This report presents guidelines for the utilization of police officers to optimize traffic control and enforcement for the following areas:

1. Maintenance and Construction. Traffic demands require that traffic control plans provide for high traffic flows through the work zones, while providing for protection of the workers and the safety of the motorists. Acceptable levels of compliance to signs, signals and markings are generally not being achieved using current enforcement strategies.

2. Preferential Facilities for High Occupancy Vehicles (HOV). Often these operations are difficult to understand or resented by those motorists who are not authorized to use the special facilities. Violations of the preferential facilities must be controlled to promote the safety and effectiveness of the operation.

3. Special Transportation System Management (TSM) Techniques. Examples of these are ramp control, truck routes, speed zones, narrow lanes, shoulder conversions, lane reversals, as well as HOV treatments. Adherence to the special regulations associated with these techniques is essential.

4. Normal Traffic Congestion. Traffic congestion has increased to a point that severe delays may be encountered at any time of the day on the transportation networks of major urban areas. Incidents occurring on the freeway system require immediate and decisive responses by enforcement personnel.

The guidelines developed in this research have been categorized as "traffic control" or "enforcement". Traffic control guidelines relate to those situations occurring on urban freeways in which a uniformed officer is needed to reinforce an existing traffic control plan for optimum vehicular movement. The officer functions as an authority figure with the capability of citation; however, for the purposes of traffic control, only the threat of enforcement is necessary.

The second category of guidelines, enforcement, refers to those transportation facilities or techniques which require unique or special restrictions to operate successfully. Compliance with these restrictions is dependent upon the level and effectiveness of active enforcement. These "enforcement" guidelines are not intended in any way as instructions to police officers in how to enforce traffic laws. Instead, the enforcement guidelines are presented to formalize, clarify, and highlight the essential role of police officers in maintaining the operational integrity and safety of these improvements.

Both traffic control and enforcement guidelines are discussed relative to the objectives of police utilization, requirements for implementation, and assessment of effectiveness. Example layouts of possible applications are given for illustrative purposes.

The implementation of guidelines for utilization of police officers in traffic control and enforcement faces numerous difficulties; yet, holds great potential. The institutional, legal, and economic constraints and opportunities which may affect the implementation of the guidelines are identified and discussed.

TRAFFIC CONTROL GUIDELINES

Construction and Maintenance Work Zones

The requirements for traffic control in maintenance and construction zones will vary from site to site. Choice of the appropriate technique and manpower requirements will depend upon the type of work being performed, the length and duration of the work, and the time of day during which the work is being conducted. Typical traffic control plans for a range of freeway maintenance and construction activities are illustrated. These typical set-ups should be useful in developing traffic control plans for maintenance and construction activities likely to be undertaken by transportation agencies in Texas. These layouts should not be considered as standards and in no context do they constitute a "police traffic control plan". Each and every situation on urban freeways with the potential to utilize police officers for traffic control or enforcement must be considered independently. In all cases, the Manual of Uniform Traffic Control Devices (MUTCD) for work zone traffic control devices should be adhered to and police officer traffic control implemented in concert and complement to these standards.

Table S-1 summarizes goals, objectives and measures of effectiveness for the traffic control strategies which may be used in conjunction with maintenance and construction activities.

Major Incident Response

A freeway incident is defined as an accident, mechanical breakdown, cargo spillage, or other traffic event that results in traffic congestion. This study presents general guidelines for use of uniformed police officers for traffic control at major freeway incident sites; where a major incident is defined as one that cannot be effectively managed by a single patrolman or patrol vehicle.

General guidelines for two general incident management strategies (techniques for increasing capacity and techniques for managing demand) are presented. Techniques for increasing capacity in the vicinity of an incident

Table S-1. Goals, Objectives and Measures of Effectiveness for Urban Freeway Maintenance and Construction Traffic Control Strategies Utilizing Police Officers.

