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**Urban Mass
Transportation
Administration**

Evaluation of the Washington, DC, Parking Enforcement Program

**Final Report
September 1982**

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Service and Management Demonstrations Program

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16. Abstract

This report documents the evaluation of the Washington, DC, parking enforcement program. This comprehensive program is operated by the District of Columbia, Department of Transportation (DC DOT). The program has resulted in the successful integration of civilian ticket writers, vehicle immobilization (with boots) and administrative adjudication into a coordinated parking enforcement program.

The report describes the evolution and daily operations of the program. The productivity and cost effectiveness of the enforcement program are analyzed. The program impacts on travel behavior and demand are documented. The reactions of selected interest groups to the program and its financial implications are described. The final section of the report assesses the implications of this program for other urban areas.

The positive results of the parking enforcement program in the District of Columbia and similar successes in selected other communities establish a clear rationale for the implementation of an on-street parking management and enforcement program. The transportation and financial benefits of such a program are clear, particularly in terms of decreased parking violations, increased on-street parking space availability, and major increases in net revenues to the city. A parking management program further provides significant other benefits, such as improved transit operations and productivity, improved quality of life in neighborhoods, improved safety, and improved air quality.

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PREFACE

Many cities throughout the country are confronted with the challenge of developing an integrated, coordinated on-street parking management program which can accommodate high levels of automobile use within the constraints of safety standards and limited municipal budgets. Effective parking management, a goal in itself, has the added dimension of providing a significant non-tax source of revenue to cities in financial crisis.

The Washington, D.C. Parking Enforcement Program (PEP) is probably the most comprehensive parking enforcement effort recently implemented in the United States. Operated by the District of Columbia Department of Transportation (D.C. DOT), this program incorporates ticket writing, booting, towing, and administrative adjudication. Washington's PEP was implemented primarily with local funds, although a grant from the National Highway Traffic Safety Administration was utilized to fund a portion of the early PEP planning.

This report describes the history, operations, productivity, and costs of the Washington PEP. It then assesses the impacts of the PEP on parking behavior and supply and presents a comprehensive financial analysis of the program. Finally the report examines the implications of the Washington, D.C. PEP for other cities.

This report has been prepared for the Transportation Systems Center (TSC) by a Peat, Marwick, Mitchell & Co. project team which included Raymond Ellis, Bart Cima, and Lannetta Hildebrand. The authors would like to thank John Brophy and Fred Caponiti, former and current directors of the Bureau of Parking and Enforcement of the D.C. DOT, for the assistance and counsel which they provided throughout the course of this study. They and their staff at the Bureau of Parking and Enforcement provided extensive data to the project team and carefully reviewed the materials developed during this project.

The authors would also like to thank Carla Heaton of TSC and Bert Arrillaga of UMTA for the advice and support which they provided to this evaluation project. Their constructive ideas contributed greatly to the conduct of this evaluation. While sincerely appreciative of the contributions of each of the above individuals, the authors acknowledge their own responsibility for the content and conclusions of this report.

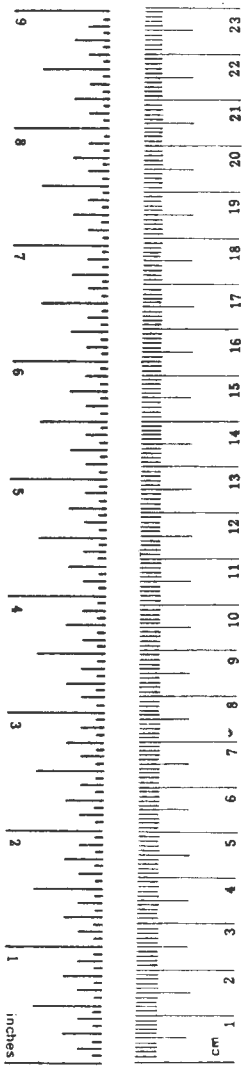
The authors extend special thanks to Joanne Coffin, who edited and managed report production, and to the Peat Marwick graphics and word-processing departments.

METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

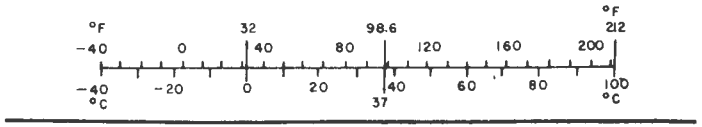
Symbol	When You Know	Multiply by	To Find	Symbol
	LENGTH			
in	inches	*2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
	AREA			
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
	MASS (weight)			
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
	VOLUME			
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
	TEMPERATURE (exact)			
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

*1 in = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price $2.25, SD Catalog No. C13.10:286.



Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
	LENGTH			
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
	AREA			
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares (10,000 m^2)	2.5	acres	
	MASS (weight)			
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
	VOLUME			
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m^3	cubic meters	35	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
	TEMPERATURE (exact)			
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



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SYMBOLS AND ABBREVIATIONS

AAA	American Automobile Association
BPE	Bureau of Parking and Enforcement
BTA	Bureau of Traffic Adjudication
CBD	Central Business District
D.C. DOT	District of Columbia Department of Transportation
FMS	Financial Management System
FY	Fiscal Year
GOA	Gone On Arrival
MPD	Metropolitan Police Department
MWCOG	Metropolitan Washington Council of Governments
PCA	Parking Control Aide
PEP	Parking Enforcement Program
RPPP	Residential Parking Permit Program
SMD	Service and Methods Demonstrations
SOD	Special Operations Division
TSC	Transportation Systems Center
TSM	Transportation System Management
WMATA	Washington Metropolitan Area Transit Authority

EXECUTIVE SUMMARY

PARKING ENFORCEMENT

Parking management tactics have become the focus of renewed attention as potential tools to help achieve transportation system management (TSM) objectives. A parking management tactic is any action taken to alter the supply, operation, and/or parking demand of a jurisdiction's parking system in order to attain local objectives, e.g., improve quality, energy conservation, reduce travel times.

During a recent study of parking management tactics,* it became apparent that a comprehensive parking enforcement program (PEP) should be a critical element of an overall parking management program. Many communities around the nation have used enforcement tactics, such as aggressive ticketing, towing, and booting illegally parked vehicles. Though these tactics are not new, they have received little attention as a means of reaching broader transportation, economic, environmental, and related objectives.

Along with increased enforcement efforts, several communities have investigated the idea of transferring adjudication responsibilities from city criminal courts to their traffic departments. The advantage of this transfer, much like the use of civilian parking control aides, is that the traffic department will place a higher priority on parking enforcement and that records can be centralized in one agency. Another advantage of this concept is that it allows the traffic department to administer penalties that are consistent with its ticketing policies. In some communities, traffic departments have been frustrated in their parking enforcement efforts by courts that fail to impose serious fines on blatant scofflaws and parking violators.

PURPOSE OF STUDY

The Washington, D.C., PEP is probably the most comprehensive parking enforcement effort recently implemented in the United States. Operated by the District of Columbia Department of Transportation (D.C. DOT), this program includes ticket writing, booting,

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* John F. DiRenzo, Bart Cima, and Edward Barber, Study of Parking Management Tactics, prepared for Federal Highway Administration, prepared by Peat, Marwick, Mitchell & Co., December 1979.

towing, and administrative adjudication. This locally implemented enforcement program is unique in several aspects. It is one of the few programs which actively links parking enforcement with overall TSM. The program has brought enforcement and adjudication into one organization.

The Service and Methods Demonstration (SMD) Program has the objective of improving existing transit operations by sponsoring the development, implementation, and evaluation of new techniques and services on a nationwide basis. Increased on-street parking enforcement offers the promise of improving transit operations. The active ticketing and towing of peak-period parking violations helps ensure the availability of the curb-lane for transit vehicles. This could improve travel times and reliability. Midday enforcement helps reduce double parking and keeps bus stops clear of illegally parked vehicles. Additional enforcement also increases the chances of a motorist's being fined for illegal parking. This monetary disincentive could induce some motorists to switch to transit. Further, parking enforcement is an important element of TSM which has not been fully utilized in recent years.

Thus, the D.C. DOT parking enforcement program has offered a unique learning opportunity. SMD has sponsored this evaluation to provide current information on an innovative PEP. The results presented here should enable cities throughout the United States to learn from the Washington experience as they implement their own enforcement programs.

OVERVIEW OF THE PEP

In order to centralize responsibility for parking throughout the District, the Bureau of Parking and Enforcement and the Bureau of Traffic Adjudication were formed within D.C. DOT. The role of the Bureau of Parking and Enforcement is to effectively manage the District's parking system to achieve transportation, energy, and environmental goals and to generate revenue for the District's General Fund. The Bureau performs parking studies, manages the parking meter operation, and enforces parking regulations. There are no municipally owned or operated off-street parking garages or lots in Washington, D.C. The Parking

Enforcement Division of the Bureau contains the sections which write the tickets, impound vehicles by towing, and immobilize vehicles by using Denver boots. Through this integrated approach, all activities connected with parking are brought together in one bureau. This ensures coordinated operations and policies.

The remainder of this section discusses the operations of the ticket writing, towing, and vehicle immobilization (booting) branches of the Parking Enforcement Division and the Bureau of Traffic Adjudication.

Ticket Writing Branch

The backbone of the Washington, D.C., PEP is the ticket writing branch. The enforcement of parking and other non-moving violations has been the responsibility of this branch since October 23, 1978. Fifty civilian parking control aides (PCAs) are used to perform this enforcement function. The major responsibility of the PCA is to judiciously enforce parking regulations.

The PCA is required to identify a parking violation and determine if the technical violation, in light of the circumstances, warrants a vehicle citation, removal, or no action. The PCA must make this decision based on his/her interpretation of parking regulations, current policy, and prevailing circumstances. The

FIGURE ES-1. TICKET WRITING OPERATION

PCA must also consider the relative safety and transportation impact of the violation in making this decision. Ticket fines vary from $10 and $25. If the violation is serious enough to warrant towing the vehicle, the PCA issues a ticket, places a tow sticker on the rear windshield of the vehicle, and informs the towing dispatcher of the vehicle's location via radio.

D.C. DOT uses a combination of foot and vehicle patrols to enforce parking regulations. The chosen combination of patrols depends upon the area and time of day. During rush hours, enforcement efforts concentrate on ensuring that vehicles do not park on rush hour restricted streets and thus block traffic. Vehicles in violation of these restrictions are generally towed.

Enforcement during the day in the Central Business District (CBD) has three primary objectives:

- policing parking meters to ensure the availability of short-term parking;
- ensuring that loading zones are used only by commercial vehicles for loading; and
- preventing the blockage of fire hydrants, driveways, alleys, entrances, and bus stops.

A PCA is generally assigned to patrol one of the over 50 beats in the CBD. Each beat consists of approximately a three-block by three-block area. The beats are designed to be covered in 30 to 60 minutes. The PCAs are rotated among the various beats to preserve their integrity. Each squad works one area for six to eight weeks. A PCA might work up to ten different beats during this period.

The foot patrols are supplemented at midday (11 a.m. to 1 p.m.) by vehicle patrols. Three PCAs in D.C. DOT vehicles monitor key streets to ensure the flow of traffic during lunch hour.

Washington, D.C., has a large residential parking permit program. Over 1,600 blocks limit parking for non-permit holders to two hours. The vehicle patrols are used to enforce this program. Because of the large number of areas to be covered, each area is not patrolled every day.

Because the violation is time-related, the patrol procedure is different from the procedure employed in the CBD. The PCA drives along a block and records the vehicle license tag and time of observation for each vehicle. The PCA then returns in two hours to see if the non-permit vehicles are still parked in the restricted zone.

Vehicle Immobilization (Booting) Branch

Central to the District's aggressive ticketing policy is "the boot," a device which clamps around the front wheel of a vehicle and prevents the vehicle from being moved. Though D.C. DOT has legal authority to boot vehicles with two or more outstanding parking violations, their policy is to immobilize vehicles with four or more outstanding violations. Vehicles with more than $200 in outstanding fines are towed to ensure fine collection. Since vehicles licensed in D.C. must pay all outstanding fines at vehicle registration time, generally only vehicles not registered in the District are booted. The primary responsibility of the booting branch is to immobilize scofflaws so they will be forced to pay their outstanding parking violations.

