

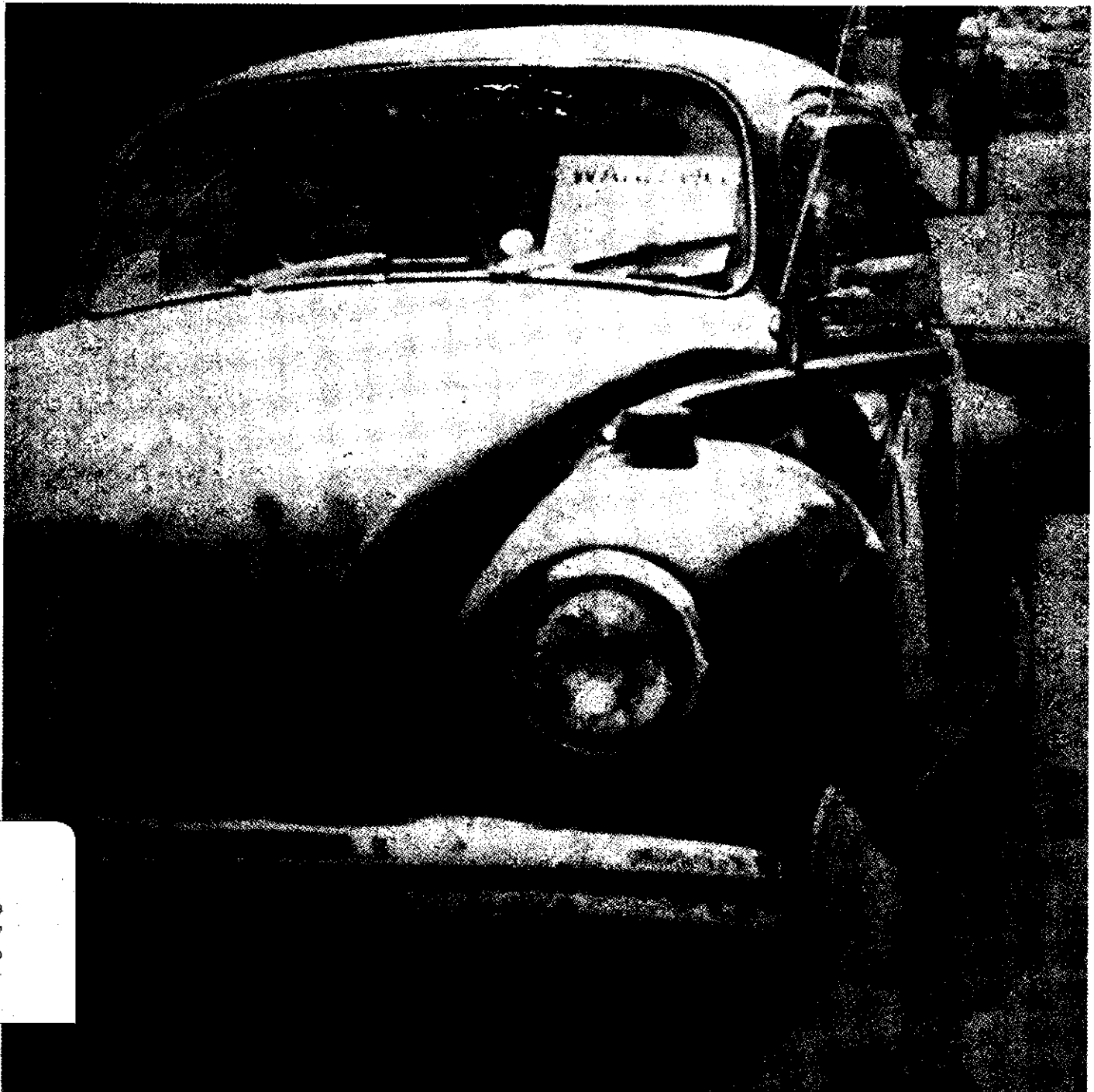


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Enforcement of Transportation Systems Management Strategies: Four Case Studies

September 1980

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Enforcement of Transportation Systems Management Strategies: Four Case Studies

Prepared by
Center for Transportation Studies
Massachusetts Institute of Technology
Cambridge, Massachusetts 02139

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16. Abstract <p>With the recent focus in transportation planning on obtaining a more efficient utilization of the existing transportation system, many agencies unaccustomed to playing a major role in transportation planning and implementation become of critical importance in successful project development. This report examines the role (and the obstacles of playing such a role) of enforcement agencies in the Transportation System Management (TSM) planning process. Four transportation projects in Boston-- a preferential lane on an expressway, a center city auto restricted zone, residential parking permit programs, and towing/booting enforcement--were used to illustrate the importance of enforcement in successful project implementation. The research concludes that there are several institutional barriers which hinder effective police participation in the project planning process; that in general, police representation somewhere in the project development process was deemed necessary by police officials; that in the case of Boston, the police agencies provided most useful technical information to project planners; and that strong enforcement should begin immediately at project initiation and then taper off to be reapplied when necessary. It is recommended that local transportation agencies provide opportunities for police participation in project planning, with the needed financial support if necessary.</p>					
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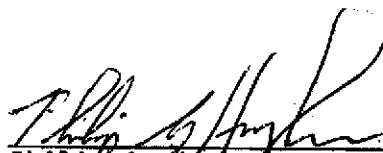
A number of Transportation System Management (TSM) tactics, such as High Occupancy Vehicle lanes, residential parking permit programs, parking policy changes and auto restricted zones, require enforcement if they are to be successful. These tactics can be quite effective in addressing such goals as reducing bus travel times, increasing auto occupancy, minimizing neighborhood impacts, and downtown revitalization. Yet inadequate attention to enforcement can result in many problems with their implementation. To assist planners and others interested in considering implementing various TSM tactics, UMTA through its University Research and Training Program initiated a study of enforcement of TSM tactics by the Massachusetts Institute of Technology. The purpose of this study was to investigate the role of enforcement in various TSM strategies by doing case studies of a number of implemented projects.

This document presents the results of this study. It summarizes the case studies which involved assessment of an HOV lane, an auto restricted zone, a residential parking permit program and a booting and towing parking enforcement program. In addition, several conclusions about the role of enforcement in TSM are drawn. We believe that this review will be of interest to all who are considering implementation of TSM-type tactics.

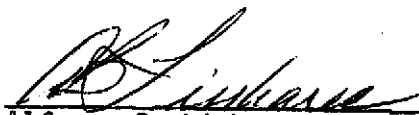
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Charles H. Graves
Office of Planning Assistance
Urban Mass Transportation
Administration
US Department of Transportation
Washington, DC 20590



Philip G. Hughes
Office of Policy Research
Urban Mass Transportation
Administration
US Department of Transportation
Washington, DC 20590



Alfonso B. Linhares
Office of Technology Sharing
Office of the Secretary
US Department of Transportation
Washington, DC 20590

TABLE OF CONTENTS

	<u>Page</u>
I. TRANSPORTATION PLANNING AND ENFORCEMENT: THE CONTEXT . . .	2
II. TRANSPORTATION AND ENFORCEMENT IN BOSTON	4
III. CASE STUDY A: THE SOUTHEAST EXPRESSWAY RESERVED LANE . . .	8
The Enforcement Problem	8
The Planning Stages	8
Implementation	10
Case Summary and Interpretation	16
IV. CASE STUDY B: THE DOWNTOWN CROSSING	17
The Enforcement Problem	17
Round 1: The Early Stages	20
Round 2: Implementation	21
Case Summary and Interpretation	23
V. CASE STUDY C: BOSTON AREA RESIDENT PERMIT PARKING PROGRAMS	24
Residential Parking in the Boston Area	25
Cambridge RPPP	26
Boston Neighborhood RPPP's	28
Case Summary and Interpretation	31
VI. CASE STUDY D: "DENVER BOOTING" IN BOSTON	31
Planning	32
Procedure and Problems	33
Excise Tax Collection	33
Results	34
Interdepartmental Relationships	34
Future Developments	34
Case Summary and Interpretation	36
VII. PARKING ENFORCEMENT	36
VIII. CONCLUSIONS	40

LIST OF FIGURES

	Page
Figure 1 - Boston Police Organization	6
<u>Case Study A: The Southeast Expressway Reserved Lane</u>	
Figure A-1 - Letter Sent To Lane Violators	11
Figure A-2 - Travel Time Information For The Reserved Lane Project	13
Figure A-3 - Violation Rules For Reserved Lane	14
<u>Case Study B: The Downtown Crossing</u>	
Figure B-1 - Downtown Crossing And The Boston Environs	18
<u>Case Study C: Boston Area Resident Permit Parking Programs</u>	
Figure C-1 - Location of Residential Permit Programs in Boston	30
Figure 2 - Washington D.C. Turnover Study Comparisons	38

LIST OF TABLES

	Page
Table A.1 Accident Information On The Southeast Expressway	15
Table D.1 Relation of Tow And Hold Activity To Ticket Revenues At Boston Municipal Court	35

Enforcement of Transportation Systems Management Strategies:
Four Case Studies

by

Michael D. Meyer and James Sheldon-Dean

Urban transportation planning in the United States has undergone tremendous change during the past two decades. Most recently, transportation planning has experienced a pronounced shift toward planning that is service-oriented (rather than facility-oriented), that involves relatively inexpensive actions, and that seeks through operational changes the most efficient use of existing facilities [1]. This shift in focus was first formally introduced into the transportation planning process by the joint Transportation System Management (TSM) planning regulations of the Urban Mass Transportation Administration (UMTA) and the Federal Highway Administration (FHWA) in September, 1975 [2]. One consequence of this type of planning is that it requires the participation of actors which never thought of themselves as being related to transportation planning because of the previous long-range focus and the general disregard for implementation concerns of such efforts. The purpose of this research is to examine the role of one such group of actors, those agencies that are responsible for enforcing the TSM actions once they have been implemented.

TRANSPORTATION PLANNING AND ENFORCEMENT: THE CONTEXT

There are several examples in the transportation sector which illustrate the enforcement component of TSM projects. In Miami, where minimal enforcement was provided for a preferential lane project on a major freeway in the region, the percent of vehicles not complying with the mandated occupancy level reached 75 percent [3]. Police enforcement of the Santa Monica diamond lane experiment kept the violation rate to "only" 10 to 20 percent [4]. In Boston, a "self-enforcing" voluntary diamond lane experienced a violation rate of greater than 80 percent [5]. When police began ticketing violators through the mail, the violation rate fell to 35 percent (and the resulting congestion in the general use lanes became so unacceptable to expressway users that through political pressure they terminated the project). At a recent meeting of the regional TSM committee in Boston, a planner describing a recently implemented auto restricted zone stated that the enforcement campaign had been the biggest factor in the ARZ's success to date. In Washington D.C., an innovative parking enforcement program has played a major role in controlling the illegal use of parking space and maintaining traffic flow [6].

The literature in transportation planning very seldom mentions the role of enforcement in project planning. In fact, a recent review of the literature, along with interviews of TSM planners in 18 U.S. cities, found that [7]:

1. Most police agencies consider traffic enforcement measures solely as a means to reduce accidents or improve the safety conditions of a specific facility. The use of enforcement to achieve other objectives, e.g., improve traffic flow or reduce parking availability, has not been found in the literature.

2. The transportation agency most often cited as having some interaction with the police department is the traffic engineering department. This interaction was most necessary for accident prevention and other safety related issues. Very little evidence was found of cases where the police participated on an ongoing basis in a transportation planning process.

3. An effective enforcement program encompasses more than just the police agency; it also includes the courts, state licensing agencies, and transportation implementing agencies.

4. Administrative adjudication has been utilized in some cases to relieve the heavy load of traffic cases that the courts must hear. This has provided speedier, less expensive disposition of traffic cases.

5. The important role of enforcement in parking management strategies has received the most attention in the transportation literature. Most authors, however, have simply commented on the necessity for enforcement and do not examine reasons why it might not occur.

6. Recent attention to the success and failure of high occupancy vehicle (HOV) lanes has pinpointed enforcement as a critical factor in the operation of the facility. A concern over the safety of the police officer, a lack of resources to undertake such an effort, and the non-involvement of the police agency in the project design phase have contributed to a hesitancy on the part of the police to enforce HOV lanes.

7. Those TSM plans that do mention enforcement include it as a component of specific projects. Very few mention enforcement as a TSM strategy in its own right.

8. Very few TSM planners consider enforcement during the planning process. Most planning for specific TSM projects assumes that the project will be enforced, and that the specifics of the enforcement strategy will be worked out between the police agency and the implementing agency.

All of these examples underscore one important lesson--if we are truly serious about managing the existing transportation system, we cannot ignore enforcement as a strategy that potentially has the highest payoff. And yet very few TSM planners consider problems of enforcement during the planning process. Further, representatives of enforcement agencies are not actively

involved in the planning of such projects. These findings lead to some very interesting research questions about what role enforcement agencies should have in the TSM planning process.

- . What are some of the institutional constraints that limit the participation of enforcement agencies in the transportation planning process?
- . How do police representatives view their involvement (or lack thereof) in the planning process?
- . What information or technical capabilities do enforcement agencies have that could complement existing planning approaches?
- . How can transportation agencies at all levels of government contribute to an increased role for the police?
- . How do the characteristics of an enforcement strategy relate to project implementation?