Urban Freeway Goal	Traffic Control Objectives	Enforcement Strategies	Measures of Effectiveness
Insure safety of the work zone.	<ul style="list-style-type: none"> ● Maximize safety 	<ul style="list-style-type: none"> ● Maximize visibility of site and personnel ● Position personnel and traffic control devices immediately adjacent to conflict points ● Provide advance warning of work zone 	<ul style="list-style-type: none"> ● Accidents (personal injury and property damage) ● Accident rates ● Conflicts
Maintain acceptable traffic flows through the work zone	<ul style="list-style-type: none"> ● Minimize motorist delays 	<ul style="list-style-type: none"> ● Active traffic control by police personnel in cooperation with the supervising project engineer 	<ul style="list-style-type: none"> ● Travel times ● Speeds ● Length of queues ● Flow rates

include: 1) Use of freeway shoulders; 2) Merging techniques, and 3) Contraflow operations. Demand management strategies include off-freeway diversion and advance warning signs.

Since the primary objective of incident management is to restore freeway traffic services as quickly and as safely as possible, the effectiveness of incident management techniques utilizing police officers should be measured in terms of: 1) How quickly the incident can be cleared and normal traffic services restored; and 2) How effective the techniques are in preventing or minimizing secondary incidents. Table S-2 summarizes freeway incident management traffic control strategies in terms of goals, objectives and measures of effectiveness.

Table S-2. Goals, Objectives and Measures of Effectiveness for Major Freeway Incident Traffic Control Strategies Utilizing Police Officers.

Goal	Objectives	Strategies	Measures of Effectiveness
Protect the incident site	<ul style="list-style-type: none"> ● Minimize secondary Incidents ● Insure emergency vehicle access 	<ul style="list-style-type: none"> ● Maximize visibility of incident site ● Provide advance warning 	<ul style="list-style-type: none"> ● Accidents ● Accident rates ● Emergency veh. response time
Maintain traffic flow and clear incident	<ul style="list-style-type: none"> ● Minimize motorist delay ● Maximize safety 	<ul style="list-style-type: none"> ● Use of shoulders ● Manually-controlled merging ● Contraflow diversion ● Advance warning signs ● Off-freeway diversion ● Pre-planning (types and location of equipment and personnel) 	<ul style="list-style-type: none"> ● Travel times ● Speeds ● Accident rates ● Emergency veh. response times ● Time required to return to normal operations.

Special Events

Many of the basic techniques used in freeway incident management are also applicable to special events. However, since the occurrence of special events is generally known in advance, police officer manpower requirements may be reduced by using transportation agency personnel to implement much of the traffic control plan.

Requirements for traffic control for long-term special events are comparable to those for off-freeway diversion procedures used for major freeway incidents, except such diversion routes are typically of an optional nature. Typical diversion route set-ups for long-term special events are illustrated.

The effectiveness of utilizing police officers in traffic control for special events should be measured in terms of how quickly operations in the vicinity of the event can be restored to normal. The delay experienced by event-generated traffic, as well as the delay experienced by other motorists

as a result of the special event, can be used to assess the overall effectiveness of various traffic control techniques with police agency support.

The general traffic flow goals, objectives and measures of effectiveness presented for freeway incident management strategies (Table S-2) also apply to special event traffic control strategies.

ENFORCEMENT GUIDELINES

Priority Treatment Facilities

The objectives of police enforcement on priority treatment facilities (transitways, concurrent flow lanes, contraflow lanes, HOV by-pass ramps) are to maintain the operational integrity and safety of the facilities. Consequently, a strict and active enforcement program is necessary. Detection and apprehension, issuance of citations, and effective means of discouraging violations are essential.

For HOV by-pass ramps, the police officer should have a clear view of the ramp so that determination of vehicle occupancy can be made. A safe and accessible refuge area bordering the by-pass ramp should be provided for citation of violators.