The owner of the booted vehicle is required to settle all outstanding parking violations and pay a $25 booting fee at the District Cashier's office. Once the account is settled, the cashier authorizes the booting branch to remove the boot. Vehicles which remain booted for more than five days are towed to an impoundment lot.

FIGURE ES-2. BOOTING OPERATION

Towing Branch

Towing is the third integral part of the District's enforcement program. The actual towing of vehicles is performed by a contractor under the supervision of towing branch personnel. The contractor is required to have 25 cradle cranes available for use in the District between 7 a.m. and 7 p.m. on weekdays. Tow truck operators can have a vehicle ready to be moved off the street in three to six minutes.

The PCAs in the field identify vehicles which have committed towable parking violations. Generally, vehicles parked in tow-away zones or on restricted rush hour streets are selected. The PCA issues a ticket and calls the towing dispatcher with the locations and description of the vehicle. A bright orange tow sticker is placed on the rear window of the vehicle for further identification. The aide continues his patrol. The PCA is not required to wait for the tow truck to arrive. Within 15 minutes, the tow truck arrives and hooks up the vehicle. Vehicles are placed on dollies if required. If the driver returns during

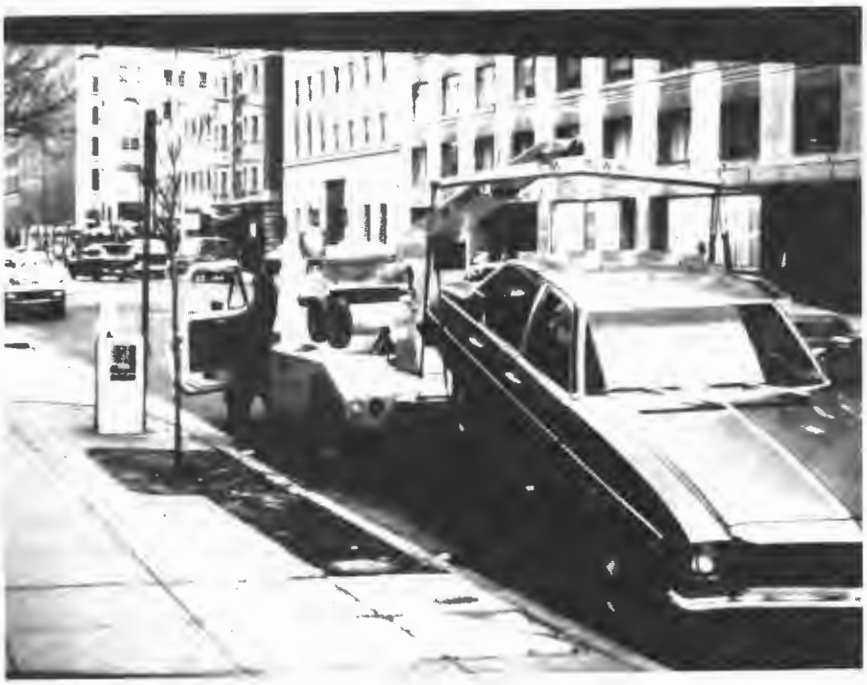

FIGURE ES-3. TOWING OPERATION

this time, the tow truck driver is required to unhook the vehicle and return it to the owner. A towed vehicle is taken to one of the two District impoundment lots. The vehicle is sealed and placed in a numbered stall. D.C. DOT personnel operate the impoundment lots.

In order for the owner to retrieve his vehicle, he must pay the $50 towing fee and any other outstanding traffic violations. This is done at the District Cashier's office and not at the impoundment lot. The owner must present his receipt and proof of ownership before the vehicle is released.

Bureau Of Traffic Adjudication

The Bureau of Traffic Adjudication (BTA) is responsible for the processing of parking and minor violations and the administrative adjudication of contested violations. Beginning in February 1979, BTA was given responsibility for handling violations from both the D.C. DOT and Metropolitan Police Department (MPD) traffic and parking enforcement efforts. The BTA employs approximately 60 people.

Administrative adjudication changed the process of contesting parking (and minor moving) violations. Contesting is now handled in an administrative process rather than a judicial process. The violations are decriminalized, which means they are no longer punishable by incarceration. The ticket becomes a part of a civil suit--the ticket (for the city's interest) vs. the vehicle owner. This case is handled administratively by a hearing examiner. For parking violations, the hearing examiner (who functions in the same capacity as a judge) reviews the ticket and listens to the plea and/or explanation of the vehicle owner. The hearing examiner then renders a decision. In this administrative process, the ticket serves as the city's claim and eliminates the need for a prosecutor and issuing officer to be present.

The other function of the BTA is processing parking and minor moving violations issued in the District of Columbia. This includes record keeping and data processing for the 1.8 million parking tickets and 200,000 moving violations issued annually.

PROGRAM PRODUCTIVITY

D.C. DOT's proposal for the PEP established production targets for the program. This section examines the success of the program in meeting those objectives.

Ticket Writing

When the civilian ticket writing branch was proposed, a goal of 975,000 additional parking tickets per year was set. This number was in addition to the approximately 1.26 million tickets being written by the Metropolitan Police Department (MPD) in 1975. The proposed volume of tickets translates to 3,900 per day, assuming 250 working days per year. During Fiscal Year (FY) 1979 (October 1978 to September 1979), D.C. DOT wrote an average of 3,756 tickets per day, only 3.8 percent below the target. The daily average was increased by 10.7 percent to 4,159 tickets per day during FY 1980, 6.6 percent above the proposed volume.

These production goals were achieved despite the lack of a full complement of PCAs. When the program started it was assumed that each of the 50 PCAs would write 75 tickets per day; however, since the program began, D.C. DOT has been able to place an average of only 38 PCAs per day on patrol due to turnover and absenteeism. Thus with 31.5 percent fewer personnel, D.C. DOT was able to surpass its production goal of 75 tickets per PCA to 96 tickets per PCA (an increase of 28 percent). During FY 1980, the average number of tickets per PCA was further increased to 109 tickets per day.

Booting

D.C. DOT proposed to boot 20,000 vehicles once the enforcement program began. This annual goal translates to 80 bootings per day. They were able to achieve this target by July 1979. The average daily number of bootings was 74 per day during FY 1979. During FY 1980, the average was increased to 97 bootings per day, exceeding the target value of 80 by 21 percent and representing a 31 percent increase over the previous fiscal year.

Towing

The towing goal was set at 112,500 tows per year, based on the assumption that 450 vehicles could be towed daily. This assumption further implied that the fleet of 25 tow trucks would each tow 37 vehicles per day or an average of 1.5 vehicles per hour.

Once the towing portion of the program began, it became apparent that finding 450 violators who were creating a significant traffic flow or safety hazard would be difficult. Although more than 450 technically towable offenses exist, towing a technical violator is more likely to generate ill will than to achieve program goals of increased traffic flow and safety. PCAs are required to make this determination every time they request a tow. Currently, 184 vehicles are being towed per day.

PROGRAM COSTS

The enforcement program costs can be divided into initial capital and operating costs. The initial capital cost for the entire Parking Enforcement Division was $1,970,650. This cost included such items as vehicles, boots, two-way radio equipment, computer hardware and impoundment lot construction. The BTA had an initial capital cost of $1,719,280 for its parking enforcement activities. Approximately 70 percent of this cost was for the purchase of a new computer system for D.C. DOT. The addition of the traffic adjudication process and the increased volume of tickets served as the justification for the purchase of the new system.

The annual operating cost for D.C. DOT parking enforcement activities is summarized in Table ES-1, which shows the annual operating cost for ticket writing, booting, and towing. BTA costs were allocated to each activity based upon that branch's proportion of the total D.C. DOT parking transactions. The table also provides the unit cost per ticket, booting, or towing.

The table indicates that it costs D.C. DOT approximately $1.00 to write a ticket strictly in terms of operating costs. Processing and hearings increase the operating cost to approximately $2.00 per ticket. The average value of a ticket issued by D.C. DOT is approximately $11.40. The average PCA writes a total of 110 tickets per day. Collections are made on approximately 60 percent of all tickets issued. Therefore, it costs $221 to write these 110 tickets, but $752 can be expected to be collected. The net is $531 per day per PCA. From a strictly financial standpoint, ticket writing is cost-effective.

For each booting, total operating costs are $24.40. The booting fee alone is $25.00, and the average booting yields $140 in outstanding tickets for a total of $165 per booting in revenue. Thus booting is cost-effective also.

The total cost per tow is $42.10. With the tow fee at $50, towing costs can be recovered. However, it should be remembered that both towing and booting provide the means to make enforcement effective.

PROGRAM IMPACTS

Violation Rates

The behavior of parkers in both commercial and residential areas has been greatly affected by increased parking enforcement. This change in individual behavior has been reflected most drama-

TABLE ES-1. D.C. DOT PARKING ENFORCEMENT PROGRAM: OPERATING COSTS (Fiscal Year 1980)

	Ticket Writing		Booting		Tows		Total
	Dollars	Dollar/Ticket(a)	Dollars	Dollars/Booting(b)	Dollars	Dollars/Tow(c)	Cost
Operating Costs(d)							
. Parking Enforcement	$1,043,297	$0.99	$570,638	$23.38	$1,891,056	$41.06	$3,504,991
. Violation Processing	827,324	0.79	19,175	0.79	37,067	0.18	883,666
. Adjudication Hearing	238,161	0.23	5,549	0.23	10,670	0.23	254,380
. AC Total Operating Cost	$ 2,108,782	$ 2.01	$ 595,462	$ 24.40	$ 1,938,793	$ 42.10	$ 4,643,037

Notes:

(a) 1,049,664 tickets were written in FY80.

(b) 24,406 vehicles were booted in FY80.

(c) 46,055 vehicles were towed in FY80.

(d) Operating costs include salaries, benefits, utilities, maintenance, uniforms, security guards, printing, contract towing service, and gasoline.

This table has been prepared based on information provided by D.C. DOT. Peat Marwick has not verified this information. The reported cost figures are subject to the assumptions described in the text and the table notes.

tically in the change in violation rates. In two recent surveys the number of violations per block were measured in both commercial and residential areas. Over 20 percent of the block faces in the CBD and selected residential areas were surveyed during midday (10 a.m. to 3 p.m.)

The results of this survey for both the west and east CBD reflect dramatic changes in the incidence of curbside violations. Decreases of 72 and 85 percent were recorded for the west and east CBD, respectively. A closer look at specific violations shows a significant reduction in double parking (91 percent of the west CBD and 94 for the east CBD). This, alone should help to improve traffic flow. The reduction in loading zone violations should increase the availability of these zones for commercial vehicles, thus reducing their need to park illegally while making deliveries. Bus zone violations have also decreased from 0.39 percent block face to 0.07 in the west CBD and from 0.5 to 0.08 in the east CBD. Bus operations should have improved due to this change in parking behavior. These reductions point to a significant change in violation patterns in the CBD since enforcement began.

Similar results were recorded in two close-in residential areas. Large reductions in vehicles parking too close to the intersection (40 feet from the intersection) should improve sight distances for motorists and pedestrians and allow fire fighting equipment more room to maneuver around corners. Overall, violation rates were reduced by 52 percent in the Capitol Hill area and by 29 percent in Adams-Morgan.

PARKING METER REVENUES

When the enforcement program began in 1978, the parking meter rate at most of D.C. DOT's approximately 11,000 meters was 50 cents per hour. The total meter revenue during FY 1978 was approximately $2.78 million, or $258 annually per meter. During FY 1979, after enforcement began, total meter revenue increased to $3.74 million, or $350 annually per meter.

FINANCIAL ANALYSIS

In an effort to capture the financial implications of parking enforcement activities in Washington, D.C., an analysis of incomes and costs has been performed. The total income derived from both D.C. DOT and the MPD parking enforcement effort was approximately $20.9 million in FY 1980. Ticket fines accounted for 88.0 percent of total income, booting fees for 2.6 percent, and towing fees for 9.4 percent. The total operating costs for D.C. DOT were approximately $4.6 million and the estimated MPD operating costs are approximately $870,000. This results in a net income of approximately $14.6 million.

1. INTRODUCTION

PARKING ENFORCEMENT

Parking management tactics have become the focus of renewed attention as potential tools to help achieve transportation system management (TSM) objectives. A parking management tactic is any action taken to alter the supply, operation, and/or parking demand of a jurisdiction's parking system in order to attain local objectives, e.g., improve quality, energy conservation, reduce travel times.