To answer these questions, case studies were conducted on four TSM projects in the Boston metropolitan area--a preferential lane on a major expressway, an auto restricted zone in the center city, a residential permit parking program, and a parking enforcement program. [8] The results of these case studies follow.

TRANSPORTATION AND ENFORCEMENT IN BOSTON

Transportation has long been a concern in the Boston region. With the oldest subway in the nation (1897), the second oldest in the world, and an early growth pattern based on street car lines, Boston has maintained a reputation for professional transportation studies that have been judged quite competent and advanced for their time. In the late 1960's, however, plans to build several major highways in the central city area drew the opposition of several community groups with the result being a major restudy of the transportation system--the Boston Transportation Plan Review (BTPR). The importance of the BTPR to this research is the impact it has had on the attitudes and problem-solving approaches of the region's transportation professionals. As a result of the Governor's moratorium on the construction of the proposed highways, service-oriented solutions to the transportation problem were considered for the first time as serious alternatives to the construction of new facilities.

Service-oriented planning in Boston was thus encouraged by the so-called "highway revolt." Two characteristics of this type of planning have been identified in a recent study as having strong influence in later attempts to formalize a planning process based on transportation system management concepts.

1. The service-oriented concepts that emerged from the planning

arose as "new ideas," creative ways to deal with stalemate conditions. However, they were not the creation of the professionals who usually dealt with traffic management activities.

2. Although the BTPR was a capital-oriented process, some transportation professionals for the first time were exposed to service-oriented planning. Some of the regional transportation planning staff were thus familiar with many of the TSM concepts that were listed in the joint planning regulations.

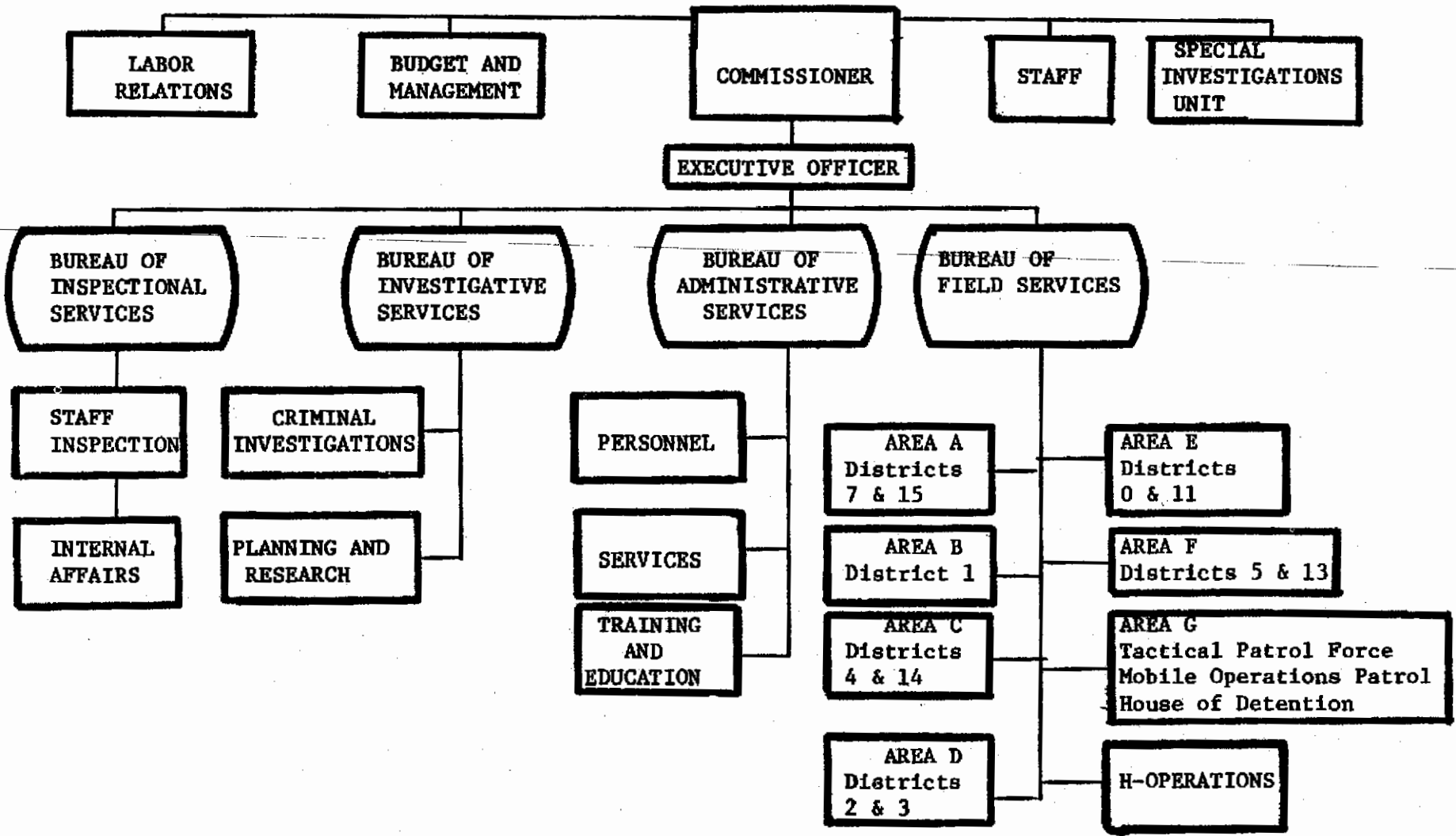
The recent history of transportation planning in Boston thus includes the kernel of an institutionalized focus on short-range, service-oriented TSM planning.

Along with the reputation for innovative transportation planning, Boston is also considered to have one of the most complex institutional structures for such planning of any city in the country. Each of the 101 cities and towns in the region has the opportunity for input into the transportation planning process. The formal organizations with responsibility for transportation planning and system operations are also numerous and actively participate in regional transportation discussions. Although such an institutional structure would seem to preclude any attempts at coordination, efforts have been made in recent years to set up organizational mechanisms that could at least provide policy guidance to other agencies.

In response to the federal requirement for an MPO, the Boston transportation agencies (under the guidance of the Secretary of the State DOT) established an MPO consisting of the heads of six agencies: the Executive Office of Transportation and Construction (EOTC), the Massachusetts Department of Public Works (MDPW), the Massachusetts Bay Transportation Authority (MBTA), the Metropolitan Area Planning Commission (MAPC), the Advisory Board to the MBTA, and the Massachusetts Port Authority (Massport). Except for the Advisory Board to the MBTA (which consists of the chief executive officer or designee of each town in the MBTA service area) and MAPC, the MPO is dominated by state agencies and authorities. As the MPO, these agencies oversee and direct the urban transportation planning process which includes developing and endorsing various plans and programs required by federal regulations.

There are three major groups of enforcement agencies in the Boston area -- the Metropolitan District Commission (M.D.C.), the State Police (under the auspices of the State Department of Public Safety), and local police forces. The M.D.C. has primary responsibility for patrolling the parkways in its district, although the state legislature has also given it responsibility for segments of some state highways. The local police agency of most concern to this study is the Boston Police Department, a major actor in three of the four projects examined in later sections. The Department is structured in a hierarchical fashion with Commissioner and other major officials wielding great influence on the day-to-day operations of individual officers (see Figure 1). The command structure (the Department is in essence a paramilitary organization) is very rigid and control is exercised through the field supervisors.

The Boston Police Department at one time had a Traffic Control Bureau,



Boston Police Organization

Figure 1

but this was disbanded due to fiscal pressures. The Department decided that a police officer was too expensive to train and maintain on the force just to control traffic. The traffic enforcement function of the Police Department has therefore been combined with the other duties of the police officer. The difficulties this poses for effective enforcement is that the priorities of the Police Department relate almost exclusively to public safety with crime prevention receiving most emphasis. A towing program has been instituted, however, to remove vehicles blocking intersections or fire hydrants and to apprehend those drivers who have not paid their parking fines (this will be discussed in greater detail in a later section).

Another characteristic of the police agencies in Boston is that they appear to be relatively isolated from the rest of the state and city government. There are very few formal links between the police agencies and other government agencies which means that much of the interaction between police and transportation agencies occurs on a project-by-project basis. One exception to this is the Boston Police Department where the commissioner is a member of the Public Improvements Commission which also includes the Commissioners of Public Works, Traffic and Parking, Real Property, the Building Department, and the Fire Department. Any major physical improvements made in the city are presented at the Public Improvements Commission and the responsibility of each agency is discussed. The Police Commissioner's Office then sends notices of these projects and any special circumstances to the Area Commander in whose district the project is being constructed. This process, however, puts most agencies, and particularly the Police Department, in a reactive mode, i.e., the Commissioner can point out problems with the proposed project after it has already been examined. There is very little opportunity for police input during the initial consideration of the project.

In summary, the Boston area is known nationally for its innovative approaches to transportation problems. However, the Boston region is also characterized by jurisdictional fragmentation and a complex institutional structure for transportation planning. The police agencies are somewhat isolated from this institutional structure and tend to participate in the process on a project-by-project basis. The police agencies are organized hierarchically and have a very firm control/authority structure. Although police officers have a responsibility for enforcing traffic regulations, this duty must compete with the other (and more important from the perspective of the Police Department) priorities.

The courts in the Boston area play an important role in the projects in this case, even though they are not involved in the planning for the projects. Boston courts have never felt that traffic law enforcement is one of their high priority tasks, and justifiably so, considering the weight of other court responsibilities and current court backlog. Penalties have historically been low, even in extreme cases, and extra penalties for non-payment of parking tickets are rare, even though such penalties are allowed by the law. The courts operate under conditions which make inter-agency cooperation difficult, in that tasks that interface with other agencies, such as mailing of summonses for overdue parking tickets and processing fines for tickets mailed in, are understaffed and underequipped for the magnitude of the work.

At the same time, the courts are reluctant to give up any of their power in the traffic law enforcement area. Only recently has the Boston Municipal Court, which handled 60 percent of the parking violations, given its support to the proposal for a Parking Violations Bureau in Boston which would assume almost all of the adjudication duties presently held by the courts. The courts' role in traffic law enforcement, then, is characterized by a lack of resources and a reluctance to change.

CASE STUDY A: THE SOUTHEAST EXPRESSWAY RESERVED LANE

The Southeast Expressway is the most heavily congested roadway in Massachusetts and has received during the past 20 years increased attention from local transportation planners and engineers as to possible ways of decreasing the burden on this major highway serving the Boston metropolitan area. The Expressway has also become the focus of often times heated public debate as these different attempts at solving the "Expressway problem" have created perceived negative impacts on several constituent groups. The Southeast Expressway Reserved Lane was the latest, and most controversial, effort to improve the performance of the Expressway. The purpose of this case study is to examine the role of the enforcement agencies in the planning and implementation of the Lane with special attention given to the problems of such a scheme as perceived by those responsible for enforcement. [10]

The Enforcement Problem

The type and extent of enforcement in the Southeast Expressway Reserved Lane project was influenced by several factors. First, the Reserved Lane removed an existing lane from general purpose use without providing for additional capacity, thus one could have expected (and, as it turned out, it did occur) large numbers of drivers attempting to circumvent the resulting congestion in the remaining general purpose lanes by using the express lane. The enforcement of the Lane, therefore given this large potential for violations, would have to be on an extensive scale. Second, the eight-mile Reserved Lane was to be separated from the general use lanes by 19-inch plastic posts spaced 20 feet apart in heavily congested areas and 40 feet apart in remaining areas. Given that there was no physical separation between the preferential and non-preferential lanes, the safety risks of cars weaving in and out of the Reserved Lane were quite high. Third, there was no space along the length of the project where violators could be pulled over and ticketed. Enforcement control of the Lane would thus have to occur at the beginning or end of the project. Finally, the project extended through two police agency jurisdictions which required that some effort be made to coordinate the activities of both agencies.

The Reserved Lane -- The Planning Stages

The planning for the Reserved Lane began almost two years before it was actually implemented and involved most of the transportation agencies in the Boston region. The Massachusetts Department of Public Works (MDPW) was the key agency involved with the project in that it was responsible for the operation of the Southeast Expressway. Starting in November, 1976 weekly meetings were

held under its auspices with the other affected agencies to coordinate preparations for Lane implementation. These other agencies included the Executive Office of Transportation and Construction (EOTC) which is the state Department of Transportation and whose officials were the major proponents of the Lane; the Massachusetts Bay Transportation Authority (MBTA) which is responsible for operating public transportation in the Boston region; and the Metropolitan District Commission and the State Police, both agencies responsible for policing specific highways in the region.

The original rationale for the Lane was for it to help achieve the objectives of the transportation program in the Boston region. In particular, the major proponents of the project were viewing the Lane as a very visible and effective means of showing the region's commitment to Transportation System Management (TSM) and air quality/energy conservation objectives. Other transportation officials, however, were skeptical about the feasibility of the Lane. The MDPW officials argued that the engineering considerations of actually implementing the project were formidable, while police officials stated that given its design characteristics, the Lane was unenforceable. Perhaps more importantly, the opportunity for cars to weave in and out of the Lane created serious safety problems.

Because no consensus could be reached on these important issues, the implementation of the reserved lane was postponed. However, the concept was soon to receive new impetus with the impending reconstruction of portions of the bridge decks on the northern segment of the Expressway. This reconstruction work was expected to cause serious congestion on the Expressway, and there were few options available to transportation officials for alleviating this pressure.