For priority treatment facilities which do not have full access controls and/or are not physically separated from the general use freeway lanes, tandem enforcement at strategic locations along the facility may be applicable. In this technique, one officer detects violators and a second officer stationed downstream apprehends and cites violators. Typical set-ups for priority treatment enforcement procedures are presented.

Table S-3 summarizes goals, objectives and measures of effectiveness for priority treatment enforcement techniques.

Table S-3. Goals, Objectives and Measures of Effectiveness for Priority Treatment Enforcement Strategies.

Goal	Objectives	Strategies	Measures of Effectiveness
Maintain operational integrity	<ul style="list-style-type: none"> ● Minimize travel times ● Maximize vehicle occupancy levels ● Minimize violation rates 	<ul style="list-style-type: none"> ● Strict enforcement of occupancy requirements ● Clear communication of nature of facility ● High visibility of enforcement officers ● Swift, safe removal of violators 	<ul style="list-style-type: none"> ● Violations ● Violation rates ● Travel times
Maintain safe operations	<ul style="list-style-type: none"> ● Minimize accidents ● Minimize incident response and clearance times 	<ul style="list-style-type: none"> ● Strict enforcement of authorization requirements ● Clear communication of nature of facility ● Swift, safe removal of violators 	<ul style="list-style-type: none"> ● Accidents ● Accident rates ● Incident response and clearance times

Transportation System Management Operations

Transportation system management (TSM) strategies typically involve short-term improvements directed at making more efficient utilization of the existing transportation system. Basically, TSM methods are actions or groups of actions intended to produce shifts in the supply-demand equilibrium of the transportation system. Many of these strategies involve a rearrangement of physical facilities and/or operating practices, requiring users to face new situations and to learn new rules. Consequently, the success of many TSM strategies, such as ramp metering, commercial vehicle routing, speed zoning, lane restrictions, and shoulder usage, depends, in large part, on the effectiveness of the enforcement program which accompanies them.

There are three basic enforcement strategies which may be used in conjunction with TSM projects: 1) Routine enforcement; 2) Special enforcement; and 3) Selective enforcement. Specific enforcement procedures for TSM projects may include one or more of the following types of patrol: 1) Line patrol; 2) Zone patrol; and/or 3) Stationary patrol. In addition, the TSM enforcement process may include one or more of the following apprehension and citation procedures: 1) Standard; 2) Stationary; and/or 3) Signaling. Line and stationary patrols with standard or stationary apprehension and citation methods are the most commonly used enforcement procedures associated with TSM improvement projects.

As with priority treatment facilities, the effectiveness of TSM enforcement activities may be evaluated in terms of compliance with posted restrictions and regulations. Even low levels (i.e., one officer per week per month) of special enforcement may significantly reduce violations on most TSM projects. Moreover, the residual effects of active enforcement on TSM facilities have controlled the violation rates for 4-8 weeks after cessation of the special enforcement activities.

Table S-4 summarizes goals, objectives and measures of effectiveness for selected TSM project enforcement strategies.

IMPLEMENTATION ISSUES

The implementation of the guidelines developed requires first that some dissemination mechanism exist to place the guidelines in the appropriate hands. Second, there must be some means of training available to instruct police officers in the use of the guidelines. Finally, there must be some command or control structure to ensure that the guidelines are implemented.

In addition to the issues of dissemination, training and implementation, discussions with law enforcement officials, the review of the literature and the experience of the staff produced ancillary questions that might need to be resolved before the traffic control and enforcement guidelines can be successfully implemented. These issues can be categorized as: 1) institutional, or those dealing with the internal and external orientation and

Table S-4. Goals, Objectives and Measures of Effectiveness for Selected TSM Project Enforcement Strategies.