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Along with increased enforcement efforts, several communities have investigated the idea of transferring adjudication responsibilities from city criminal courts to their traffic departments. The advantages of this transfer, much like the use of civilian parking control aides (PCAs), are that the traffic department will place a higher priority on parking enforcement and that records can be centralized in one agency. Another advantage of this concept is that it allows the traffic department to administer penalties that are consistent with its ticketing policies. In some communities, traffic departments have been frustrated in their parking enforcement efforts by courts that fail to impose serious fines on blatant scofflaws and parking violators.

PURPOSE OF STUDY

The Washington, D.C., PEP is probably the most comprehensive parking enforcement effort recently implemented in the United States. Operated by the District of Columbia Department of Transportation (D.C. DOT), this program includes ticket writing, booting, towing and administrative adjudication. This locally implemented

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enforcement program is unique in several aspects. It is one of the few programs which actively links parking enforcement with overall TSM. The program has brought enforcement adjudication into one organization. From an operations standpoint, the program is notable in its use of two-way radio and an on-line computer information system to coordinate enforcement and adjudication.

The Service and Methods Demonstration (SMD) Program has the objective of improving existing transit operations by sponsoring the development, implementation, and evaluation of new techniques and services on a nationwide basis. Increased on-street parking enforcement offers the promise of improving transit operations. The active ticketing and towing of peak-period parking violations helps ensure the availability of the curb lane for transit vehicles. This could improve travel times and reliability. Midday enforcement helps to reduce double parking and keeps bus stops clear of illegally parked vehicles. Additional enforcement also increases the chances of a motorist's being fined for illegal parking. This monetary disincentive could induce some motorists to switch to transit. Further, parking enforcement is an important element of TSM which has not been fully utilized in recent years.

Thus, the D.C. DOT parking enforcement program has offered a unique learning opportunity. SMD has sponsored this evaluation to provide current information on an innovative PEP. The results presented here should enable cities throughout the United States to learn from the Washington experience as they implement their own enforcement programs.

CONCEPTUAL FRAMEWORK

A conceptual framework for evaluating a PEP is shown in Figure 1-1. This figure illustrates the context in which the program can be evaluated by showing its introduction into the existing transportation system.

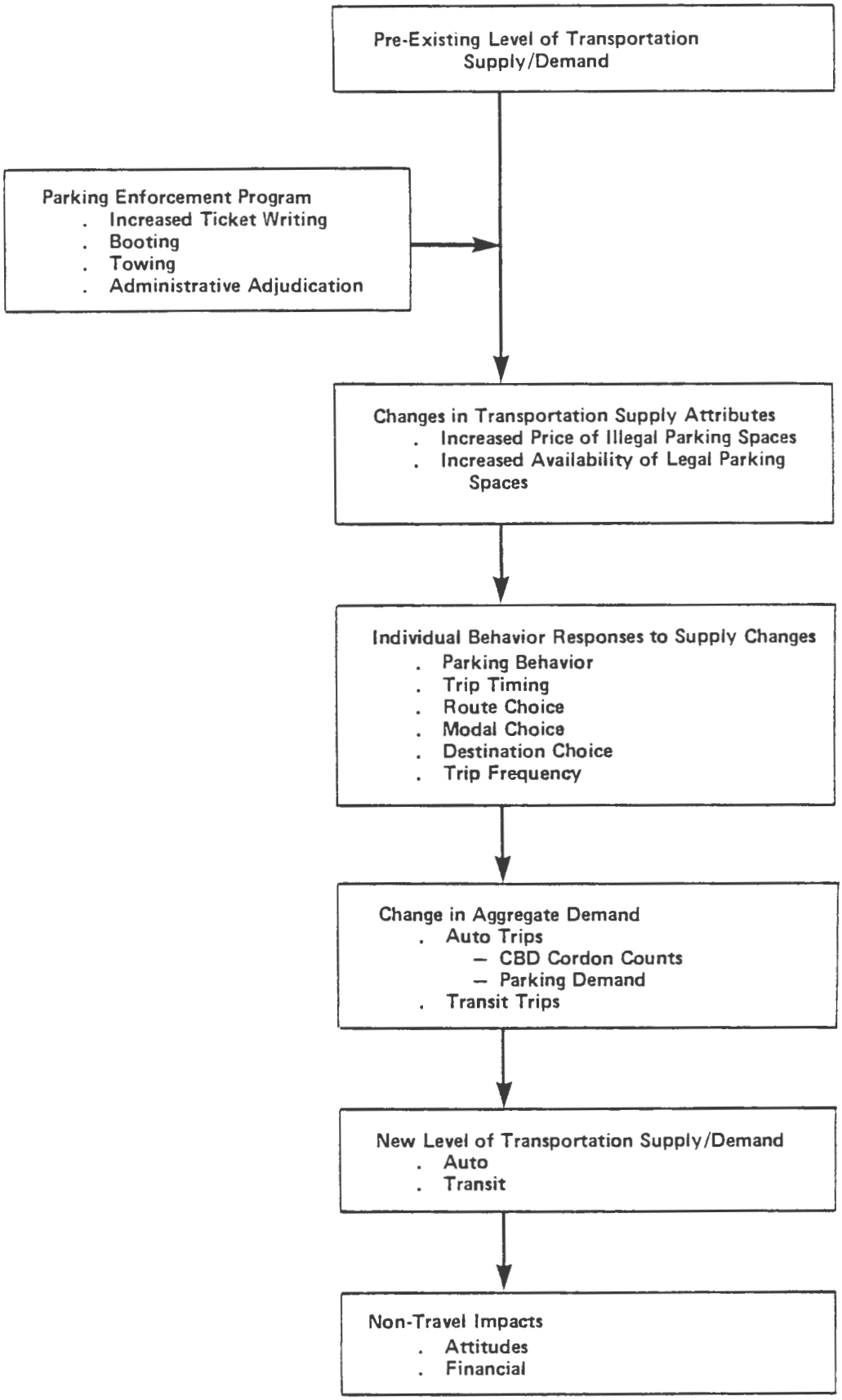


FIGURE 1-1. CONCEPTUAL FRAMEWORK FOR PARKING ENFORCEMENT PROGRAM EVALUATION

The enforcement program consists of four elements:

- increased ticket writing through the use of a dedicated civilian work force;
- increased immobilization of parking scofflaws through the use of a boot (a device which locks to the front wheel of a vehicle and does not allow it to be moved);
- increased towing of vehicles in flagrant violation of parking regulations, especially those vehicles which are creating traffic flow and safety problems; and
- institution of an administrative adjudication system for parking and minor traffic offenses.

The program is designed to change transportation supply attributes in two ways. The first is to increase the price of illegal parking spaces. This is accomplished by increasing the probability that a violator will be ticketed due to a higher level of enforcement. Booting and towing provide additional incentives for the motorist to comply with parking regulations. Second, the enforcement of metered spaces should increase turnover and vacancy rates at these legal spaces.

These changes in transportation supply should produce changes in individual travel behavior. The hypothesized travel behavior changes are presented in Table 1-1. The table shows the expected reaction for eight types of travel behavior stratified by enforcement in commercial and residential areas. The strategies for enforcing these two types of areas are different enough to require this classification. These behavior changes are further stratified in commercial areas by long-and short-duration parkers and in residential areas by residents, less than two-hour duration non-resident parkers, and more than two-hour duration non-resident parkers. The latter classification was selected to account for the Residential Parking Permit Program (RPPP) which allows non-residents to park for a maximum of two hours.

Parking behavior should exhibit the most significant change with the implementation of the enforcement program. The violation rate for all classes of parkers should decrease as the probability of receiving a ticket increases. The willingness to pay parking meters should also increase in commercial areas. The turnover rate should increase for on-street spaces, allowing more on-street opportunities for short-term parkers and forcing long-term parkers into off-street facilities.

TABLE 1-1. HYPOTHESIZED TRAVEL BEHAVIOR CHANGES

Travel Behavior	Enforcement in Commercial Areas: Long Duration (e.g. commuters)	Enforcement in Commercial Areas: Short Duration (e.g. shoppers)	Enforcement in Residential Areas: Resident	Enforcement in Residential Areas: Non-Resident <2 hour duration	Enforcement in Residential Areas: Non-Resident >2 hour duration
Parking Behavior					
. violations	significant	significant	significant	significant	significant
. willingness to pay	significant	significant	none	none	none
. duration	significant	significant	significant	significant	significant
. facility choice	significant	significant	significant	significant	significant
Trip Timing	some	some	some	some	some
Route Choice	some	none	none	none	some
Modal Choice/Auto Occupancy	some	some	some	some	significant
Destination Choice	none	some	none	some	significant
Trip Frequency	none	some	some	some	none
Vehicle Ownership	none	none	some	none	none
Residential Choice	none	none	some	none	none

Trip timing for commuters should be somewhat affected as they adjust their departure time to ensure that they can find an off-street space or change to another mode. Short-duration commercial area parkers may time their trips to miss the peak-period parking restrictions.

Towing of vehicles that are parked during peak-parking periods on restricted streets should help ensure the availability of curb-lane capacity, and the resulting improved traffic flow might influence some parkers to take other routes.

The reduction of available illegal on-street spaces might cause some commuters to shift to transit or other ridesharing arrangements. Conversely, short-duration parkers in both commercial and residential areas might have shifted from transit because of the increased availability of on-street spaces.

In several areas in Washington, D.C., RPPPs were implemented in response to commuters parking their cars and taking transit into the CBD and, for close-in neighborhoods, to commuters parking and walking to nearby employment centers. The increased enforcement of RPPPs might cause these parkers to shift to transit.

The destination choice of the long-duration non-resident parker should be most significantly affected by enforcement in residential neighborhoods. This would be particularly true for non-work long-duration parkers who have many competing destinations--some with ample free parking available. Both commercial and residential area short-term parkers might be attached to areas which now have more available on-street parking. Further, this may somewhat increase trip frequency to these areas.

Increased enforcement in residential areas might produce some increase in vehicle ownership and changes in residential choice for area residents. The increased availability of on-street spaces may influence the decision of some residents to purchase vehicles. Further, the existence of a well-enforced RPPP might influence auto-oriented individuals to purchase a residence in an RPPP area.

Most of the behavior changes described above and in Table 1-1 are subtle and difficult to measure. Parking enforcement is just one of many actions which are concurrently affecting the transportation system in an urban area.

The combination of these individual behavior responses results in changes in aggregate travel demand. Table 1-2 illustrates these hypothesized changes in aggregate demand by the same classes of parkers as shown in Table 1-1. Automobile travel should decrease for long-term parkers because of the increased price of illegal spaces. There should be a corresponding increase in transit trips. Short-duration parkers should make more auto trips, but no change in transit trips should be expected. The increase in auto travel should represent new trips to the areas with better enforcement.

There should be a decrease in demand for on-street parking for both kinds of long-term parkers due to the increased price of illegal on-street parking. For short-term parkers, on-street demand will rise to meet the newly available supply. However, the demand for long-duration off-street parking in commercial areas should remain the same but at a higher price. Better on-street enforcement should produce an increase in this demand. The long-term parker in residential areas will have an increased demand for off-street parking, while short-duration parkers should decrease their demand for short-term off-street parking due to the increased availability of on-street spaces.

Referring back to Figure 1-1, these changes in aggregate demand will result in a new level of transportation supply and demand. The primary result for auto users will be the increase in price for illegal parking. The second result, which will benefit both transit buses and automobiles, should be faster travel times and increased travel time reliability due to the effective enforcement of peak-period restrictions.

The final links in the conceptual framework are the non-transportation impacts of the enforcement program. These are demonstrated in two areas. The first area is the business and residential communities' reaction and attitudes toward the PEP. Public pressure can have a great effect on the program. The second area is the financial impact of the program. Effective enforcement programs cannot help but be viewed as revenue generators.

The conceptual framework for evaluating a PEP described in the previous subsection establishes the context in which this analysis took place. The conceptual framework is an attempt to describe the expected impacts of the program and identify the impact variables which should be measured.