Because the Reserved Lane was one strategy that could increase passenger flow on the Expressway without major changes, given the benefits of linking the Reserved Lane concept more closely in the public's eye with the Expressway reconstruction, and realizing that the lower traffic volumes during the summer would make the self-enforcement much easier, state transportation officials decided that the Reserved Lane would be implemented.

In late 1976, the Department of Public Works began a series of weekly meetings which included all the agencies having some responsibility in the Reserved Lane project. It was decided early in the process that driver compliance to the Reserved Lane would be on a voluntary basis because:

- "1. The voluntary approach simplified the legal requirements for implementation and enforcement of the Express Lane project.
2. Public acceptance of a voluntary lane would be greater and the concept could be proven without alienating those opposed to the project at the start. The responsibility for the success or failure of the project was, therefore, shifted to the general public (and each commuter then using the Expressway) and away from a focus on the police's ability or right to enforce the three-occupant carpool requirement." [11]

The role of the policing agencies was thus to be limited to assisting in accident situations and traffic control, which was the role both agencies were satisfied in playing.

Representatives from the M.D.C. and State Police agencies attended the weekly meetings at the Department of Public Works and reported on their efforts to increase their capability to respond to any incidents on the Expressway. The M.D.C., for example, increased the total number of vehicles available for patrol and tow from seven to 14 vehicles. The State Police were to provide four vehicles for patrol on the Expressway during the operation of the Reserved Lane. Many times at these meetings, however, police representatives expressed the concern that had worried them throughout the planning stage--the possibility of serious accidents occurring from vehicles weaving in and out of the Reserved Lane. Police representatives repeatedly suggested that some procedure be adopted that would result in some respect for the cones. The M.D.C. representative suggested sending repeat violators a letter to the effect that their action had been reported to the Registry of Motor Vehicles for disciplinary measures. He also requested that Reserved Lane press releases should emphasize the fact that while compliance was voluntary, non-compliance was in fact a violation. Both of these suggestions were adopted.

In summary, both the M.D.C. and State Police agencies played an active role during the planning of the Reserved Lane. Both agencies, however, were of the opinion that 1) the Lane was unenforceable and 2) there were serious safety problems associated with the weaving of automobiles in and out of the Lane. But because the decision had been made to go ahead with the project the agencies were very cooperative in designing a strategy for effective implementation.

The Reserved Lane -- Implementation

When finally implemented on May 4, 1977, the Reserved Lane extended along an eight-mile stretch of the Southeast Expressway and was reserved for buses and three-or-more-occupant carpools. During the early days of operation, the results were close to those expected--the travel times in the Reserved Lane decreased (between 20 and 40 percent), travel times in the regular lanes increased (by 40 percent), the number of carpools on the Expressway increased (by about 33 percent), and the non-compliance rate was high (the percentage of legal users of the Lane ranged between 22 and 41 percent). The high non-compliance rate was of serious concern to transportation officials because it not only negatively affected the ability of the Lane to handle high-occupancy vehicles but also encouraged auto drivers caught in the congested regular lanes to weave into the Reserved Lane. Indeed, the violation rate increased steadily until by the end of May it was decided that some enforcement effort had to be made.

Two major changes were made at the end of May which were designed to improve the compliance rate. First, the State began recording the license plate numbers of violators and sent them letters requesting that they comply (see Figure A-1). Second, additional plastic inserts were placed in those sections which experienced the highest rate of weaving movements. Signs were posted noting the weaving restriction and the police began to enforce it. The enforcement and compliance observation was accomplished by having police cruisers traveling in the lane nearest to the Reserved Lane which provided the police officer with good opportunities to observe auto behavior in the Lane. The results of these enforcement efforts, however, were discouraging.



The Commonwealth of Massachusetts

Executive Office of Transportation and Construction

Department of Public Works

Office of the Commissioner

100 Nassau Street, Boston 02114

Dear

Your vehicle, Mass. Registration # _____, has been observed violating the intent of the Downtown Express Lane on the Southeast Expressway, a lane provided for use by buses and 3 or more occupant vehicles.

The purpose of this Express Lane is to mitigate some of the congestion which would ordinarily result from the construction project at the Massachusetts Avenue interchange. Unless we are able to provide an incentive for carpool formations and increased use of buses, it would be impossible for the expressway to function at a tolerable level of service during this year's construction season. The reserved lane concept, if successful, will benefit all expressway users, since each new carpool or bus rider will reduce the number of vehicles in the general purpose lanes.

You, or the person who drives your car, add to the very small percentage of violators who can undermine this project to the detriment of all the expressway commuters.

We ask that you discontinue use of this lane, or better still, form a carpool, if possible.

Very truly yours,


JOHN J. CARROLL
Commissioner

Letter Sent To Lane Violators

Figure A-1

By early October, the reconstruction work on the Expressway was completed. However, transportation officials had already decided to continue the Lane past the reconstruction stage because they were convinced that the concept had been successful in increasing the productivity of the Expressway and that it was now accepted by the commuters as a viable use of road space. It was further decided that if the Lane were to have a major impact on travel in the corridor, it was essential that it be enforced and that fines be levied against those in violation.

The decision to enforce the Lane once again created problems for the police agencies. The police agency representatives still maintained that the Lane was unenforceable, except for sending citations through the mail and they were uncertain as to the legality of this action. It was not until a local judge agreed that the mailing of citations was acceptable that the police agencies agreed to enforce the regulation. The regulation, similar to one already used by the Massachusetts Turnpike Authority in enforcing toll payment, stated that:

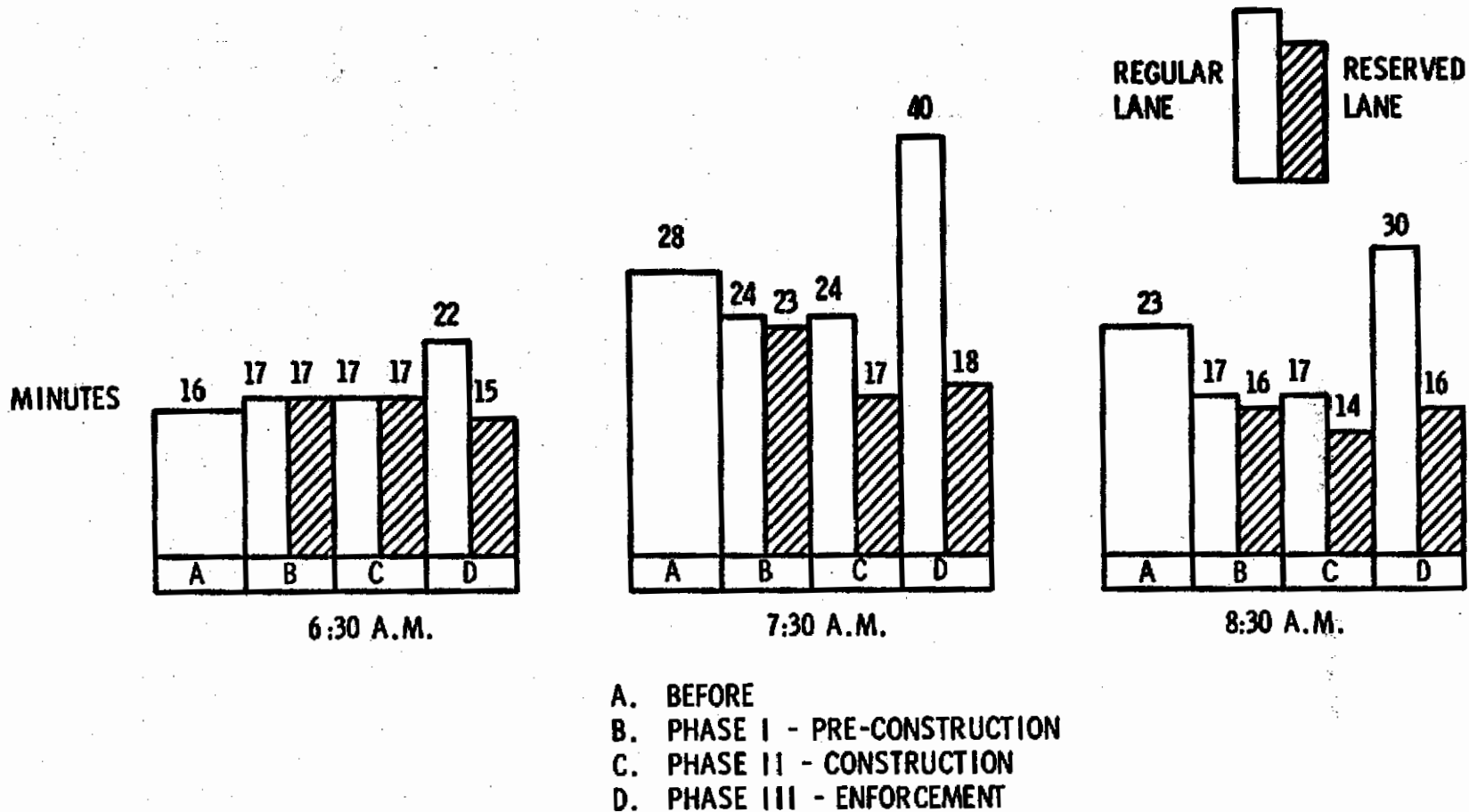
" . . . where a violation is observed by a police officer and the officer is unable to give the original of the citation to the violator at the time of such offense because the violator could not have been stopped or the failure is justified for some other reason . . . the citation shall be issued to the registered owner's last address as appearing in the records of the Registry of Motor Vehicles." [12]

This regulation also provided for a maximum fine of \$20 payable by the owner of the car in non-compliance.

This new phase in the Lane operation began on October 17, 1977 and almost immediately there was a public outcry against the project. Several legislators introduced one bill which would have prohibited the DPW from continuing the Lane and another bill which would have decreased the occupancy requirement for the Lane from three plus to two or more persons, an action that would have effectively killed the project. On November 2, 1977, the DPW Commissioner announced the immediate termination of the project. All citations that had been issued during the enforcement period were dismissed.

One of the ironic results of the enforcement strategy in this latter phase of the Lane operation was that its success could have been a major cause for the controversy surrounding the project and its eventual termination. As shown in Figure A-2, once the Lane was enforced travel times increased significantly in the remaining three lanes creating severe levels of congestion. The Reserved Lane violation rate also decreased significantly (see Figure A-3). One could conclude therefore that the enforcement strategy was indeed successful in making the Reserved Lane operate more effectively by discouraging violators from using the Lane. However, the resulting congestion and delays to the other users of the Expressway created a high degree of controversy that eventually caused the project to be abandoned.

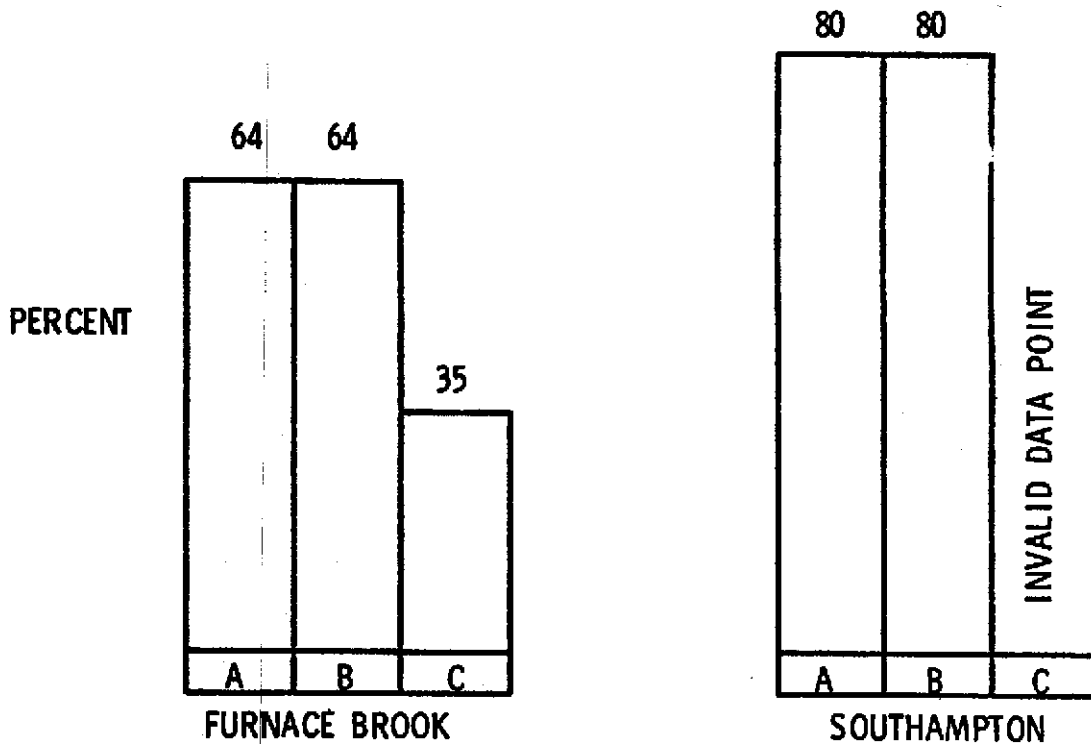
The accident information from the project evaluation is inconclusive and does not seem to support police fears of high levels of accidents attributable to the project. As shown in Table A.1, the accident figures fall within the



11.4 MILE SEGMENT (UNION TO KNEELAND)

Travel Time Information For The Reserved Lane Project
Figure A-2

Source: Howard Simkowitz, Southeast Expressway High Occupancy Vehicle Lane Evaluation Report, UMTA-MA-06-0049-78-4, Transportation Systems Center, U.S. DOT, May 1978.