System Goal	Transportation Mgmt. Objectives	Enforcement Strategies	Measures of Effectiveness
Manage System Demand	<ul style="list-style-type: none"> ● Meter freeway input (ramp metering) ● Reduce commercial vehicle congestion (commercial vehicle routing) ● Segregate vehicle types (Lane restrictions) ● Reduce incidents and conflicts (e.g., speed zoning) 	<ul style="list-style-type: none"> ● Strict enforcement of ramp metering ● Strict enforcement of truck/commercial vehicle route regulations ● Strict enforcement of lane restrictions ● Strict enforcement of speed limits ● High visibility of enforcement officers ● Institution of selective enforcement programs 	<ul style="list-style-type: none"> ● Violations ● Violation rates ● Travel times
Increase system capacity	<ul style="list-style-type: none"> ● Maximize capacity (Shoulder usage) ● Minimize travel times 	<ul style="list-style-type: none"> ● Institution of selective enforcement programs 	<ul style="list-style-type: none"> ● Travel times ● Accident rates ● Flow rates

relationships of law enforcement agencies; 2) legal, or those issues dealing with the responsibility to enforce and the legality of enforcement techniques; and 3) economics, or those issues related to manpower and funding.

Each of the two areas described in the guidelines has certain characteristics that are somewhat unique in the realm of traffic law enforcement. The control of traffic through work zones, for example, requires using officers in a non-enforcement oriented role. On the other hand, traffic law enforcement on priority treatment facilities and TSM projects requires typical enforcement strategies and tactics.

Although in some instances the same implementation issues apply to both work zone traffic control and priority and TSM enforcement, the two areas are addressed separately in the research report.

Again, these issues are not critical to the implementation of the enforcement guidelines. They simply represent problems that may arise. It is not the intent of the information presented to provide solutions to specific problems; rather they are intended to provide a basis for discussion during implementation planning sessions in order that they may be addressed and resolved by participating agencies.

RECOMMENDATIONS

For guidelines to be effective they must be implementable. Section 4 of the research report discusses many of the issues and problems that must be resolved if wide-scale application of the guidelines is to be achieved. The following recommendations are submitted for the purpose of achieving this goal.

1. Approval of Guidelines - The guidelines as presented in this report are necessarily broad and general to accommodate the large number of variables that must be considered. There is much work left to the "engineer" or "officer-in-charge" to make the guidelines site specific. However, the concepts that these guidelines represent need to be reviewed and approved by state and local agencies that will be responsible for their use.

It is the recommendation of this report that the guidelines as formulated be presented to designated state and local agencies for their review and approval.

2. Dissemination of Guidelines - The guidelines must be made available to those who will use them in a form that facilitates their use. There are at least three groups that should be considered; the police agencies, the transportation agencies and the construction and maintenance agencies. The guidelines should be restructured to address the specific requirements of these groups.

It is the recommendation of this report that the State prepare supplemental reports, training courses, informational case studies and other informational materials for use by the agencies responsible for implementation. Since the emphasis of the guidelines is on the police agency, it is important to establish a forum for their presentation. Preliminary consultations indicate that incorporation of the guidelines into the basic law enforcement certification course may not be feasible at this time. Other training opportunities, therefore, must be investigated.

3. Implementation of Guidelines - A number of implementation issues are discussed in Section 4. Some of the issues are critical to implementation; others are not. It is the recommendation of this report that the State undertake the study of these issues with the purpose of achieving statewide acceptance of the guidelines. These issues are broadly described as institutional, legal and economic.

In addition to this Executive Summary, the following summary reports are available:

- Rept. 410-2(S) - "Summary of Traffic Control Guidelines for Construction and Maintenance Work Zones";
- Rept. 410-3(S) - "Summary of Enforcement Guidelines for Priority Treatment Facilities";
- Rept. 410-4(S) - "Summary of Enforcement Guidelines for TSM Operations";
- Rept. 410-5(S) - "Summary of Traffic Control Guidelines for Major Incident Response"; and
- Rept. 410-6(S) - "Summary of Traffic Control Guidelines for Special Events".