TABLE 1-2. HYPOTHESIZED CHANGES IN AGGREGATE DEMAND

Aggregate Demand	Enforcement in Commercial Areas		Enforcement in Residential Areas		
	Long Duration (e.g. commuters)	Short Duration (e.g.shoppers)	Resident	Non-Resident <2 hour duration	Non-Resident >2 hour duration
Automobile Travel					
. Cordon Crossings	decrease	increase	none	increase	decrease
. Parking Demand					
. On-Street	decrease	increase	none	increase	decrease
. Off-Street	same at higher price	decrease	none	decrease	increase
Transit Trips					
. Cordon Crossings	increase	none	none	none	increase
. Trips	increase	none	none	none	increase

Of course, not all of these impact variables were measured in this study because of the unavailability of appropriate "before" data and the difficulty of controlling for other transportation system changes which took place in the same period. An overview of the available data sources is found in Table 1-3. For each impact area in the conceptual framework, the table presents information on the required data and their availability. Though data are available for all impact areas, information is limited in several areas. This is especially true for individual travel behaviors and aggregate demand changes.

SCOPE OF ANALYSIS

This evaluation study differs from most SMD program evaluation studies undertaken by the Transportation System Center (TSC) in that it evaluates a program which was already implemented before the evaluation began. Further, the Washington, D.C., PEP was implemented concurrently with other events which have had a great impact on transportation in the Washington, D.C., area -- the most significant of which is the continued expansion of the regional heavy-rail transit system.

Thus, this analysis is handicapped by the following factors:

- Since this is an after-the-fact evaluation, a formal experimental design which would capture conditions before and after the program, appropriately accounting for concurrent effects, could not be developed;

- The evaluation is totally dependent upon the availability of "before" data and information for assessing the program; and

- The subtlety of the changes in many aspects of travel behavior that could result from PEP makes the changes difficult to measure.

Throughout the evaluation, every effort has been made to seek data and information which could substantiate the hypothesized impacts described in the conceptual framework. However, as illustrated in Table 1-3, adequate data were not always available. Table 1-4 indicates the extent to which each impact area was assessed. Adequate information existed for the assesment of the following four areas: (1) parking enforcement programs; (2) transportation supply attributes; (3) parking behavior; and (4) non-travel impact. A limited assessment was performed in the

TABLE 1-3. OVERVIEW OF DATA SOURCES

IMPACT	DATA REQUIRED	DATA AVAILABILITY
PARKING ENFORCEMENT PROGRAM		
A. Organizational Structure	. Position description . Organization Chart	D.C. DOT records
B. Planning		
1. Institutional Environment	. Correspondence and meeting with appropriate agencies and groups	. Interviews with D.C. DOT, MPD and other appropriate agencies.
2. Planning Process	. Same as B.1	. Interviews with D.C. DOT
	. Technical reports	. D.C. DOT records
3. Approval Process	. Same as B. 1	. Interviews with D.C. DOT, MPD and other appropriate agencies
C. Implementation		
1. Interagency coordination	. Correspondence and meetings with appropriate agencies and groups	. Interviews with D.C. DOT, MPD and other appropriate agencies
2. Training	. Training material	. D.C. DOT records
D. Costs by Branch	. Actual expenditures	. D.C. DOT records
E. Revenues from parking tickets, boots, tows, parking meters and parking tax	. Actual revenue	. D.C. Treasurer records
F. Productivity		
1. Ticket Writing	. Number of tickets written . Revenue per ticket . Revenue per PCA	. D.C. DOT records
2. Booting	. Number of vehicles booted . Average revenue per booting	. D.C. DOT records
3. Towing and Impoundment	. Number of vehicles towed . Cost per tow . Revenue per tow . Number of vehicles damaged when towed . Number of vehicles damaged in lot	. D.C. DOT records
4. Adjudication	. Number of parking related uses . Number of cases handled	. D.C. DOT records
TRANSPORTATION SUPPLY ATTRIBUTES		
A. Illegal On-Street Parking Spaces	. Violations per block face	. D.C. DOT records . Peat Marwick parking violation survey
B. Legal On-Street Parking Space	. Turnover . Parking Meter Utilization	. D.C. DOT records . Peat Marwick parking violation survey
C. Travel Times	. Travel time by mode	. Limited descriptive information
TRAVEL BEHAVIOR		
A. Parking Behavior		
1. Violations	. Violations by type . Violations per block face	. D. C. DOT records . Peat Marwick parking violation survey
2. Willingness to Pay	. Meter revenues	. D.C. DOT records
3. Duration	. Turnover	. D.C. DOT records
4. Facility Choice	. Facility choice	. No "before" data
B. Trip Timing	. Time of day of trips	. No "before" data
TRAVEL BEHAVIOR		
C. Route Choice	. Route of trip	. No " before" data
D. Modal Choice	. Choice of mode	. No related "before" data
E. Destination Choice	. Destination of trips	. No "before" data
F. Trip Frequency	. Number of trips	. No "before" data
G. Vehicle Ownership	. Vehicles per household	. No related "before" data
H. Residential Choice	. Reasons for choice of residential location	. No " before" data
AGGREGATE DEMAND		
A. Automobile Demand	. Automobile trips by area . Cordon counts	. Annual cordon counts
B. Parking Demand		
1. On-Street	. Turnover	. D.C. DOT records
2. Off-Street	. Parking tax revenues	. D.C. DOT records
AGGREGATE DEMAND		
C. Transit Demand	. Transit trips by area . Cordon counts	. Annual cordon counts
NON-TRAVEL IMPACTS		
A. Attitudes	. Major interest group reactions	. Interviews with major interest groups
B. Financial	. Revenues and costs	. D.C. DOT

TABLE 1-4. IMPACT AREAS ASSESSED

IMPACT AREA	ASSESSED	LIMITED ASSESSMENT	NOT ASSESSED
. Parking Enforcement Program	●		
. Transportation Supply Attributes	●		
. Travel Behavior - Parking Behavior	●		
- Other Travel Behavior			●
. Aggregate Demand			●
. Non-Travel Impacts	●		

area of aggregate demand. Only the impact area of non-parking related individual travel behavior changes was not assessed due to the lack of data.

ORGANIZATION OF REPORT

Including this introduction, this report is divided into eight sections. Section 2 discusses the setting in which the PEP was implemented. Population, land use, employment, and transportation system characteristics of Washington, D.C., are described.

Section 3 traces the evolution of the program from the definition of the problem to early stages of implementation.

In Section 4, the daily operations of the Ticket Writing, Booting, and Towing Branches and the Bureau of Traffic Adjudication are described.

Section 5 addresses the productivity and cost-effectiveness of the new parking enforcement process.

Section 6 discusses the changes in parking supply and individual travel behavior as a result of the enforcement program.

Section 7 assesses the non-travel impacts of the program. The reactions of selected interest groups to the program and its financial implications are described.

Section 8 discusses the implications of this program for other urban areas.

2. THE WASHINGTON, D.C., SETTING OF THE PARKING ENFORCEMENT PROGRAM

This section describes the setting for the implementation of the Washington, D.C., parking enforcement program (PEP). Background information on population, employment, land use, and the transportation system in the Washington, D.C., area is provided and the implications of these factors for parking enforcement are discussed.

BACKGROUND

Located between Maryland and Virginia, the District of Columbia covers 61.4 square miles of land (see Figure 2-1). The District is unique in that it functions both as a city and as a state. Under a limited form of "home rule," District voters elect a mayor, a representative to Congress, and a city council. The District receives a considerable amount of federal funding which is processed in the same manner as for states. However, the U.S. Congress still retains control over the D.C. budget as well as a veto over city council legislation.

POPULATION

Like many other American cities, the District showed a decline in population between the 1970 and 1980 census. In 1970, the District's population was 756,510; in 1980 the census reported the population at 635,233, a decrease of approximately 16 percent. The population decline can partially be attributed to the high cost of housing and tax rates. The average sales price of a house is in excess of $100,000 and personal and property tax rates are considerably higher than in surrounding jurisdictions in Maryland and Virginia.

Household size, like population, decreased in the District in the past few years. In 1970, the average household size was 2.72; in 1977 it decreased 8.8 percent to 2.48, echoing the trend of cities nationwide. Household size is decreasing as couples wait longer to have children and then have fewer children. Additionally, inflation and the high cost of living are causing the number of two-income households to rise.

EMPLOYMENT

The Washington metropolitan area is primarily a government and service-based economy with little industrial base. In the District of Columbia, the Federal Government accounts for

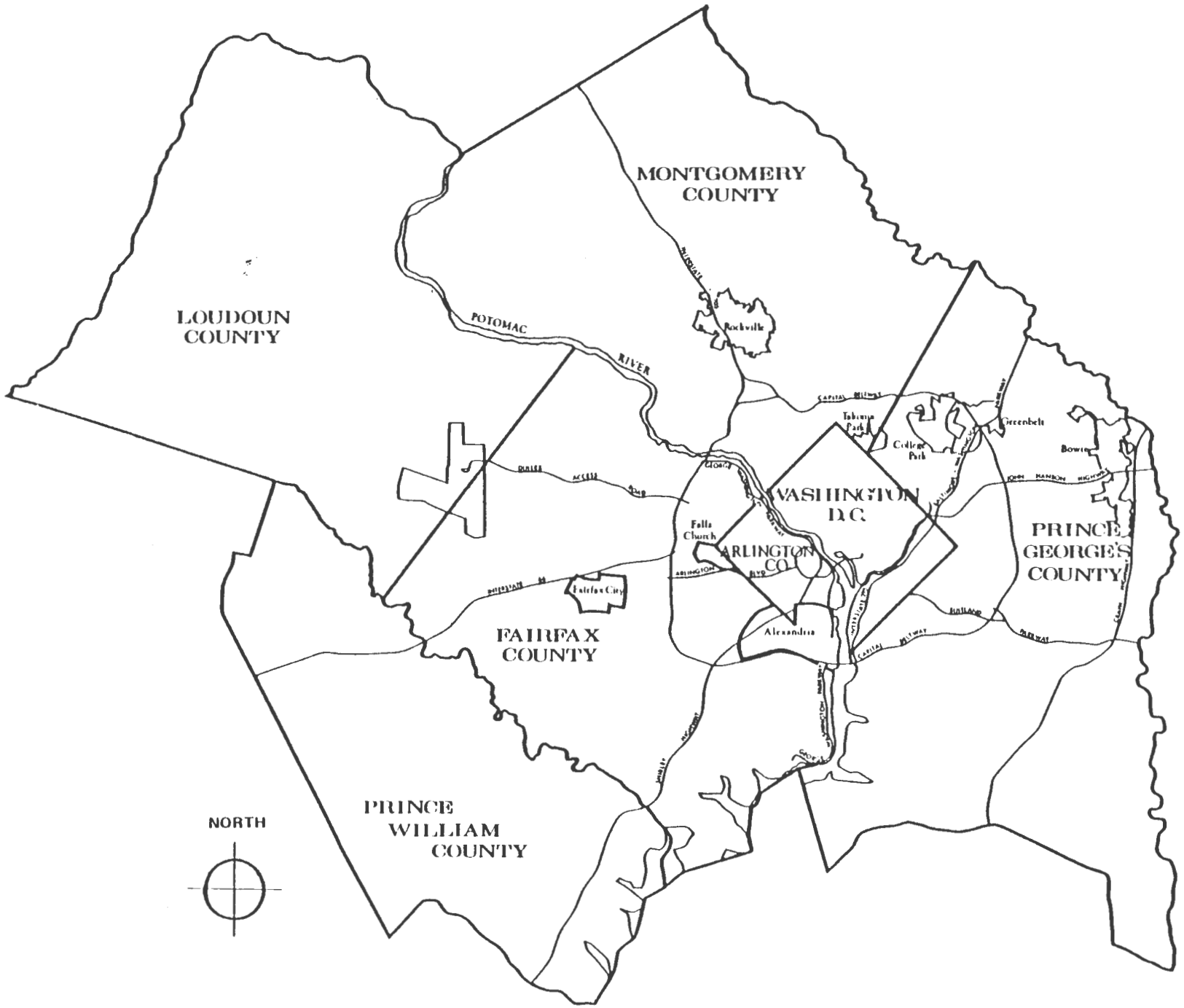


FIGURE 2-1. METROPOLITAN WASHINGTON AREA

approximately 38 percent of employment. In October 1978, 233,200 of the 617,300 persons employed in D.C. worked for the Federal Government. Service employees constitute the second largest category of workers, with 180,700 persons or 29 percent of total employment. Only 5 percent of all persons employed in the District work in the areas of manufacturing and construction. Total employment has grown by 8.9 percent between 1970 and 1978.