- A. PRE-CONSTRUCTION
- B. CONSTRUCTION
- C. ENFORCEMENT

6:30-9:30 A.M.

Violation Rates For Reserved Lane

Figure A-3

Source: Howard Simkowitz, Southeast Expressway High Occupancy Vehicle Lane Evaluation Report, UMTA-MA-06-0049-78-4, Transportation Systems Center, U.S. DOT, May 1978.

TABLE A.1

ACCIDENT INFORMATION ON THE SOUTH-
EAST EXPRESSWAY

<u>Period</u>	<u>Personal Injury Accidents</u>	<u>Property Damage Accidents</u>
May 1970 - 1976		
Range	0 - 9	2 - 8
Average	3.0	4.7
May 1977	6	6
June 1970 - 1976		
Range	1 - 4	4 - 12
Average	2.3	6.7
June 1977	3	10
October 17 - November 2 1970-1976		
Range	1 - 3	2 - 5
Average	1.7	2.9
October 17 - November 2 1977	1	8

Source: Howard Simkowitz, Southeast Expressway High Occupancy
Vehicle Lane Evaluation Report, UMTA-MA-06-0049-78-4,
Transportation Systems Center, U.S. DOT, May 1978

historical range of the data, except for the number of property damage accidents during the enforcement phase (October 17 - November 2). These figures should be considered a lower estimate because it has been observed that many minor accidents on the Expressway are never reported.

Case Summary and Interpretation

The Reserved Lane on the Southeast Expressway is perhaps the best example of the role of enforcement agencies in the planning of innovative projects. The two police agencies involved -- the Metropolitan District Commission and the State Police -- cooperated in the project planning process although they oftentimes expressed severe reservations about the project. Specifically, they argued that the project was unenforceable and that the possibility for high levels of weaving between the general purposes and reserved lanes created unacceptable safety hazards. It was not until the decision had been made by high level officials in the Department of Public Safety and the Executive Office of Transportation and Construction that there would be a project that the police agencies turned to developing a strategy of enforcing the project. This response reflects the general behavior of the police agencies throughout the project planning process -- decisions made by higher authorities will be implemented.

Because of the difficulties with geometric design, the Lane operated on a voluntary basis during the reconstruction of the Expressway. As was expected, the violation rates were quite high and although notifications of violation were sent through the mail, the non-compliance rate remained high throughout the summer. Safety issues once again were the dominant concern of the police agencies and they played an important role in identifying weaving sections that were particularly dangerous and that were to be the focus of increased enforcement efforts.

When transportation officials decided to continue the project beyond the end of the reconstruction period and had also decided that the only way to make the Lane successful was to enforce it, police officials once again voiced concerns about the enforceability of the Lane. They were particularly worried about the legality of sending citations through the mail and were not about to actively participate in the enforcement program until they had assurances that the courts would permit such a scheme. This attitude once again illustrates a key characteristic of police behavior in traffic enforcement -- the legality of the action and the capability and willingness of the courts to follow through on citations were important points to establish before the police agencies willingly participated in the program.

The enhanced enforcement strategy of the Reserved Lane was indeed successful in that the violation rate decreased significantly. However, the negative impact on the general use lanes was so dramatic and significant that the resulting controversy resulted in the termination of the project. This suggests two courses of action that could have been taken by transportation officials which might have changed the outcome of the project. First, the enhanced enforcement program, i.e., sending citations through the mail, could have begun at the beginning of the project when the Lane was more closely associated with the reconstruction.

To begin enforcement after five months of operation when drivers are now accustomed to the delays and congestion, while also taking away the original rationale for the project, had a high potential of raising the anger and frustration of the Expressway users. The second option for the authorities was to continue Lane operation as it had occurred during the reconstruction, i.e., low levels of enforcement, and accept the high level of violations. This option was not acceptable to the transportation officials who argued that the project would to all intents and purposes be worthless.

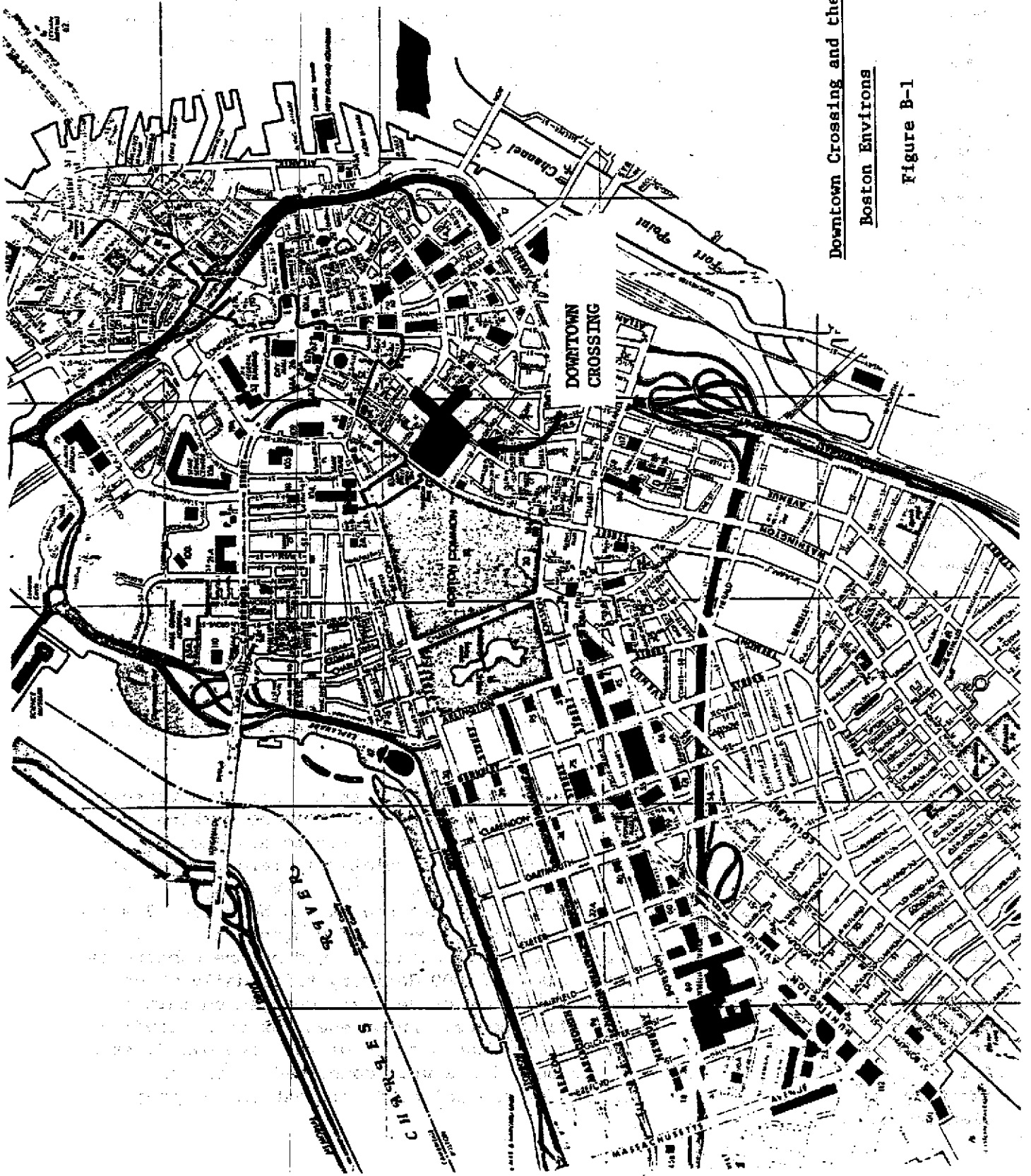
This case, and the other cases in this study, illustrate what seems to be the most effective enforcement strategy for innovative TSM projects -- enforce the project from the beginning of operation. This means that a great deal of effort must be made to assure the willing cooperation of the enforcement agencies and to alleviate their concerns about public safety, legality, and judicial follow-through.

CASE STUDY B: THE DOWNTOWN CROSSING

The Boston downtown retail district has been the focus of many improvement programs during the past 15 years. Numerous new office buildings, the construction of a Government center, and the recently completed and most successful Faneuil Hall complex all located in the downtown area have made the Boston central business district one of the most active and thriving in the U.S. In an effort to encourage the continued physical and economic revitalization of downtown Boston, city officials proposed and implemented an auto restricted zone (ARZ) centered on Washington Street, the center of the commercial district (see Figure B-1). The auto restricted zone, called the Downtown Crossing, was designed to take advantage of the high level of mass transit access provided by four subway lines and several express/local bus routes and the pedestrian activity that occurred in the area. As has been stated by several Boston officials, however, the successful enforcement of restricted vehicle access and parking was a key factor in the initial acceptance and eventual success of the Downtown Crossing. It is the purpose of this case study to examine in greater detail the dynamics of this enforcement component. [13]

The Enforcement Problem

The successful implementation of any innovative transportation project requires a great deal of attention at informing the general public of the new system or service and also requires special efforts to assure compliance with new rules and regulations, if such exist. One of the major components of the plans for auto restricted zones is a scheme for rerouting the traffic that originally traveled through the study area and a plan to direct those automobiles that were originally parked in the ARZ area to special parking locations at the periphery. The enforcement component of the strategy to implement an ARZ is thus to enforce all parking, traffic, and loading regulations in the study area and in the areas immediately adjacent to the ARZ. This enforcement is necessary not only to ensure the safety of the pedestrians now using the street areas, but also to maintain the flow of traffic now bypassing the central area. The first objective,



Downtown Crossing and the
Boston Environs
Figure B-1

ensuring the safety of the pedestrian, is even more critical in those ARZ plans that do not begin with massive redesign of the street system so that it does indeed look like a pedestrian zone, but rather convert the existing street to pedestrian use as the first stage in an incremental implementation strategy.

The Downtown Crossing provided an especially difficult enforcement problem. Although the original traffic volumes on the street that would constitute the ARZ were not large in comparison with those for other cities, the narrow streets and complex traffic circulation in the area produced high levels of congestion throughout the day. On Washington Street, for example, the evening peak-hour volume was close to 1,000 vehicles, a traffic volume that would now have to find alternative routing (assuming of course that the Downtown Crossing would not significantly affect modal choice for the work trip). Another factor that exacerbated the congestion problem was the high level of illegal parking that occurred throughout the area. For example, a traffic study completed in 1976 indicated that traffic flow in the downtown Boston could be increased by 35 to 40 percent if illegal parking were eliminated in that area. [14] A previous study in 1972 found that 27 percent of all cars parked in downtown Boston on an average day were parked illegally. [15] In specific regard to the Downtown Crossing, it was estimated that its implementation would eliminate approximately 600 on-street parking spaces, 240 legal and 360 illegal. [16] Thus, not only did there exist a general feeling among the public that illegal parking was acceptable, but the implementation of the Downtown Crossing would displace a large number of vehicles that would look for alternative locations to park and presumably, if given the chance, would still seek to park illegally in the Downtown Crossing area.

In addition to the large number of legally and illegally parked cars in the ARZ area, the downtown was the focal point for many urban goods deliveries. On an average day, almost 3,000 deliveries were made in the area including the Downtown Crossing and areas adjacent to it. Again, if the Downtown Crossing was to be a safe area for pedestrians, the access to the area of delivery vehicles had to be strictly controlled, and would require strong enforcement of loading and unloading restrictions.

In summary, the enforcement problems associated with the Downtown Crossing were formidable. The public had for many years felt that illegal parking was an acceptable risk to take because of the lack of follow-up to any tickets received. The Crossing was also going to displace a relatively large number of parkers whose initial reaction would most likely be to park illegally in the ARZ area. Although the volume of traffic that now had to be rerouted was not large, the narrow streets would create high levels of congestion which, if augmented by delays caused by illegally parked cars, could become unbearable. Finally, the downtown area attracted almost 3,000 delivery trips daily which would now have to be consolidated or the times of delivery changed so that the deliveries could be made during specified hours. Enforcement of these loading regulations would be especially critical to the success of the Downtown Crossing. All of these factors thus created the need for a well conceived enforcement strategy and a potentially vital role for the police department in the project planning process.

The Downtown Crossing--Round 1: The Early Stages

As stated earlier, transportation problems in Boston have long received a great deal of attention from city officials and professional planners. The governor's decision in the early 1970's to halt plans for major highway construction in the city created a cadre of transportation professionals concerned with many of the then non-traditional approaches to transportation system management. Thus, during the past decade one has seen in Boston efforts to increase parking restrictions, the imposition of a "freeze" on the provision of new commercial parking spaces, consideration given to discouraging commuter traffic through neighborhood areas, and greater emphasis on the important role that transportation investment can have on encouraging development in the downtown area. With this as a background, it is not surprising that serious efforts would be made to implement an auto restricted zone in downtown Boston.

The Downtown Crossing was not the first time that an auto restriction had been tried in Boston. In the 1950's, Winter Street had been closed on an experimental basis several times. In 1971, Washington Street was closed on Saturdays to allow car-free shopping. However, the Downtown Crossing was indeed the first attempt to create an auto restricted zone on a permanent basis. The idea for the Crossing came from officials in the Mayor's Office who felt that the Crossing made sense not only from a transportation planning point of view, but also illustrated in a visible way the Mayor's concern and interest in maintaining the Boston downtown area as the focal point of regional economic activity. In these early stages, three agencies were involved in the project development process--the Boston Redevelopment Authority (BRA), the Boston Traffic and Parking Commission, and the Mayor's office. However, it was not until the major proponents of the Crossing left the Mayor's office and became key officials in the Traffic and Parking Commission that the Downtown Crossing became a priority item on the transportation agenda for the City.

The perspective on the enforcement component of the Downtown Crossing plan differed significantly between the staffs of the different agencies involved. Staff members of the BRA felt that the project had to be designed for self-enforcement, i.e., the project should incorporate as many features as possible that make the Downtown Crossing look like an area where cars should not be. Suggestions for these features included mountable curbs, brick paving, and special lighting. Staff members of the Traffic and Parking Commission felt that given the public attitude toward enforcement, any effort to enforce the regulations in the Crossing area would be ineffective and that the best strategy would be to sign and signalize the area so as to discourage drivers from entering. The officials in the Mayor's Office, however, felt very strongly that unless a major effort were made to actively enforce the Crossing, it would be a failure. Their desire for an active enforcement program grew over time, especially when representatives of the downtown merchants stated that their support for the project was contingent upon the provision of police enforcement.

Thus, when planning for the Downtown Crossing became a priority activity after the officials in the Mayor's Office moved to the Traffic and Parking Commission, the question of what level of enforcement would be appropriate and feasible for the project became very important. However, the role of the

Police Department up to this time had been minimal. With enforcement now an issue, the Police Department had to be involved in the project planning process and at the request of the Traffic and Parking Commissioner, a representative of the Police Department participated in formulating the enforcement component of the project proposal. His major role, however, was in reviewing the proposed enforcement strategies and in identifying barriers to their successful implementation.

The proposal to the Urban Mass Transportation Administration (UMTA) requesting federal money to support the Downtown Crossing included a request of \$134,400 in Section 6 Demonstration Grant funds for the provision of enforcement. This figure included funds for four police officers (two from 8:00 am to 4:00 pm and two from 4:00 pm to 10:00 pm) and two additional tow truck operators, both groups for a period of 52 weeks. The enforcement costs were to cover "immediate police towing of illegally parked cars and the assignment of officers at the two major entry points into the TTIP [Downtown Crossing] area and at intersections which require traffic officers." [17]

Up to the submission of this grant application, the Police Department had not been actively involved in the project planning process. However, enforcement had been clearly identified as a major factor in the likely success of the Downtown Crossing, and as will be described in the following section, police officials were to play a critical role in successfully implementing the Downtown Crossing although this role was not so much a result of Police Department policy as it was of personal commitment to the project.

The Downtown Crossing -- Round 2: Implementation

With approval of the UMTA Demonstration Grant, more detailed plans could now be made on the specific implementation steps needed to successfully complete the project. An enforcement plan, so detailed as to discuss the exact position of police officers on the streets, was developed by a planner in the Traffic and Parking Commission and an official in the Mayor's office who was familiar with the then existing towing program. The Police Department representative reviewed this plan and identified the problems that would be faced in its implementation (such as the manpower assignments being incompatible with the existing structure of work shifts). As before, the role of the Police Department throughout this stage of the project was one of reviewing the plans made by others, rather than developing a plan of its own. However, individual police officers were soon beginning to influence the evolution of the plan as they became actively involved with specific plan components.

One of the most useful inputs from the Police Department came from a group of lieutenants being trained in the Boston Police Academy who were asked as an exercise in one of their classes to examine the enforcement plan of the Downtown Crossing and to recommend changes that would make the plan more effective. The enforcement resources in the original proposal were considered by this group to be too small by half. The lieutenants recommended a three-phase program. The intensive Phase I included five entry control officers, three of whom manned successive blocks of Washington Street leading to the restricted area. These officers were to effectively siphon off traffic before it could cause a disrupt-

tion at the entry point. Additional resources allocated in Phase I included five tow trucks and four meter maids. Phase II was to be a program that maintained continuous enforcement surveillance in the area, and Phase III would be an intensive program done randomly to freeze positive enforcement attitudes. [18]

The plan was thus to provide heavy enforcement during the first month, remove the pressure for two weeks, and then reapply it for two more weeks. The reasoning for this strategy was that the public had to be convinced early on in the project operation that City officials were serious about enforcing the restrictions. Enforcement could then be allowed to taper off, but reapplied at periodic intervals or when circumstances dictated. Another element of the plan included a concentration of enforcement efforts on the main street with allowances given to illegal parking on side streets. The lieutenants felt that this differentiation between important areas and less important areas helped create an image of enforcement in the Crossing area while not tying up traffic on peripheral streets with massive towing of vehicles. The maintenance of the traffic pattern was considered by the lieutenants a crucial objective of the enforcement plan.

Another key police actor in the development of the enforcement plan was the lieutenant in charge of the police towing enforcement unit. The lieutenant and an official in the Mayor's Office worked closely in devising a towing program for the Downtown Crossing that made available towing capability by switching the duties of existing tow operators from general scofflaw apprehension (tow and hold) to a concentrated effort on the Downtown Crossing. No additional towing resources were thus necessary, and there was also no added pressure placed on the adjudication process which was already reaching capacity.

The initial towing program consisted of motorcycle officers, meter maids, and police tow trucks supplemented with private contractor tow trucks. As it turned out, the meter maids did not participate in the enforcement program because union rules required that they be consulted in any decisions to reallocate their services. This had been overlooked by the enforcement planners, and accordingly the meter maids refused to participate. Although drivers of the buses using the Downtown Crossing were also requested to call the dispatcher to report any illegally parked cars, there are few examples of any bus driver doing so. The major reason for this seems to be that many of the bus drivers were unaware of their having such a capability.

Three days before the Downtown Crossing was implemented, leaflets informing the driver of what was about to happen were placed on the windshields of all automobiles in the study area. In anticipation of having to tow a much larger number of vehicles than under normal circumstances, the police towing unit focussed on three major streets prior to the initiation of the Crossing and raised its towing rate to 60 tows per day.

The Downtown Crossing opened on the Tuesday after Labor Day and the strict enforcement started that Thursday. The police lieutenant and the transportation official from the Mayor's Office directly supervised the towing program by riding around the study area and giving instructions and calling in tow trucks. Both felt that consistency was the most important attribute of the towing program

during the initial phase of the operation. Initially, 50 to 75 cars per day were towed, with the reaction time of the police tow trucks being very small -- as soon as a car parked in a tow area, a truck was called and the car removed. Close to 600 cars were towed the first week, and 400 the second week.

One of the major problems with the towing program was associated with the private contractor. The initial contract stipulated that the contractor would receive payment on a "per tow" basis which encouraged the truck drivers to quickly dispense of the car they were handling and return to the streets to get more. Several of these cars were damaged in these high-speed runs to the impoundment lot, resulting in claims against the City. In response, police officers in the Downtown Crossing called their own tow vehicles when the need arose. As a result of these problems, and also given an increased public understanding and acceptance of the Crossing, the tow rate decreased to about 10 tows per day when the contract expired in June, 1979. Currently, there is no special attention given to towing in the Crossing area which does not create that much of a problem of illegal parking because the Crossing has now been redesigned with the pedestrian totally in mind, i.e., it is obvious to the auto driver that he/she should not be in the area.

Case Summary and Interpretation

Although city officials had been considering the enforcement component of the Downtown Crossing for some time, the final traffic enforcement strategy was defined by the requirements of the plan submitted by the police lieutenants. Swift, sure, and firm enforcement had to be provided in order to change the habits of Boston motorists. Instant towing and plenty of traffic direction were the cornerstones of the learning process for the Boston driver. The initial intense effort was to taper off to a lower level after the new patterns had become established with periodic crackdowns occurring whenever violations became a problem, in order to "freeze" positive enforcement attitudes.

Another more passive enforcement strategy was to make the restricted area as self-enforcing as possible. This approach, led by the BRA, involved designing the restricted areas to look as though autos did not belong there so that police needs be kept to a minimum. Although not available in the beginning, the capital improvements such as bricking, lighting, and amenities that have been made during 1978 and 1979 define the regulated areas well and keep present day entry enforcement requirements to a minimum. Long-term ability for self-enforcement is a worthwhile goal, and combined with vigorous enforcement makes an effective campaign for the establishment of new driver behavior patterns.

Announcements about the Crossing and the changes to be made were distributed through the media. Radio stations were helpful in referring to the changes positively and not as potential disasters precipitated by downtown congestion. The support of the public and motorists at large was deemed crucial to the success of the plan, where success was defined as improvement of the downtown environment for shoppers and businesses. The public had to know what changes were being made and how they could cope with them.

In general, the large level of effort expended in considering all facets of the implementation process was well rewarded by the success the Crossing

now experiences. Even in this case where police officers did play an important role in the implementation of the project, some problems can still be identified. Even though the police department had some input in the planning through the lieutenants' critique of the plan, it was generally left out of the planning process itself. Some police officers felt as though the plan was handed to them as a fait accompli and were resentful of being excluded from the planning. They felt that in projects involving police participation a police representative should regularly attend meetings so that there is one officer who becomes familiar with the project. The meter maids' reaction is illustrative of what happens when key actors are not involved. Other agencies, in turn, are reluctant to include police officers in project planning for fear of police intransigence. This attitude between transportation planners and police officials is long standing and well known in the limited literature of traffic enforcement planning. This attitude, combined with an admitted lack of resources (and perhaps interest) in traffic enforcement on the part of the department, creates a complex and frustrating set of relationships between the images of various city agencies. In the case of the Downtown Crossing, where ties of cooperation and friendship existed, planning was well done and actions well executed. Where contacts were not so strong (meter maids, MBTA drivers), few successes were seen.

The conclusions that can be drawn from the Boston Downtown Crossing project are straightforward and well recognized by most of the actors involved. In light of previous experimental failures as a result of ineffective enforcement and management, enforcement for the Crossing was judged critical. Merchants insisted on it and the new traffic pattern would demand it, at least initially. The use of Federal funding to support enforcement was essential. Even though the enforcement effort was considered at least as important as any other feature of the plan, it comprised only 4 percent of the total expense of the project.

The coordination of planning and enforcement agencies was very important. Coordinated actions worked very effectively, but those without coordination were not successful. This coordination could be facilitated if some formal relationship were established to overcome the lack of regular established relations between agencies. Planning groups should seek out contacts in areas in which they have little or no expertise if they want to develop effective plans. The early involvement in the process of agencies critical for successful implementation is essential.

All persons questioned felt that the Downtown Crossing was successful and has improved downtown Boston. Enforcement and coordination were named as key issues in Boston and could be instrumental in other cities in a position similar to Boston's. While generalizing from the Boston experience might be dangerous, the favorable results in Boston do help support a stated need for police agency involvement in the planning process of innovative TSM actions such as the auto restricted zone in Boston.

CASE STUDY C: BOSTON AREA RESIDENT PERMIT PARKING PROGRAMS

The availability of parking for residential and commercial use has long

been considered a prerequisite for economic growth in urban areas. However, many times the supply of parking spaces is so limited that some form of allocation of space among different uses is needed. [19] The residential parking permit strategy constitutes a widely used means to restrict on-street parking availability to non-residents. These programs have been implemented in many communities, particularly in areas which experience heavy commuter parking. However, these programs vary with respect to the degree of restriction imposed upon the residents, and with respect to the objectives of the initiating community. [20] And as is shown in this case study, the effectiveness of these programs is directly related to the level of enforcement provided which is considered by many officials to be the program component most needing improvement to attain greater success in the future.

Residential Parking in the Boston Area

The first resident permit parking program (RPPP) in the Boston area, instituted as a portion of the Boston Transportation Control Plan (TCP), consisted of a two-hour limit and peak-hour parking ban on non-resident parking throughout Boston. The purpose of this program was to discourage automobile commuting into the city. Stickers were issued to city residents, exempting them from the two-hour limit and the peak-hour parking restrictions imposed in TCP.

Enforcement of the peak-hour non-resident restrictions was straight-forward as violations were easily recognized by the absence of a resident sticker. However, enforcement of the two-hour limit was problematical in that the identification of violations required multiple sightings of a non-residential vehicle in the same location at least two hours apart. Given limited resources, the police agencies were unable to enforce this two-hour limitation thus resulting in an ineffective program. This situation was compounded by the public's perception of non-existing traffic law enforcement, as discussed previously in the Downtown Crossing case study.

Cambridge, across the Charles River from Boston, instituted the first neighborhood RPPP in the Boston area in response to parking congestion created primarily by the city's proximity to Boston. Students attending Boston University on the Boston side of the river took advantage of parking space available across the river in Cambridge, thereby creating severe parking problems for the residents in the area. Similarly, commuters to downtown Boston took advantage of spaces near transit terminals in East Cambridge to park and ride to work, again creating parking problems for the residents and congesting local streets. RPPP's were instituted in these areas first, and were then modified and expanded throughout the city as the program developed.