LAND USE

Since 1971, approximately 16 million square feet of new office space has been constructed in the District. Generally, the west end of the central business district (CBD) has been the focus of this expansion (Figure 2-2). However, the east CBD has recently been scheduled for an extensive commercial and retail redevelopment. The east CBD projects include the redevelopment of the area along Pennsylvania Avenue and the construction of a downtown convention center.

In addition to the growth of office and retail areas, residential neighborhoods have gone through extensive redevelopment in the last decade. Close-in neighborhoods such as Dupont Circle, Capitol Hill, and Adams-Morgan have been locations of extensive renovation.

TRANSPORTATION SYSTEMS

Street System

Washington, D.C., is a carefully planned city. Its streets follow a basic grid system: numbered streets run north-south and lettered streets run east-west. Avenues named for the states run diagonally across the city. The District has a very limited expressway system, and most travel occurs on the major arterials. These major arterials are subject to peak-period parking restrictions, and many make use of reversible lanes to increase capacity in the direction of peak travel. The Potomac River, which borders the District to the south, restricts incoming traffic from Virginia to a limited number of bridges. Approximately 445,000 automobiles enter the metropolitan core on a typical day.

Public Transportation

The Washington Metropolitan Area Transit Authority (WMATA) operates a rail and bus transportation system in D.C. and the surrounding areas. In 1976, WMATA began service on the first 5.7 miles of the planned 101-mile Metrorail system for the region

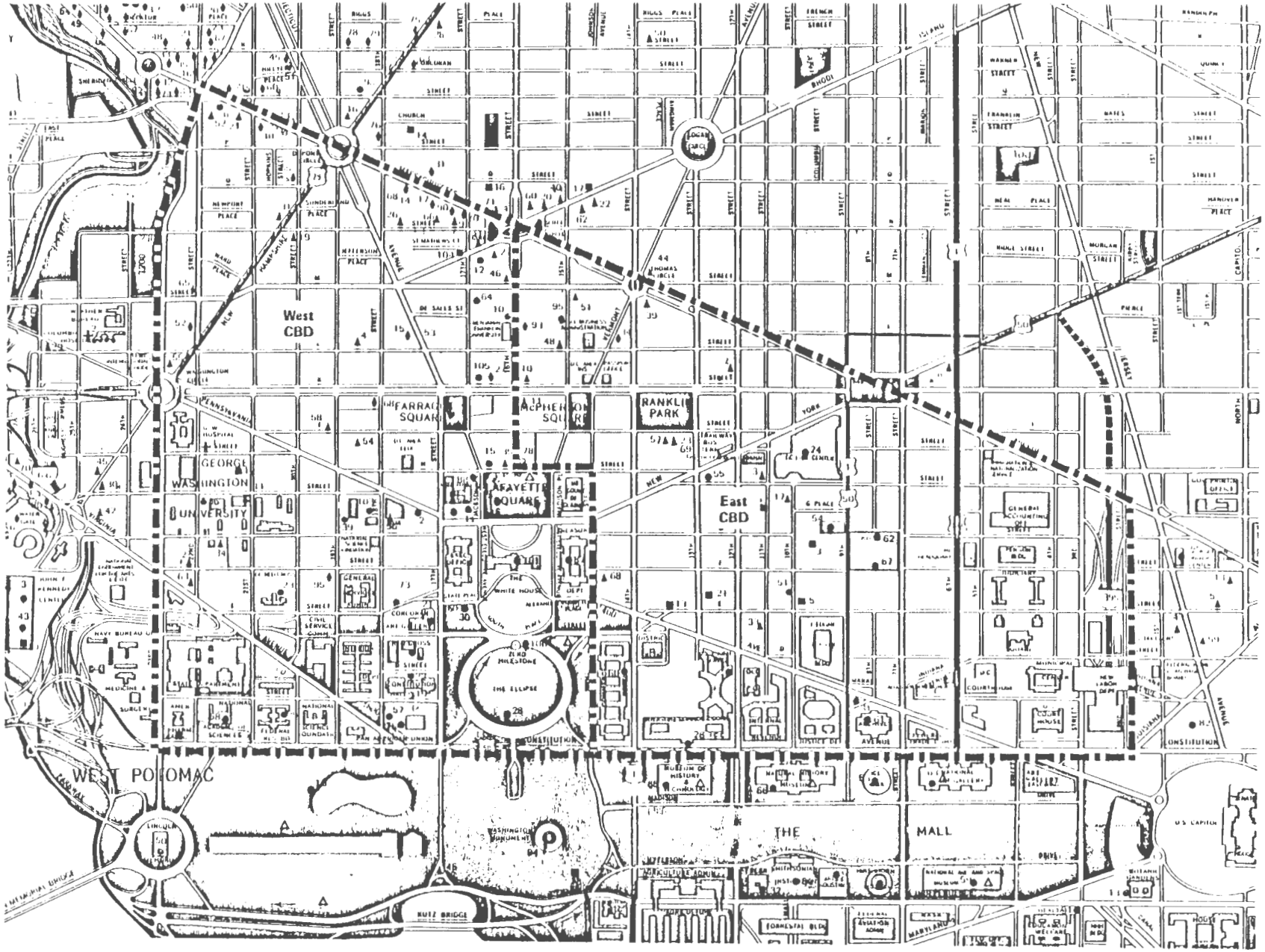


FIGURE 2-2. WASHINGTON, D.C., CENTRAL BUSINESS DISTRICT

(see Figure 2-3). In 1978, Metrorail service included 23.3 miles and 29 stations. A total of 37,287,000 passengers were carried. By May 1980, service had expanded to 33.6 miles and 38 stations serving 74,681,000 passengers annually. In addition, WMATA ran 54,459,000 scheduled bus miles with a fleet of 1,810 buses in 1980. Annual bus ridership has increased from 112,599,000 in 1978 to 149,224,000 in 1980. Overall, the number of persons using transit to the metropolitan area has risen from a daily figure of 170,890 in 1978 to 221,715 in 1980. The percent of work trips by transit has risen from 20.5 percent to 25.3 percent between 1978 and 1980.

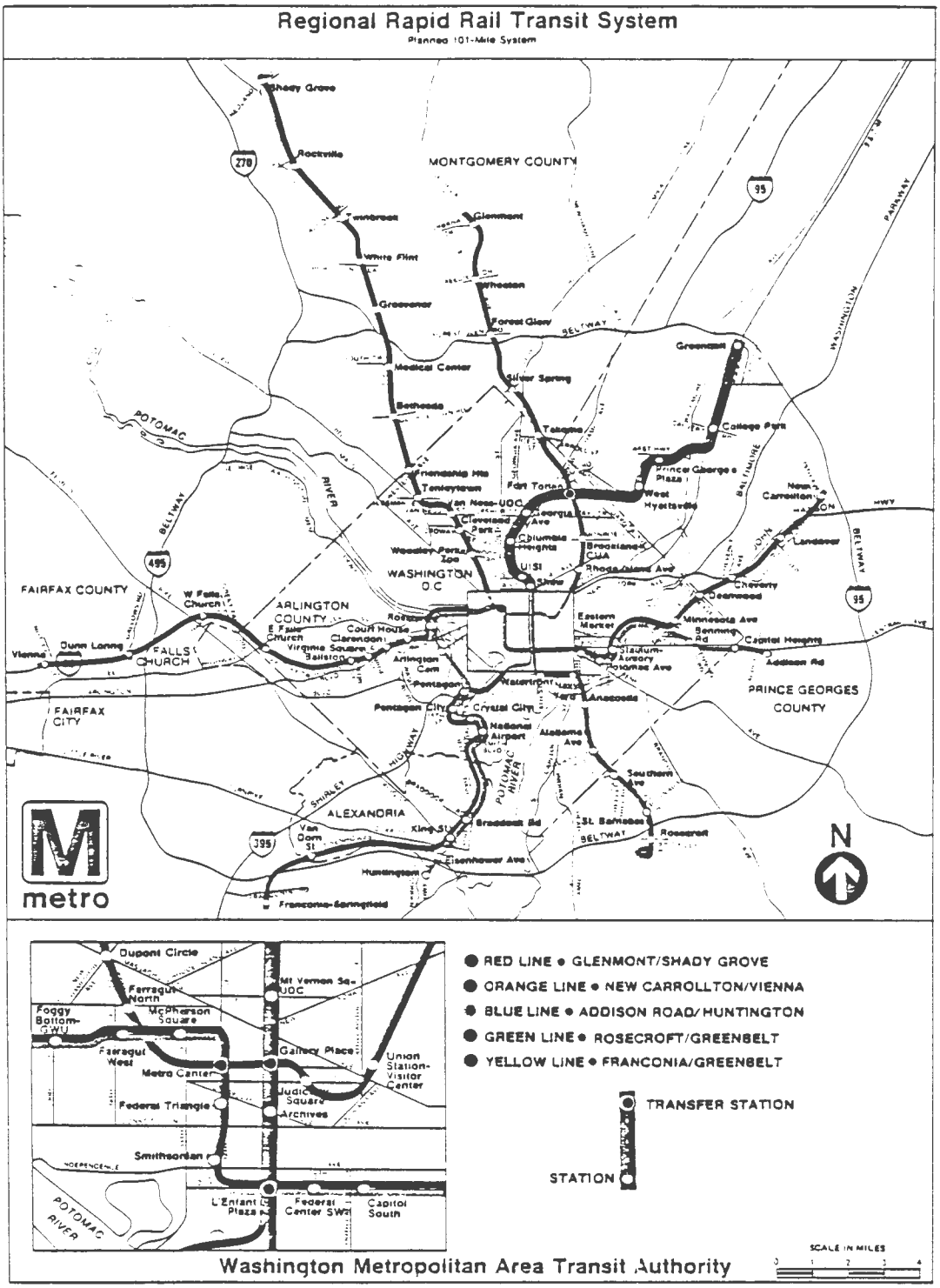
In addition to the bus service WMATA offers, there are commuter buses that provide subscription service between the downtown business area and outlying areas (such as Reston, Va., and Columbia, Md.). Train service is provided by Amtrak, Conrail, and B&O between D.C. and Maryland, Virginia, West Virginia, and the Northeast Corridor.

PARKING

On-street parking is the major source of parking in the District. Most on-street spaces in commercial areas are controlled by approximately 12,000 parking meters. In the CBD, which has 9,000 meters, the spaces cost 75 cents per hour and parking is limited to one hour. Additional restrictions are placed on the use of these spaces during the morning and afternoon peak-travel periods.

Many residential area on-street parking spaces are regulated by an extensive residential parking permit program. This program which began in 1976 permits only those residents whose vehicles display the appropriate permit sticker to park for more than 2 hours. Figure 2-4 shows the areas where the program is in effect.

Commercial off-street parking is concentrated in the CBD. All off-street spaces which are available to the public for a fee are provided by the private parking industry. The District Government is prohibited by law from owning or operating for a fee public use off-street parking; however, the District imposed a 12 percent tax on these spaces in the early 1970s. Table 2-1 illustrates the changes in CBD parking supply between 1978 and 1980. The greatest loss in CBD parking has been in private spaces which decreased in the entire CBD by 25.3 percent. This reduction was primarily due to the loss of private lots and apartment building spaces to new commercial development. The availability of public spaces has barely changed since 1978, decreasing by only 6.8 percent from 68,999 to 64,339 spaces.



Operating Metro Stations

Red Line
- Silver Spring
- Takoma
- Fort Totten
- Brookland-CUA
- Rhode Island Ave
- Union Station-Visitor Center
- Judiciary Square
- Gallery Place
- Metro Center
- Farragut North
- Dupont Circle

Blue Line
- Stadium-Armory
- Potomac Ave
- Eastern Market
- Capitol South
- Federal Center SW
- L'Enfant Plaza
- Smithsonian
- Federal Triangle
- Metro Center
- McPherson Square
- Farragut West
- Foggy Bottom-GWU
- Rosslyn
- Arlington Cemetery
- Pentagon
- Pentagon City
- Crystal City
- National Airport

Orange Line
- New Carrollton
- Landover
- Cheverly
- Deanwood
- Minnesota Ave
- (Stadium-Armory through Rosslyn same as Blue Line)
- Court House
- Clarendon
- Virginia Square
- Balliston

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FIGURE 2-3. METRO RAIL SYSTEM

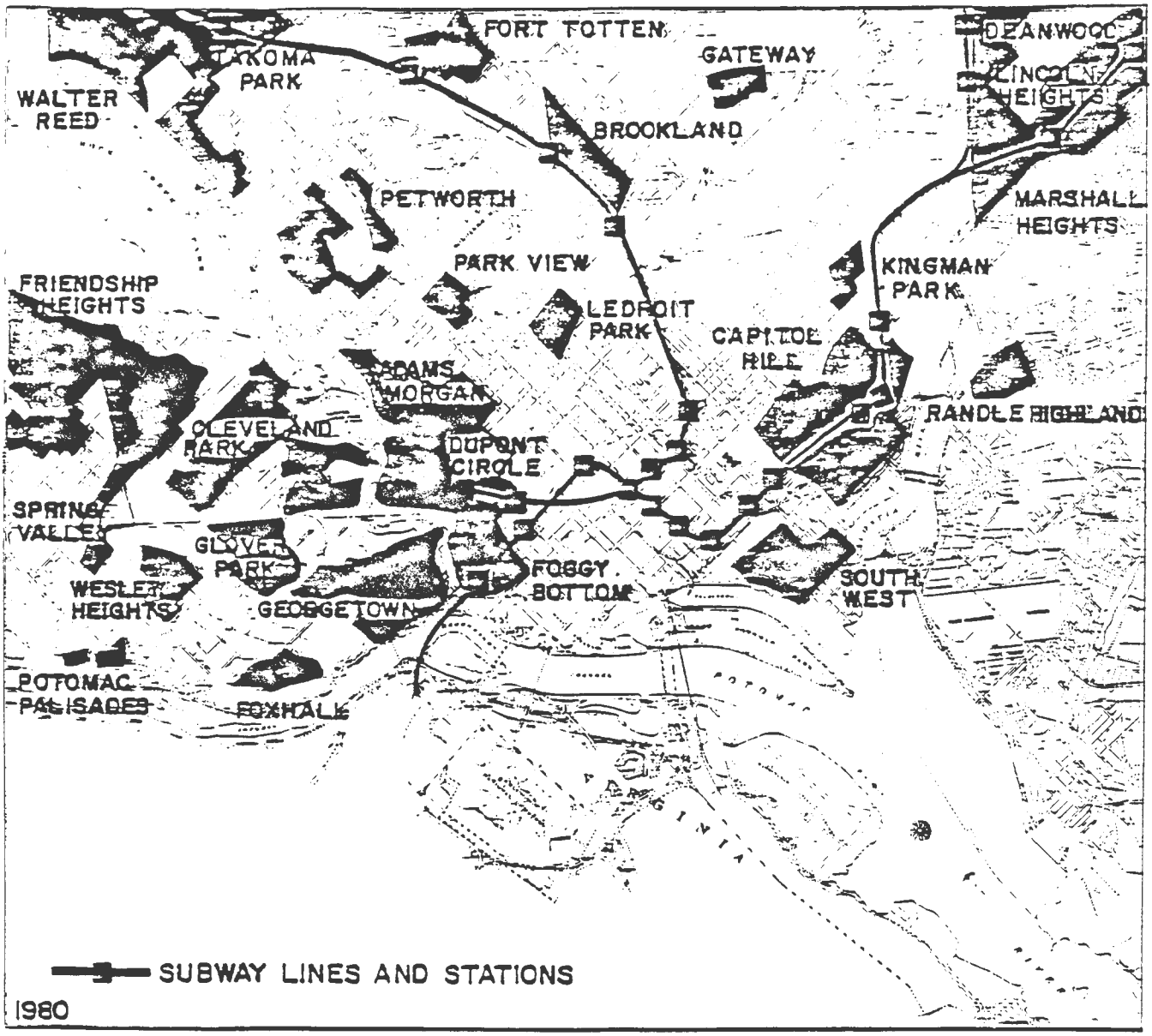

FIGURE 2-4. RESIDENTIAL PERMIT PARKING AREAS IN WASHINGTON, D. C.

TABLE 2-1. OFF-STREET PARKING SUPPLY

Location and Type	1978 (# of Spaces)	1980 (# of Spaces)	Percent Change
. West CBD			
Public Spaces	23,117	23,152	0.2
Private Spaces	10,527	8,433	-19.9
Government Spaces	4,469	4,503	0.8
Total	38,113	36,088	- 5.3
. East CBD			
Public Spaces	19,375	18,639	- 3.8
Private Spaces	4,661	2,905	-37.7
Government Spaces	6,850	6,707	- 2.1
Total	30,886	28,251	- 8.5
. Entire CBD			
Public Spaces	42,492	41,791	- 1.6
Private Spaces	15,188	11,338	-25.3
Government Spaces	11,319	11,210	- 1.0
Total	68,999	64,339	- 6.8

Source: D.C.DOT

During the same period, the average daily price of parking in the CBD has risen 27 percent, from $3.36 to $4.26. The first hour of parking has risen from $1.12 to $1.48. Thus at 75 cents per hour, an on-street metered space is one-half the cost of an off-street space. But eight hours at a meter would cost $6.00. It would be expected that short-term parkers will look for on-street spaces and long-term parkers would be attracted to off-street commercial lots.

TRAVEL DEMAND AND MODE SPLIT

Every spring, the Metropolitan Washington Council of Governments (MWCOG) conducts an annual count of the number of people and vehicles entering the central employment area of the region. This cordon count is conducted over a 13-hour period beginning at 6:00 a.m.

The results of the 13-hour counts for the years 1975 through 1980 are shown in Table 2-2 The table indicates a 5.5 percent increase in the total number of people entering the core from 1978 to 1980 but a decrease of 9.9 percent in the number of persons entering by auto. The percentage of transit trips has risen from 20.5 percent in 1978 to 25.3 percent in 1980. Persons arriving by transit have increased by approximately 30 percent in the same time period.

An analysis of the a.m. peak period (6:30 a.m. - 9:30 a.m.) shows similar results. Table 2-3 shows an increase of 7.7 percent in the number of persons entering the core. The number of persons entering by transit has increased by 27.7 percent between 1978 and 1979. Auto occupancy has risen from 1.45 to 1.49 persons per vehicle.

Other events have occurred concurrently with the PEP which have also had an effect on travel demand in the Washington, D.C. area. The most significant factor has been the expansion of Metrorail service in the region. Increased fuel and parking costs have also affected travel demand. Both parking enforcement and these other events have combined to produce an environment which is more conducive to transit usage and ride-sharing than to the use of a single-occupant automobile.

IMPLICATIONS

The high level of new development in the CBD and the revitalization of various residential neighborhoods has placed increasing demands upon the transportation system. The implementation of new transit service has satisfied a portion of this new demand. However, a high level of congestion continues to exist in both commercial and residential areas. Given that a major investment in transit is underway and no new roads will be built in the District, the improved management of the existing system is one of the few remaining options available for reducing congestion.

TABLE 2-2. WASHINGTON DC METRO CORE INBOUND CORDON COUNT (6 a.m. to 7 p.m.)

Year	Persons	Persons by Auto	Autos	Auto Occupancy	Persons by Transit	% Trips by Transit
1975	802,770	628,000	449,300	1.40	157,000	19.6
1976	815,640	639,000	453,870	1.41	159,880	19.6
1977	804,000	625,540	447,905	1.40	161,910	20.1
1978	832,282	643,592	466,330	1.38	170,890	20.5
1979	837,137	623,078	444,505	1.40	186,865	22.3
1980	877,955	637,235	445,200	1.43	221,715	25.3

Source: Metropolitan Washington Council of Governments, "Metro Core Cordon Count of Vehicular and Passenger Volumes, Summary of Findings", 1975-1980.

TABLE 2-3. WASHINGTON DC METRO CORE AM PEAK PERIOD INBOUND CORDON COUNT

(6:30 a.m. to 9:30 a.m.)

Year	Persons	Persons by Auto	Autos	Auto Occupancy	Persons by Transit	% Trips by Transit
1975	359,190	254,500	180,900	1.41	99,500	27.7
1976	365,440	262,850	182,380	1.44	97,765	26.8
1977	357,340	254,180	176,100	1.44	98,025	27.4
1978	368,245	258,225	178,570	1.45	104,870	28.5
1979	376,235	257,530	176,660	1.46	113,130	30.1
1980	396,450	256,700	171,780	1.49	133,900	33.8

Source: Metropolitan Washington Council of Governments, "Metro Core Cordon Count of Vehicular and Passenger Volumes, Summary of Findings", 1975-1980.

3. EVOLUTION OF THE WASHINGTON, D.C. PARKING ENFORCEMENT PROGRAM

RECOGNITION OF THE NEED FOR BETTER PARKING ENFORCEMENT

In 1972, the District of Columbia Department of Transportation (D.C. DOT) conducted a review of existing parking regulations. It concluded that the regulations were not effective and that they did not promote the City's transportation goals. D.C. DOT discovered that long-term (commuter) on-street parking was not discouraged by the regulations themselves nor by the existing enforcement of these regulations. Commuter parking impacts were also felt by the business community and residential neighborhoods. Frustrated shoppers, denied access to short-term parking, would park illegally. This led to increased traffic congestion and decreased safety. Neighborhoods which are close-in or close to transit routes were inundated with commuter automobiles.

In commercial areas, D.C. DOT made several efforts to help solve these problems. The 1972 survey discovered 1000 spaces in the CBD which were totally unregulated by time limits. In order to better control these spaces, D.C. DOT increased the number of parking meters by 60 percent, from 6,728 meters in 1972 to 10,786 meters in 1978. These efforts reduced the number of unregulated spaces to approximately 50.

The survey also determined that many of the existing parking restrictions were no longer relevant due to changing land use and travel patterns. Efforts were made to update these restrictions.

During this same period, the theft of parking meter revenues was discovered. A new security system was installed in 1976. Part of this system included the monitoring of revenue collection through the use of parking turnover and occupancy studies. These studies were used to estimate the expected revenues from a particular set of meters. They revealed that theft had been eliminated but overtime parking was responsible for an even greater loss in parking meter revenue.

The problem of nonresident parking in various neighborhoods throughout the District was addressed by the passage of enabling legislation for a residential parking permit program in October 1974. The first four permit areas were implemented by the summer of 1976. Local legal actions against the program delayed further implementation until August 1977. The October 11, 1977, ruling by the U.S. Supreme Court stated that a similar residential

parking permit program in Arlington, Virginia, was valid. This removed any doubt about the legality of the program. Currently over 15 percent of all residential streets in the District are covered by the program. (See Figure 2-4 in previous section). The program has been effective in reducing non-resident parking but requires continuing enforcement.

Thus, the District was faced with a continuing enforcement problem in commercial areas. The business community needed more short-term parking and easier access for loading and unloading. The residents were happy with the residential parking permit program and wanted it to remain effective. Further, the local transit property had also complained about illegal parking interfering with bus operations.

D.C. DOT determined that the key to resolving the parking problem in the business and commercial sections of the District was stricter enforcement that would force the long-term parker into off-street facilities. This would free on-street spaces for short-term parking. The expected higher turnover at these on-street spaces would give drivers more opportunity to park legally. The enforcement effort would also encourage a driver to think twice about parking illegally. Increased revenues from parking citations and meters was also attractive to the District government. Better enforcement of the residential parking permit areas would ensure the continued success of that program.

Development of the Solution

In the fall of 1976, D.C. DOT began to explore the true magnitude of the problem and develop potential solutions. Surveys of parking violations revealed the extent of the problem. In nine residential neighborhoods an average of two illegally parked vehicles was found per block face. In the CBD, five illegally parked vehicles were observed per block face.

During 1976, D.C. DOT began to determine the parameters of their program. It became apparent that the enforcement program would involve transferring some parking enforcement authority from the Metropolitan Police Department (MPD) and most traffic adjudication functions from the court system. Both MPD and the traffic court were consulted early in the development process to gather their input and to ensure their concurrence for the final program design. All three parties made several trips to observe how other cities were dealing with parking enforcement and administrative adjudication. It was determined that for the District a single integrated program bringing together all aspects of parking enforcement would be most effective.