Boston soon followed Cambridge in implementing neighborhood-based residential parking programs. Developed in response to neighborhood requests, the Boston neighborhood RPPP's are in force twenty-four hours a day, seven days a week, providing neighborhood residents with spaces reserved exclusively for them and no other city residents. These programs are instituted only when a significant number of residents (15% minimum) request them, and only after the neighborhood's boundaries are clearly defined. This latter requirement is needed for the program to be enforceable.

Cambridge RPPP

As a city close to Boston and a center for industrial and educational activity in its own right, Cambridge has suffered from parking problems for many years. As pollution and traffic problems increased, a solution for the problems was sought and the previously mentioned parking programs were the first efforts to deal with them.

The original resident permit received many complaints from residents and non-residents alike. After a short test period, the programs were suspended pending resolution of the problems that had been identified. Among the remedies were removing restrictions in commercial zones, issuing visitor permits to residents for their friends and family, and allowing commercial vehicles displaying signs clearly establishing their business, name, and telephone number to park in the area. Of these actions, the visitor pass system (as will be discussed later) presents the most problems for enforcement.

Once the programs were changed (and found constitutional by the courts), they were extended to all neighborhoods in the city. Principal attributes of the current program include:

A. Any Cambridge resident with a valid Massachusetts registration is allowed a city-wide resident parking sticker for the vehicle shown on the registration. To prevent abuses, the registration number is printed on the sticker. The original plan had a different sticker for each neighborhood in Cambridge, but the city-wide sticker was instituted after the program was instituted throughout the city.

B. Visitors receive visitor passes, two of which are issued to each resident, for use by friends and relatives of the resident. Residents not owning their own cars are also given visitor passes. Visitor passes, unlike the resident stickers, are only valid in one of the 13 designated neighborhoods in the city.

C. Resident parking areas are all city streets except for those areas directly in front of commercial establishments. Restrictions are in force twenty-four hours a day, Monday through Saturday. Exceptions are made on Sundays to allow easier visitations and church attendance.

D. All permits (resident and visitor) are re-issued January 1 of each year to provide control of the use of permits by former residents.

The Cambridge RPPP was designed by the Cambridge Traffic Department which consulted other concerned agencies as the need arose during the planning process. The Police Department participated in a series of meetings relating to the enforcement of the RPPP's, which at the beginning was the responsibility of the Police Department. However, the Traffic Department initiated the program and was the most forceful actor in the process; the police participation was limited to consultations.

Shortly after the RPPP was implemented, the city's parking control officers

were transferred from the Police Department to the Traffic Department, and Police Department involvement in the RPPP was limited only to program enforcement during the hours when the parking control officers were not patrolling. Presently, the Police Department considers its role in residential parking to be virtually non-existent.

Today, enforcement of the RPPP is handled by the city's parking control officers (PCO's) who work on two shifts, one during daytime hours and one in the evening to control violations when residents are returning home from work. RPPP enforcement is the major function of the PCO's although they also ticket meter violations in the business areas. PCO's walk through all areas of the city so that all streets receive at least one pass-by per week, the minimum coverage considered necessary for consistent enforcement. Violators are fined \$15, the maximum fine permitted.

The major enforcement problem is concerned with visitor pass abuses, of which there are two kinds. First, some residents allow friends to use their visitor passes regularly for commuting. No vehicle may use a visitor pass for more than three days, but spotting violations is difficult since regular sightings of suspected violators is necessary to show abuse. Second, some residents use the visitor passes on their own cars in order to avoid Massachusetts or local registration and its accompanying excise taxes and high insurance premiums. Residents who obtain visitor passes are required to sign a statement to the effect that they will not use the passes on cars owned or controlled by a Cambridge resident subject to a fine and revocation of all passes. Apprehension of such violations, however, is as difficult as with violators of the first type. Some of the visitor pass violations are spotted by the PCO's, through familiarity with the neighborhoods, while in other cases local citizens call complaints about violations spotted in their own neighborhoods, especially where parking is difficult. Even so, only about 400 of the 60-70,000 visitor passes issued were revoked for abuses last year. The problem is not seen as especially serious by city officials.

Counterfeit passes and permits are harder to discover than simple abuse, but counterfeiting carries heavy penalties since the city seal is included. The extent of counterfeiting is unknown, even though it is likely that it does exist.

Problems with enforcement that must be faced are 1) to refine the visitor passes to help prevent abuses, 2) that resident permits must be issued every year because of the transient nature of the Cambridge population, and 3) that PCO's are funded primarily with CETA monies and their future is uncertain. PCO's are the primary enforcers of the regulations, except for late-night enforcement undertaken by the Police Department. As it is, police manpower levels are below the desired number due to budget cut-backs, and their ability to adequately enforce city-wide RPPP regulations is constrained.

In the meantime, however, inter-agency liaison is good, especially as one department, Traffic and Parking, is responsible for nearly all operations concerning the RPPP. Even the rarely granted exceptions for hardships are handled by Traffic and Parking.

Despite the abuses, the RPPP is well supported in Cambridge and has successfully dealt with the problems it was designed to deal with. Quality enforcement is the cornerstone of the program.

Boston Neighborhood RPPP's

Because Boston is a much larger city than Cambridge, the implementation of RPPP's is much more difficult. Implementation of a city-wide program similar to Cambridge's would be a huge task, especially in the complex political environment of Boston. Resident-only parking is thus implemented on a neighborhood-by-neighborhood basis, and only at the request of the neighborhood involved. The Boston Traffic and Parking Department (T&P) is the coordinating agency for RPPP's in Boston, and requires a minimum of 15 percent of the residents of a neighborhood to sign the petition calling for RPPP.

Boston's RPPP experience began with the two-hour non-resident limit discussed above, but this program was not successful due to lack of enforcement. Neighborhood RPPP's were then planned for Beacon Hill and the North End, but were delayed while the Cambridge plan was tested in court. When Cambridge succeeded in its court test, Boston went ahead with its final planning. Principal attributes of a typical Boston RPPP are as follows:

A: A neighborhood must be clearly defined and easily identified and delineated, and strong local organizations must support the implementation and administration of the RPPP.

B. Neighborhood residents must show a registration with a neighborhood address on it. Leased cars must be principally garaged in the neighborhood. Registrations are cross checked by name and license number and are stamped by City Hall in order to prevent duplicate issuance. Illegally used stickers are easy to spot since 1) all cars with stickers must have Massachusetts plates, and 2) each sticker has the license number of the vehicle to which it was issued printed on it. Residents renting vehicles may receive a three-day pass upon presentation of the rental agreement and a driver's license showing a proper address.

C. Visitors are allowed to park in designated spaces only, usually near intersections, but must observe the non-resident two-hour limit if they are indeed city non-residents. Visitor spaces are used instead of passes in order to prevent abuses. Usually about one-quarter of the spaces are allowed for visitors, although residents may use visitor spaces also.

D. Commercial areas are metered to allow shoppers to park without permit.

E. Restrictions are in force twenty-four hours a day, seven days a week.

F. All permits are re-issued once a year in September (the major turnover period) following an extensive public information campaign.

G. To prevent abuses and counterfeiting, colors used are difficult to reproduce on copying machines, and the city seal is included on the sticker.

Boston areas now included in the RPPP's are Beacon Hill and Bay Village, with future expansions in the North End, Back Bay, and Brighton (see Figure C-1). The North End area has been fully planned, but local support has not materialized. Petitions have been circulated in the Back Bay and Brighton, but have not been returned as of this writing. The Brighton area is being considered because parking laws and enforcement in neighboring Brookline are much stricter and force parkers to cross over into Brighton.

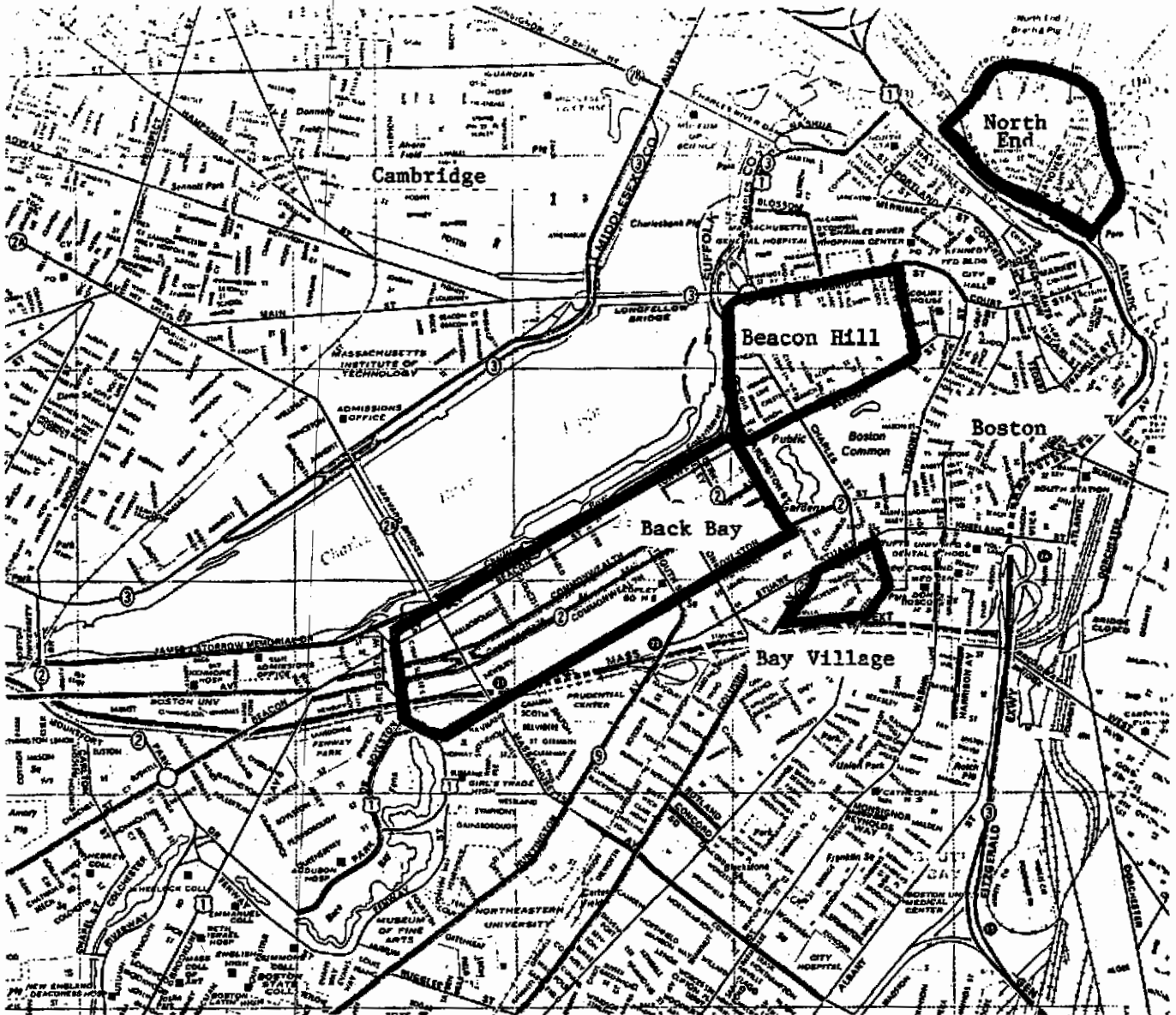
The Beacon Hill area was the first Boston RPPP area, resulting from its strong civic association, readily identifiable character, and longstanding parking difficulties. Out of 1000 spaces, about 750 are designated for residents only, but since there is a 6 or 7 to 1 ratio of permits issued to available spaces for residents only, a permit is not a guarantee of a space, just a license to hunt for one.

Enforcement on Beacon Hill is a key issue; about 300 tickets per day are given. Meter Maids working within the Traffic & Parking Department, are responsible for daytime enforcement, but their union rules prevent them from working evenings, a key enforcement period, so the Police Department is responsible for night-time and weekend enforcement. Meter Maid enforcement is generally very good, resulting from a plan gradually worked out by T&P over the last two years. The Meter Maids do a competent and thorough job. However, police enforcement is somewhat less effective because of the demands placed on the police as they are also responsible for the major downtown district. Residential parking enforcement is an understandably low priority and is the first thing to be sacrificed should the police be needed elsewhere in the busy district. Liaison and coordination between the agencies has been very good including meetings with the Police Department prior to the RPPP and an agreement by the Police Department to provide service for the RPPP, but the initial involvement of the police in planning was only limited to recommendations from the same group of lieutenants that advised planners on the Downtown Crossing. As in the Downtown Crossing, enforcement began at a heavy level, then tapered off as motorists became aware that the new program was in place and being enforced.

The Bay Village RPPP area was implemented several months after Beacon Hill. Though the area is not so easily identified by its own characteristics as Beacon Hill, it is no less definable and has a strong neighborhood association of its own. It is also much smaller than Beacon Hill (only about 600 people live in the area), but it is historically cohesive. There are 177 resident spaces for about 200 stickers, so there are usually spaces available for residents, in contrast to the shortage on Beacon Hill.

The Police Department's involvement in the organization of the Bay Village RPPP was minimal, consisting of approval of their role in the plan, inasmuch as the details of the plan were identical to Beacon Hill's.

Enforcement in the Bay Village is considered by the neighborhood association to be the area most needing improvement in the RPPP. The residents feel that Beacon Hill gets first priority on RPPP enforcement and furthermore that night-time enforcement suffers since the Bay Village area is near to the



Location Of Residential Permit Programs In Boston

Figure C-1

theater district and the city wants to "go easy" on theater-goers. Daytime enforcement is adequate since Meter Maids are used, but night-time pressures on the downtown district police lead to a lower night-time enforcement level. All in all, every group and agency recognizes that the critical consideration in a RPPP is enforcement, and that it represents the greatest area for improvement.

Because of good planning and a high level of community support, the Boston RPPP's have been successful, a great achievement considering the complex nature of parking in Boston. While weaknesses persist, the level of success is sufficient to encourage other Boston areas to consider RPPP's and to allow those in operation to continue.

Case Summary and Interpretation

The Boston area RPPP's have proved to be popular and successful innovative transportation projects, helping to reduce congestion and providing relief for residents in legal, equitable fashion. Community support for the projects has been shown to be essential for success, as shown by the quick negative response to the initial Cambridge plan. The Boston T&P Department's policy of insisting on wide community support is well founded and a cornerstone of the Boston RPPP policy.

Enforcement, according to citizen groups and city agencies, remains the most important aspect of any RPPP and also remains the area for the most improvement. The Boston plans appear to control abuses well, and Boston and Cambridge both exert tight administrative control on their programs, but enforcement remains the most troublesome aspect of the programs, especially considering the tenuous nature of funding for the Cambridge PCO's. RPPP enforcement exists also within the context of the generally very poor traffic law enforcement picture existing in the region. Improvement of public attitudes on enforcement in general could go a long way toward improving the picture for the RPPP's.

A solution proposed by one resident would utilize the resources of the neighborhoods by allowing sworn residents to ticket within their neighborhoods. For example, the Bay village area already has a citizen patrol in operation; extending their abilities to include ticketing for parking violations would reduce violations in the area at a low cost to the city. Such possibilities must be considered, especially if Meter Maid and PCO forces are cut in the future.

CASE STUDY D: "DENVER BOOTING" IN BOSTON

The original design of this research project did not include a case study of the use of the "Denver Boot" in parking enforcement in Boston. During the course of our field work, however, we discovered that the Tow and Hold operation of the Police Department was one of the more visible and effective enforcement programs in the city. For this reason, a case study of the tow and hold operation, and specifically the use of the "Denver Boot", was undertaken.

To try to correct the public's perception that parking tickets need not be paid, Boston began its Tow & Hold operation in the early 1970's. For many years, the city had impounded out-of-state cars with twelve or more unpaid tickets, based on a list of scofflaws compiled every two years. The Tow & Hold operation continued as a minor program until it was re-examined in 1976 during Boston's financial crisis. Officials in the Mayor's Office, looking for ways to increase revenues, identified Tow & Hold as a means for the city to obtain millions of dollars in unpaid parking fines. Upon the recommendation of the officials, the city discontinued towing of parking violations such as fire hydrants, bus stops, etc., left those tows to a private towing contractor working for the city, and put all of the city's towing equipment and manpower to work on Tow & Hold with a list of scofflaws that included all parking violators with five or more tickets.

In an effort to improve the effectiveness of the Tow & Hold campaign, the city began use of the "Denver Boot" in 1977. The "Boot" is a mechanical device which locks the axle of the automobile thus immobilizing it. The advantages of booting over towing were numerous: damage claims and thefts from impounded cars were eliminated, cars parked too closely for towing could be booted, traffic jams were not caused by booting, booting used less expensive equipment than towing, booting was faster than towing (five boots can be placed in the time it takes to tow one car), no impoundment lots were needed for booting (except for unclaimed cars), and perhaps most importantly, boots, visible on a scofflaw's car for hours while he pays the back tickets, demonstrated vividly to motorists the consequences of illegal parking and non-payment of tickets.

In fact, publicity was one of the most important aspects of the boot program. This publicity was put to good use in the initial stages of the booting program when the city had only a few "Boots" to use. Through massive publicity, however, the perception was made that the whole city would be enforced with the new device. Since the point is to increase revenue, the courts in Boston are reluctant to fine motorists for non-payment of tickets; changing motorists' perceptions so that tickets are paid before they are overdue is the most cost effective approach to increasing revenue. One city official estimated that the number of tickets paid up-front today is twice the number in 1976. Local media are eager to run stories on booting, adding to the new perception of illegal parking in Boston. There have been at least two stories per week in print about booting for the last two years.

Originally, only out-of-state cars were placed on the Tow & Hold list, out of a desire not to offend the residents of Boston. However, the political argument against booting Massachusetts cars failed when it was revealed that only 30 percent of violators were residents of Boston proper; therefore all violators with five or more unpaid tickets are placed on the Tow & Hold list today.

Planning

Planning for the "Boot" program was done by the Mayor's Fiscal Affairs Office (MFAO) as part of an overall ticketing improvement program with the cooperation of the Traffic & Parking Department and the Police Department.

The planning was not easy and some city officials disputed many of the details of the program. Police participation consisted of the involvement of a high police official in the process, and most participants agreed that the police were cooperative although mostly reacted to proposals.

The MFAO decided that adjudication would be left to the courts at least initially in order to facilitate adoption of the plan. The courts, inherently resistant to change, went along with the plan after prodding from the MFAO. Cooperation from the Registry of Motor Vehicles was necessary but slow in coming. In all, fourteen departments in three layers of government (city, county, state) were involved with the Tow & Hold program.

Procedure and Problems

Meter Maids from Traffic & Parking and police officers issue violations. After twenty-one days, unpaid tickets are turned over to the courts for collection. The courts, after warnings and summonses have been ignored, turn the lists of violators with five or more tickets over to the city for Tow & Hold immobilization. Scofflaws must pay all outstanding tickets before their cars are released. However, this apparently simple process for parking enforcement can be full of difficulties at every step. In the past two departments have been unable to agree on which is responsible for purchasing the tickets, therefore violations go untagged. The courts have become lax in their mailing of summonses, and in late 1979 one court had not even mailed out summonses for 1978 violations. Cooperation from the Registry in providing names and addresses of violators was not reliable but has been improving. Data processing and list publication has often been delayed. All of these delays result in many scofflaws never being located because of changes of address or changes in vehicle ownership. And of course, finding the listed vehicles is no easy task in a city the size of Boston.

Originally, spotters and booters travelled together in pairs, but it was discovered that there was greater efficiency in separating the two functions. Spotters, civilians funded by CETA, travel by foot and call for a booter once they have called in and checked to make sure a car has not been recently removed from the Tow & Hold list. When the scofflaw finds his vehicle booted, a notice on the windshield tells him which court districts he must visit to pay his fines. There may be several districts to be visited, taking up to a day in total for resolution. Receipts from all involved courts must be presented at the police tow lot for the vehicle to be released.

Excise Tax Collection

The Commonwealth of Massachusetts imposes excise taxes on all motor vehicles registered in the Commonwealth. Often, the same people who have not paid back parking tickets have not paid excise taxes. In 1979, by arrangement with the Registry of Motor Vehicles, cars that are booted for back tickets are also checked for back excise taxes. If any taxes are owed, they must be paid before the vehicle is released. Presently about 15 percent of the vehicles booted owe back excise taxes, and officials expect a significant amount of tax revenue to be collected.

Results

On the average, 100 cars per day are booted with the average scofflaw owing \$150 - \$160. In the initial stages of the program, the average owed was \$300, yielding about \$2 million for the city that year. The level of revenue intake could be increased, but is limited by the number of boots the city owns, presently about 200. As is illustrated in Table D.1, the revenue collected by the courts is directly related to the level of enforcement. No detailed evaluation of the program has been done yet, but city officials feel the program is a great success. One readily observable result is that parking lots in Boston appear to be more full since the introduction of booting as motorists have come to learn that illegal parking is not free parking anymore. The impact of booting has thus reached far beyond the scofflaws who owe back tickets.

Interdepartmental Relationships Today

Now that the program is in place and apparently successful, working relationships among the multitude of departments involved have been established. Registry cooperation is now regular. The Commander of the Police Towing Enforcement Unit warns the court district involved before he moves into an area so that the court will be prepared for the influx of scofflaws following an area booting. Ticket purchasing problems and Tow & Hold list publication problems, however, still surface.

Future Developments

Since 1976, a bill has been submitted to the City Council every year calling for the creation of a Parking Violations Bureau (PVB), but it has not been passed. The PVB would take over most of the responsibilities involved in parking violations including adjudication, which would be an administrative function, similar to that in Washington, D.C., or New York City. Streamlining by use of the PVB could increase efficiency and cut costs and delays compared to the present fragmented system. The reasons for the bill not passing are many, and can be best summarized by saying that it is a part of the bargaining process that occurs during Council debate. Eventually, the bill is expected to pass.

The fine structure in Boston has remained constant for many years. Fines are generally low, with penalties for non-payment of tickets also low and usually not imposed. Bills to increase fines and penalties have been submitted to the legislature but have not passed, with the exception of an increase in the fine for parking in a "handicapped only" space. An increase in fines would tend to reduce illegal parking and increase revenues from those who still refuse to pay fines on time. As with the PVB bill, the new proposed fine schedules will be resubmitted and promoted until they pass.

As one step in moving toward a centralized operation, booting operations will be moved in the summer of 1980 from the Police Department to the Traffic & Parking Department. This move will help streamline operations somewhat, but adjudication will remain in the courts until the PVB bill passes.

TABLE D.1

RELATION OF TOW AND HOLD ACTIVITY

TO TICKET REVENUES AT BOSTON MUNICIPAL COURT (BMC)

<u>Year</u>	<u>Tow and Hold</u>	<u>Percent Change from Previous Year</u>	<u>BMC Ticket Collections</u>	<u>Percent Change from Previous Year</u>
1974	3,781	--	--	--
1975	3,943	+ 4.3%	\$2,026,457	--
1976	2,903	- 26.4%	\$1,818,493	- 10.3%
1977	8,708	+200.8%	\$2,478,234	+ 36.3%
1978	8,312	- 4.5%	\$2,405,684	- 2.9%
1979	12,464	+ 50.0%	\$3,368,304	- 40.0%

Case Summary and Interpretation

Use of the Denver Boot in Boston has produced positive results in that revenues are increased and the public's perceptions about illegal parking have been changed. The success is commendable especially in light of the multitude of agencies and departments involved in the process. Improvements have been planned but await legislative approval for implementation. Involvement of the police has been successful, although their role will be minimized when booting goes over to the Traffic & Parking Department this year. The program, one of the first full-time booting operations in the country, can be termed a great success and will continue in the future as an effective method for enforcement of parking regulations.

PARKING ENFORCEMENT

The last two case studies discussed above highlighted a type of project where success depends greatly on the use of enforcement strategies, i.e., enforcement of parking management strategies. Transportation planners and engineers have often recognized that enforcement was a critical component of project implementation, especially as it related to the success of parking strategies. As found in the following statements, effective enforcement of parking regulations has been found to serve several purposes while also encountering many problems.

"The practical difficulties of initiating and operating a restraint scheme must be addressed. Administration and enforcement of present day parking controls has proved to be costly and difficult." [21]

"Strict enforcement, particularly in well-traveled areas, is generally required in order to achieve maximum benefit from parking controls...Thus full enforcement of existing parking restrictions might preclude further restriction or removal of on-street parking." [22]

"Parking regulation and enforcement is a problem of major proportions in New York City...A voluntary system or random enforcement of a rigid system provides little control and builds citizen antagonism." [23]

"To fully serve their purpose, parking regulations should be strictly enforced...When parking is completely prohibited for any period, it is essential that the restriction be enforced to provide for additional roadway capacity." [24]

"Although on-street parking and loading is heavily restricted in the study area, the lack of enforcement permits private vehicles to encroach on designated loading zones." [25]

However, enforcement strategies have only recently been considered as an important element of transportation system management (TSM) plans and also considered critical enough to warrant investigation as to its role in TSM planning. [26] In Louisville, for example, parking enforcement is considered

as a means of improving traffic flow along specific roadways, whereas in Arlington, Virginia, and in Palo Alto and San Francisco, California, an enforcement program is a key element of that city's resident permit parking program. [27, 28] Washington, D.C.'s parking enforcement program, one of the most extensive and all encompassing in the nation, grew out of the District's problems with high numbers of illegally parked autos. The D.C. Department of Transportation conducts aggressive ticketing, towing, and booting campaigns using both civilians and police personnel. In addition, Washington has RPPP areas which pay for themselves in collected revenues. Washington also uses an administrative adjudication process, saving money over the criminal court system used formerly. [29]

Although several cities have implemented enforcement programs (either associated with specific projects like RPPP's or a more general program like that in Washington, D.C.) there is very little information on how effective these programs have been. In most cases, this is a problem because it is very difficult to distinguish between the enforcement of a strategy and the effect of the strategy itself. Thus, in the case of RPPP's, a sample study of two neighborhoods in Cambridge, Massachusetts, showed that one year after RPPP implementation, there was a 31 percent decrease in the number of cars parked on the street. In Washington, D.C., the decrease in non-resident vehicles parking in two residential areas was 62 percent and 42 percent, respectively. [30] Clearly, the existence of enforcement influenced these results, but it is impossible to isolate the specific contribution made by the enforcement component. The parking enforcement program in Washington, D.C. is, however, one of the few programs where information has been kept on the effect of enforcement on parking behavior. As shown in Figure 2, enforcement had a major impact on parking turnover and percent of illegally parked vehicles in the CBD. Although there is little information available on the impacts of parking enforcement on driver behavior from other parts of the country, the results shown in Figure 2 seem to indicate that with aggressive enforcement, the impact can be significant.