A proposal* was submitted to the Mayor in April 1977 outlining the proposed enforcement program. The program contained four key elements:

- adding a civilian ticket writing force to supplement police efforts in ticketing;
- increasing towing and impoundment to keep traffic lanes clear and safe;
- increasing booting to catch those who habitually refuse to pay tickets; and
- decriminalizing parking and minor traffic violations and replacing the trial process with an administrative hearing except in certain very serious cases.

The underlying concept was that all four elements would be brought into one department (D.C. DOT). This would place all parking enforcement activities--from issuing the ticket to final processing--within one agency. Parking enforcement would be centralized and coordinated with transportation and other local goals and objectives.

The civilian ticket writing force was viewed as a supplement to existing police efforts. Although parking enforcement by police is large (1.53 million tickets in 1976), it cannot necessarily be concentrated and consistent. MPD's primary role is law enforcement. The use of police officers solely for parking enforcement was perceived as a misapplication of resources. The civilian ticket writers would be dedicated to parking enforcement. This force could be applied in a concentrated and consistent manner to meet enforcement objectives at a much lower cost.

Major parking enforcement problems in the District were the violation of peak-period parking restrictions and the blocking of driveways, alleys, loading zones, entrances, and bus zones. Issuing tickets to these types of violators may provide a future deterrent, but the vehicle is still left on the street causing a

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* Improved Parking and Traffic Enforcement in the District of Columbia, prepared by the Metropolitan Police Department, Office of the Corporation Counsel and D.C. Department of Transportation, April 1977.

traffic, access, or safety problem. Thus, an increase in towing and impoundment was proposed. D.C. DOT chose to use a towing contractor rather than to make the investment in equipment; however, the contractor could not tow any vehicle unless authorized by D.C. DOT or MPD.

The District already had a large number of parking scofflaws, especially due to the lack of reciprocity with Maryland and Virginia. Further, it was anticipated that increased enforcement would aggravate this problem. Thus, increased booting was proposed as the threat behind the ticket to help ensure better compliance.

The development of an administrative adjudication process had two objectives. The first objective was to decriminalize parking and minor traffic violations in order to unburden the criminal court system of these types of cases. The second objective was to augment the violation processing to handle the expected increase in ticket volume. D.C. DOT was already responsible for maintaining vehicle and driver registration records. The addition of parking and traffic violations processing would centralize all records related to motor vehicles.

The proposal also contained production goals, expected revenues, and program costs for each of four elements. The proposed program survived the review process basically intact. A complete description of the parking enforcement program is found in Section 4 and a discussion of these goals and the effectiveness of the program in achieving these goals is in Section 5.

PROGRAM IMPLEMENTATION

Hearings on the proposed enforcement program were held in the summer and fall of 1977. Parking enforcement has an impact on the following four major interest groups:

- resident population;
- municipal and regional agencies;
- business community; and
- non-resident commuter and visitors.

During the hearings, comments were received from all but the last group.

For the most part, District residents were supportive of the program. The enforcement program was seen as offering three benefits:

- Increased enforcement of the residential parking permit program would ensure the continued success of this program;
- Use of civilian enforcement personnel would free police officers to pursue more serious crime; and
- Increased revenues would help to ameliorate the city's financial situation.

The municipal agencies most affected by the program are MPD and the traffic court. Because both parties were involved in the development of the program, they were supportive throughout the hearings.

The business community in Washington was generally positive toward the program but expressed certain concerns. Parking enforcement has been shown to favor the short-term shopper who needs to find a place to park but adversely affects long-term parking employees. The CBD business community was concerned that the city recognize the competition between city and suburbs for location of businesses. The major competitive factors are:

- Employees can find new jobs or demand subsidized off-street parking if access becomes too difficult;
- Shoppers can patronize suburban malls where parking is free; and
- Businesses can relocate.

Business representatives stressed that any municipal policies must recognize the fundamental importance of the automobile and the relatively limited mobility offered by public transportation (if available at all). This problem can be particularly acute for service industries such as restaurants that are heavily dependent on evening and weekend patrons. Similarly, employees of service industries must travel during off-peak hours (including late evening hours) when transit service is relatively low (compared with typical rush hour service).

The non-resident commuter is most affected by the enforcement of residential parking permit programs and efforts to prohibit illegal all-day parkers. As a political force, non-residents cannot directly influence decision-makers as they cannot vote in municipal elections. Thus, non-residents did not have a significant role during the hearings. However, once the program began, the Potomac Division of the American Automobile Association (AAA) published articles critical of the enforcement program. The following comment was published in a recent issue of American Motorist*

> It is obvious that whenever the District needs a quick cash flow, the motorist is generally tapped. Most notable was the removal of parking enforcement from the sphere of traffic safety as administered by the Metropolitan Police Department to create a new bureaucratic layer at DOT (at a cost of $5 million). This seemed to us, then and now, to be a parasitical money-making proposition, leeching solely off the motoring public as a certain revenue source.

As can be seen, not everyone has reacted favorably to the program.

After the public hearings, the enforcement program had retained the basic form proposed by D.C. DOT. Two major tasks remained. The first was to promulgate laws and regulations to transfer enforcement and adjudication powers to D.C. DOT. The second task was to transform the proposal to an operating program. The legal authority behind the program is derived from D.C. Law 2-104, District of Columbia Adjudication Act of 1978. This act has two purposes:

- to decriminalize and to provide for the administrative adjudication of parking and minor traffic violations; and
- to provide for the civilian enforcement of parking infractions.

The law became effective on September 12, 1978, after the 30-day U.S. congressional review period.

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* American Motorist, (Winter 1980) p. 6.

Toward the end of 1977, D.C. DOT formed a special task force to oversee the implementation of the new parking enforcement program. The tasks which needed to be done can be classified into one of the following four areas:

- contracts;
- purchases;
- procedures; and
- personnel.

Contracts involved the procurement of services and equipment, such as a towing contractor, vehicles, computer equipment and software, two-way radio equipment, and building renovations. Each procurement involved developing specifications, awarding the contract, and monitoring progress. Purchases involved obtaining items, such as uniforms, boots, and tickets.

Operating procedures for each element of the enforcement program were also developed by the task force. Because civilian enforcement was not in effect in Washington, D.C., procedures were needed for every aspect of operations. The types of procedures needed ranged from the training of enforcement personnel, vehicle release after booting or towing, radio communications, etc.

The major task in the personnel crew was recruiting staff. Other personnel functions which needed to be developed were position descriptions and salary scales.

The enforcement program was originally to be phased in during FY 1979 (October 1978 through September 1979). Ticket writing was to begin in October 1978. Towing was to follow in November, booting in December, and administrative adjudication in January 1981. Delays were experienced due to several factors. The primary factor was that funds for the enforcement program were not available until the beginning of FY 1979. Therefore, various contracts and purchases required for the program could not be made. Delays in transferring from the existing ticket processing system to the new processing system and the extended comment period on the regulations for the administrative adjudication process were additional factors.

Ticket writing authority was granted to the parking control aids (PCAs) by the Mayor on October 19, 1978, and the PCAs began writing tickets on October 23, 1978. Because funds were not available until October 1, 1978, the services of the towing contractor were not available until January 8, 1979. A complete

list of scofflaws was generated and the establishment of the new computerized information system allowed booting to begin on January 29, 1979. The regulations for the Bureau of Adjudication (BTA) became effective on February 20, 1979. Hearings started at that time.

The implementation of the PEP highlighted the importance of the following efforts:

- conversion of the previous parking and minor traffic violation processing system to the new system;
- recruitment of capable personnel;
- development of an information system to support parking enforcement activities; and
- development of a two-way radio network to facilitate communications.

The conversion from the previous processing system to the new system proved to be a difficult task. The new system combined the four areas of driver permit, vehicle registration, traffic enforcement, and traffic adjudication into one comprehensive real-time information system. Software development and the conversion of existing data bases have taken longer than expected. Interaction within the four areas is not always possible and all report generating capabilities are still not totally operational at this time. For a while, lack of this interactive capability resulted in more than one motorist being booted twice in one day for failure to pay the same set of violations. This problem has since been resolved.

4. PARKING ENFORCEMENT PROGRAM OPERATIONS

In order to centralize responsibility for parking throughout the District, the Bureau of Parking and Enforcement (BPE) and the Bureau of Traffic Adjudication (BTA) were formed within the District of Columbia Department of Transportation (D.C. DOT). The role of the BPE is to apply the full range of existing parking management tactics to achieve transportation, energy, and environmental goals, and to generate revenue for the District's General Fund. BPE performs parking studies, manages the parking meter operation, and enforces parking regulations. An organization chart for the BPE is shown in Figure 4-1.

The Parking Enforcement Division of the BPE contains the sections which write the tickets, impound vehicles by towing, and immobilize vehicles by using Denver boots. The authorized manpower (134 positions) for this Division is shown on the organization chart in Figure 4-2. Washington is one of the few cities in the United States that has implemented this integrated approach. All activities connected with parking are brought together in one bureau. This ensures coordinated operations and policies.

The BTA is responsible for processing all parking tickets and minor traffic tickets issued within the District. This bureau has 127 authorized positions.

This chapter discusses the operations of the Ticket Writing, Towing, and Vehicle Immobilization (Booting) Branches of of the Parking Enforcement Division and the BTA. It describes the functions performed, training and equipment, daily operations and resource management of each branch or bureau.

TICKET WRITING BRANCH

The backbone of the Washington, D.C., parking enforcement program (PEP) is the ticket writing branch. Enforcement of parking and other non-moving violations has been the responsibility of this branch since October 23, 1978. Civilian parking control aides (PCAs) perform this function.

Ticket Writing Before PEP

Before the civilian parking enforcement program began, the enforcement of parking laws was the responsibility of the Metropolitan Police Department (MPD). Over 1.5 million tickets were written by the MPD in 1976. This effort represented a sizeable