One impact category where more data is available is the amount of revenues that is generated by the enforcement program. Washington, D.C. is producing an impressive level of net revenues from its enforcement program. The D.C. Parking Control Aides (PCA's), on a budget of \$1.03 million, netted \$5.37 million in fiscal year 1979. The towing program netted \$4.2 million and booting \$3.5 million, for a total program net of over \$13 million. In Portland, Oregon, \$400,000 is budgeted for PCA's and \$1 million in revenues are collected yielding \$600,000 net which provides the budget for the Portland Bureau of Traffic Engineering. In Cambridge, Massachusetts, 16 PCA's were hired at a cost of \$63,000 to enforce the city's resident parking program which produced \$242,000 in revenues. Enforcement programs thus not only serve as effective means of achieving transportation and environmental objectives, but they also produce revenue for the implementing municipalities. However, as was shown in the discussion of parking enforcement in Boston, these programs oftentimes are not that simple to implement and continue in operation.

This Boston situation underscored a very important characteristic of parking enforcement programs; that is, their success depends on the willingness of all actors in the process to participate fully in identifying and processing parking violators. Because this process is usually long and involves several agencies, the effectiveness of the overall program is somewhat "fragile" in that

	PRIOR TO ENFORCEMENT PROGRAM	AFTER ENFORCEMENT PROGRAM
- Legal Hours Parked	13%	56%
- Illegal Hours Parked	84%	31%
- Vacant Hours	3%	13%
- Turnover	1.2	2.9

Source: John F. DiRenzo, et al., Study of Parking Management Tactics, Volume III: Reference Guide, draft, FHWA, April 1980.

WASHINGTON, D.C., TURNOVER STUDY COMPARISONS

Figure 2

one participant, e.g., the courts, by not issuing summonses, could delay the whole process. The potential solution to this problem is to involve all of the major actors in the initial planning of the program and to secure their commitment for program implementation. A more serious approach would be to create the organizations and procedures, e.g., administrative adjudication, needed for successful operation, but such an approach often encounters many legal, institutional, and political obstacles that serve to delay program implementation. Individuals seeking to create or enhance a parking enforcement program must not only examine closely the types of enforcement tactics that will be used, but also determine the capability of the major participants to handle their responsibilities in the process.

Well-designed and well-supported enforcement can also pay for itself and even turn a profit for cities using it. Parking enforcement in Portland, Oregon, provides the budget for the Portland Bureau of Traffic Engineering. The District of Columbia, with a comprehensive program of enforcement, including ticketing, towing, booting, and administrative adjudication, nets \$13 million a year for the district. Use of the Denver boot in Boston, Massachusetts, provides a significant source of revenue for the City of Boston, well into the millions of dollars per year. Additionally, booting in Boston has begun to change positively the public's attitudes toward the acceptability of illegal parking and non-payment of fines.

If the enforcement of parking management strategies is so critical to their success, and if such enforcement can usually pay for itself (if not provide additional revenues), then why are more enforcement programs not found throughout the country? The answer to this question is found in the institutional complexity of the enforcement and adjudication process and the often critical hurdle of start-up costs.

The implementation of a parking enforcement program or the enforcing of a newly implemented parking management strategy often requires the cooperation of several city agencies -- police departments, traffic engineering departments, city courts, city planning departments, the mayor's office, and city council. Outside of the city jurisdiction, one finds county courts, local and community interest groups, State Departments of Transportation and Motor Vehicle Registration, and in some cases, the State legislature. The more ambitious the scheme, the more actors that are usually involved. When increased parking fines are being considered, elected city officials become actively involved. When a new organization is being created to handle enforcement adjudication, e.g., the Parking Violations Bureau in Boston, legislators, judges, and transportation planners/engineers all become involved. And the key characteristic of most organizations involved with enforcement, i.e., the police and the courts, is that parking enforcement is not their primary concern.

Partly because of this last characteristic, the most effective enforcement programs seem to be those where parking control aides or meter maids are used for ticketing purposes. They are less expensive and more efficient than regular police for parking enforcement. Regular police usually have other more important duties and must be better trained and better paid than non-police officers. Experience also shows that parking control aides can pay for themselves with the additional revenue generated. Of course, the court system must still be able to handle the additional tickets that will be generated by these programs.

Although the institutional complexity of implementing an enforcement program is formidable, the most serious obstacle is oftentimes finding the initial funding. The start-up costs for the Washington, D.C., enforcement program, for example, were \$766,000. [31] Even though enforcement is a critical component of parking project implementation, the U.S. Department of Transportation does not recognize the cost of providing enforcement as allowable expenses under the Federal-Aid Highway Program, partly because of its interpretation of U.S. Code, Title 23, which states that federal-aid funds should be used for "construction" purposes. Recently, however, steps have been taken to use federal monies for "initial" enforcement and personnel costs associated with implementing high occupancy vehicle lanes. [32] Hopefully, the U.S. Department of Transportation will adopt a similar policy with respect to enforcement costs in implementing parking management strategies, or seek legislative changes that will allow such costs under existing federal funding programs.

CONCLUSIONS

The Boston case studies have focussed on the dynamics of the project planning process at the local level, with special emphasis given to the role of enforcement agencies in that process. Hence, the conclusions discussed below relate specifically to local level actions. Future work will examine what role federal agencies can adopt to encourage a stronger linkage between planning and enforcement, a critical component of implementation.

The four projects examined in this case study clearly established the importance of enforcement actions in the project implementation process. In all four cases, the enforcement program, or the lack thereof, was pointed to by those interviewed as the most critical aspect of the project. In addition to the need for enforcement, this case study has also shown that the enforcement of a project should begin when the project is first opened so that any required change in attitudes or travel behavior is reinforced.

The conclusions from this case study can be grouped into three areas: characteristics of the enforcement agencies and attitudes of their officials toward transportation projects which encourage or hinder effective participation in the project planning process; the process which was used in Boston to incorporate enforcement officials in the planning of the four projects; and the type of enforcement strategy that was used, and could be used, to assure compliance with the project's requirements.

CHARACTERISTICS OF ENFORCEMENT AGENCIES AND ATTITUDES OF POLICE OFFICIALS

1. Police agencies are paramilitary organizations with a strong authority control structure. Police officers are willing to participate in the project planning process but if the project in question is controversial or if the project is so large as to require a major commitment from the police agency, higher authority in the police department must approve any action involving the police.

2. The primary concern of the police agencies is public safety. In the case of the preferential lane on the Boston expressway, the police representatives constantly voiced concern about the safety hazards created by the design of the Lane. These design characteristics also led these representatives to argue that the Lane was unenforceable, resulting in a voluntary compliance program during the initial phase of the project.

3. The Boston Police Department (and many police departments in other cities) no longer has a special division for traffic. This means that traffic enforcement and any other transportation-related actions must compete with other, higher priority responsibilities of the police agency. This implies that police enforcement in such cases will not be available on a consistent basis, and that alternative means of enforcement (such as meter maids) should be considered.

4. Police officials are very concerned about the legality of enforcement actions and the capability of the court system to handle an increased level of violations. Judicial support for the project, and specifically the enforcement component, is essential to assure police cooperation.

5. Police agencies tend to be reactive agencies, i.e., they respond to crises and actions that occur in their area of responsibility. This characteristic was also evident in the participation of police officers in the project planning process, i.e., officers would respond to proposals made by others rather than taking full responsibility for developing the enforcement plan. It should be noted, however, that in most cases police officials were not invited into the process until it was well underway, even when the police were involved in discussions of the problem in the past.

6. We have found that the enforcement agencies in the Boston region tend to be institutionally isolated from those agencies responsible for transportation planning. Police officials are not members of, and do not attend, meetings of the formal transportation groups in the city. In the case of the Boston Police Department, the Police Commissioner is a member of a Commission on Public Improvements where he is informed of transportation actions that are to be implemented in the city and any special circumstances relating to police involvement. Other than this situation, police involvement in transportation planning is on a project-by-project basis.

PROJECT PLANNING PROCESS AND POLICE INVOLVEMENT

1. An earlier research report concluded that transportation planners do not consult enforcement officials during the project planning process. The focus of this case study has been on the implementing agencies and we have found that this observation is not true in this case. Enforcement agencies were involved in the process of developing an implementation strategy, although by this time much of the project design has already been finalized.

2. As noted above, police officials participated in the project implementation process and in some stages of the planning process, although their participation in the latter was not sought until late in the process. The contributions of

the police representatives in designing the enforcement strategy were large, although many times their contribution was changing components of a strategy already formulated by planners.

3. Several police officials stated that they would like to see their agency involved earlier in the process so that they could play a more important role in project design.

DEVELOPMENT OF AN ENFORCEMENT STRATEGY

1. Enforcement was considered the most important component of all the projects examined in this case study.

2. Heavy enforcement must occur in the early stages of a project so as to reinforce the need for changes in attitudes or behavior. The enforcement can then taper off with periods of increased enforcement occurring later. This type of strategy was apparent in all of the projects examined in this case. In the auto-restricted zone project, it was the police representative which suggested such a strategy to replace a proposal from the planning agency to have uniform enforcement throughout the year. The preferential lane project illustrates what happens when such enforcement is not present, and is later instituted to ensure compliance. After five months of operation with voluntary compliance and extremely high violation rates, transportation officials decided to enforce the project. Because of this action and other important reasons (see Case Study A), the project became extremely controversial and was terminated.

The important lesson to learn from these projects is that every effort should be made to overcome the technical and institutional barriers to effective enforcement so that such action can be instituted during the initial stages of the project.

3. Where possible, the design of the project should provide for self-enforcement. In the auto-restricted zone project, for example, efforts have been made to design the zone so that there is little question that autos do not belong in the area.

4. A very important aspect of an enforcement strategy is the structure of fines which serves as a deterrent in itself if it is sufficiently onerous. Many officials pointed to the parking fine structure and its relatively small fines as a good example of not trying to discourage violations at their source. The use of the "Denver Boot" and the resultant heavy penalties have been shown to have a positive effect on payment of past parking fines and on illegal parking.

In general, this case study has shown the importance of enforcement in assuring the success of transportation projects. We are also now in a position to answer the questions posed at the beginning of this study.

- What are some of the institutional constraints that limit the participation of enforcement agencies in the transportation planning process?

Enforcement agencies tend to be isolated from the other agencies in a metropolitan area involved with transportation efforts. They have not traditionally held close liaison with planning and implementing agencies, and indeed have often focussed resources on other issues perceived more important than traffic law enforcement, e.g., serious crime apprehension and prevention. Further, enforcement agencies tend to be closely tied with the judicial system and do not undertake actions which will not be supported by the courts. Finally, the lack of financing of police participation in transportation planning and project implementation creates serious obstacles to effective implementation.

On the other side, transportation planners often ignore the potentially critical role that police officers have in the design of TSM projects. Police representatives are often incorporated into the project planning process, but usually late in the process and without full recognition of the contribution that such representatives could make.

- . How do police representatives view their involvement (or lack thereof) in the planning process?

The Boston case studies represent a very small sample on which general conclusions can be made. Indeed, in these cases, police officers expressed two viewpoints on this particular issue. One group suggested that the current situation of law involvement was most appropriate given the other more important demands on the police force. However, another group, perhaps importantly represented by those most actively involved in the Boston projects, felt that a more active involvement was necessary. This group could not understand why the police department was added to the planning process as a minor actor when police participation during project implementation was absolutely critical to project success. In general, most police officers felt a strong police representation somewhere in the project development process was necessary.

- . What information or technical capabilities do enforcement agencies have that could complement existing planning approaches?

Police officers are probably the most qualified individuals to comment on driver response to changing circumstances. They work on a day-to-day basis with this type of behavior. Thus, police representatives would be able to provide insightful comments on the feasibility of project concept and design, while also establishing the basic characteristics of an enforcement strategy that would effectively reinforce desired project results.

These conclusions were borne out most visibly in the Downtown Crossing project where police representatives changed the enforcement plan prepared by transportation planners and devoted a lot of resources during the initial stages of project implementation. Without this input, the project might not have been quite so successful.

- . How can transportation agencies at all levels of government contribute to an increased role for the police?

There are three major actions that government agencies should adopt to accomplish this increased role. At the local level, transportation agencies should recognize the importance of police participation in project and plan

development and provide formal opportunities for their participation. These opportunities should be supplemented with financial support where necessary to allow such participation.

At the federal level, the U.S. DOT should, 1) provide for the funding of enforcement activities in the existing funding programs (and strive for legislative changes where necessary), and 2) disseminate information to transportation planners and police officers as to the important role of enforcement in project implementation. Oftentimes both groups do not understand the processes, procedures, and motivation of the other.

- . How do the characteristics of an enforcement strategy relate to project implementation?

In both Boston project cases (and in others examined in this research project), the implementation of the project depended heavily on enforcement. The lessons from these projects indicate that heavy enforcement of the project should be provided in the initial stages of implementation with a gradual tapering off, if necessary. And, as illustrated by the Reserved Lane, enforcement should be provided at the beginning of the project so that desired travel behavior is encouraged from the beginning. The project implementation process is as critical (if not more so) in the design of a project as the planning process, thus great care should be made in providing for early and effective police involvement.

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