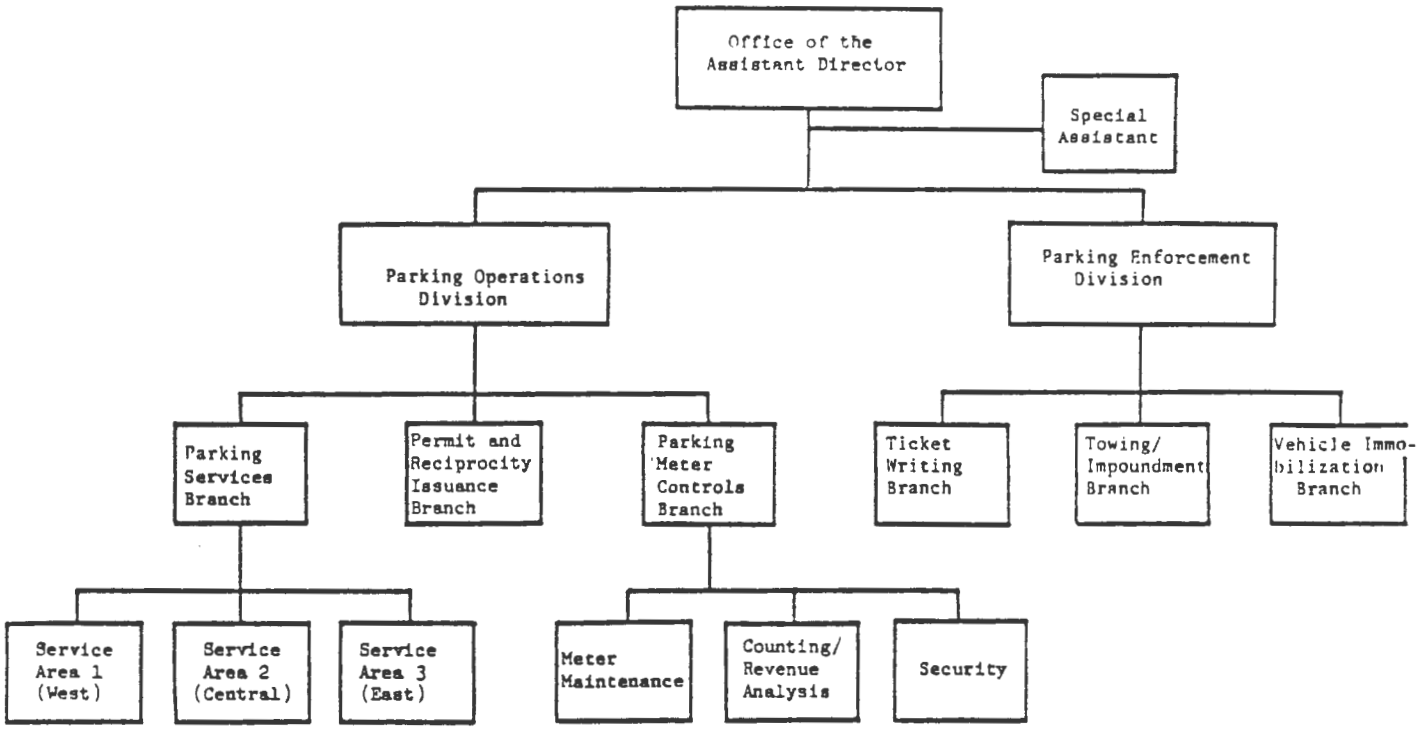


FIGURE 4-1. DISTRICT OF COLUMBIA DEPARTMENT OF TRANSPORTATION BUREAU OF PARKING AND ENFORCEMENT

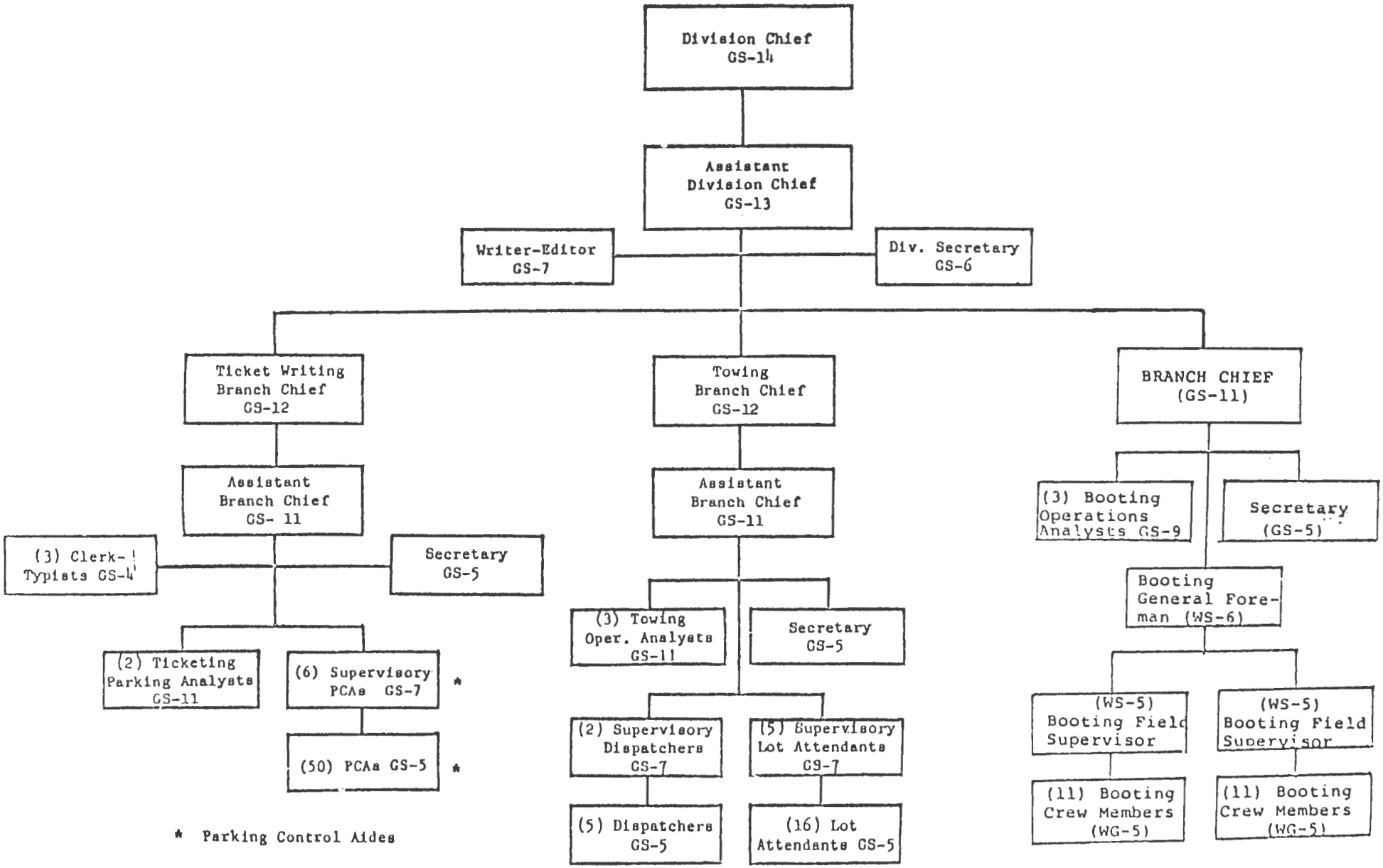


FIGURE 4-2. BUREAU OF PARKING AND ENFORCEMENT, PARKING ENFORCEMENT DIVISION

amount of ticket writing and police time. In fact, this level of enforcement was only achieved through the use of police cadets who wrote almost one-third of the tickets in 1976.

Position Functions

The ticket writing branch is composed of the following personnel positions as shown in Figure 4-2.

- branch chief;
- ticket parking analyst;
- supervisory PCA;
- PCA; and
- clerical support staff.

The branch chief is responsible for directing and coordinating the activities of the branch. His duties include the development and implementation of overall parking enforcement policies in close consultation with the division chief and the other branch chiefs. The two ticket parking analysts are responsible for the examination of ticketing and related data for trends and abnormalities. They use these results to pinpoint areas where more or less enforcement may be required. They also respond to citizen requests and conduct additional studies to improve the effectiveness of the ticket writing effort.

The PCAs are organized into squads of seven to twelve persons. Each squad is led by a supervisory PCA. This person is the first line supervisor for the PCAs. The supervisor's prime responsibility is to implement parking enforcement policies. The supervisor translates these policies into specific daily assignments for each PCA in the squad. Additional duties include:

- ensuring the quality of ticket writing;
- assisting the PCA in dealing with unusual enforcement problems;
- training new PCAs; and
- evaluating PCA performance.

Recently, D.C. DOT has added another supervisory PCA to oversee the existing five supervisory PCAs. This person serves in a

middle management capacity to facilitate the implementation of parking enforcement policies and to better coordinate and control the ticket writing function in the field.

The PCA is the final link in the chain. This civilian enforcement officer is the prime point of contact between the public and the enforcement program. The major responsibility of the PCA is to judiciously enforce parking and non-moving traffic regulations. The PCA is required to identify a non-moving violation and determine if the technical violations, in light of the circumstances, warrant a vehicle citation, removal, or no action. The PCA must make this decision based on his/her interpretation of non-moving traffic regulations, current policy, and prevailing circumstances. The PCA must also consider the relative safety and transportation impact of the violation in making this decision.

Training and Equipment

Training for each PCA includes a two-week course on the purpose of the program, rules of the road, violation structure and departmental policies and procedures. A test is given on this material at the end of the two-week period. This new PCA then spends one week on the street with a more experienced PCA. This field training acquaints the new person with actual conditions on the street. Further, it exposes the new PCA to the type of judgments he/she will have to make in determining whether to issue a citation, remove the vehicle or take no action on a particular violation. The PCA is then on probation for one year.

Each PCA is outfitted with a uniform which distinguishes a PCA from other enforcement personnel in Washington. Two-way hand held radios are provided to allow each PCA to maintain contact with his/her supervisor and the towing dispatcher. Sub-compact cars (Chevettes) are provided to PCAs for mobile patrols. Vans are used to transport PCAs to their foot patrol beat locations.

Daily Operations

In order to cover the morning and afternoon peak travel periods, the PCA squads are run on staggered shifts. The first shift consists of one squad which starts at 6:30 a.m. and finishes at 2:30 p.m. This shift covers the morning peak period and then moves on to the residential neighborhoods. The second shift consists of three squads which work from 10:30 a.m. to 5:30 p.m. This shift concentrates on the central business district (CBD). The final shift begins at 10:30 a.m. and finishes at 6:30 p.m. This shift starts in the residential neighborhoods and then covers the afternoon peak period.

While on patrol, the PCAs search for vehicles in violation of non-moving and parking violations. Each infraction requires the PCA to decide whether to issue a ticket, to have the vehicle towed, or to take no action. Tickets are issued using the form shown in Figure 4-3. The front of the ticket provides space for recording time of the violation, vehicle license plate and description, location of the violation, type of violation, and scheduled fine. The ticket has been designed to maximize the use of check-off boxes. The back of the ticket informs the alleged violator of his/her options in handling the ticket. (A later subsection on administrative adjudication discusses this in more detail.)

If the violation is serious enough to warrant towing the vehicle, the PCA issues a ticket, places a tow sticker on the rear windshield of the vehicle and informs the towing dispatcher of the vehicle's location via radio. The towing dispatcher then sends a tow truck to the reported location. The PCA continues on patrol and is not required to wait until the tow truck arrives.

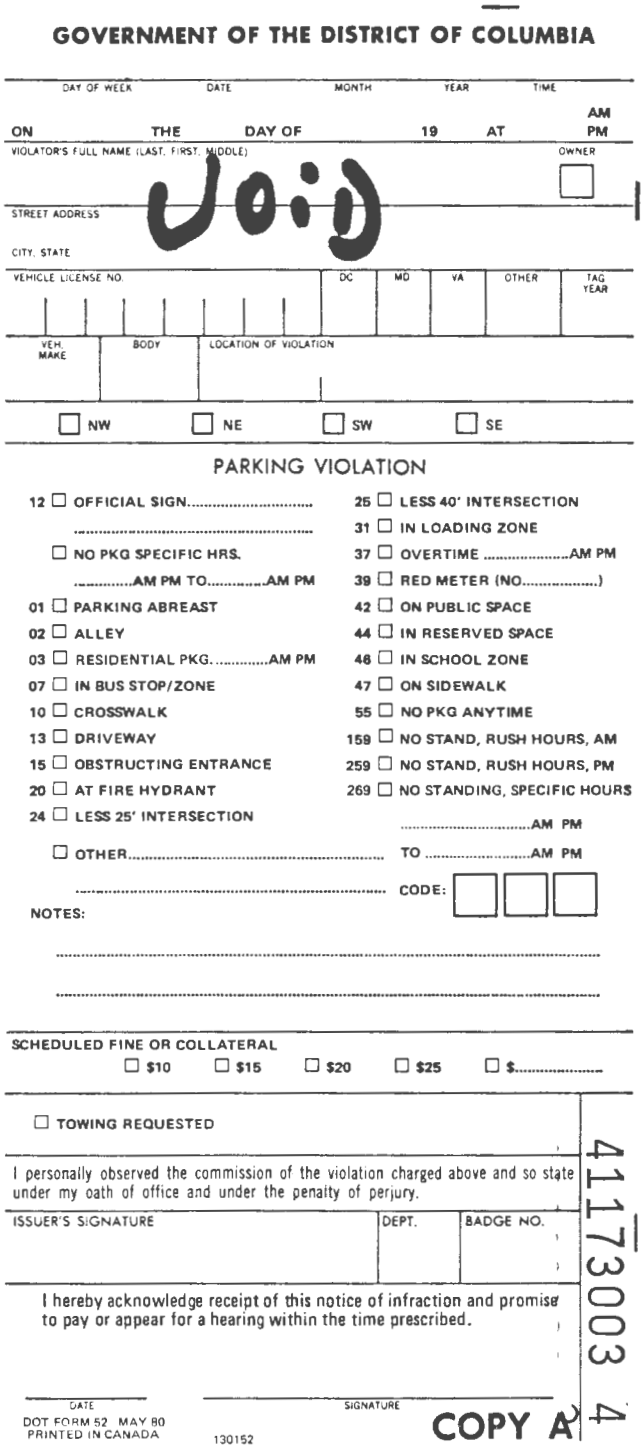
D.C. DOT uses a combination of foot and vehicle patrols to enforce parking regulations. The chosen combination of patrols depends upon the geographic area and the time of day. There are three types of areas: (1) the CBD, (2) neighborhoods, and (3) major arterials. Patrols also vary between peak and non-peak travel periods.

The CBD

The primary purpose of morning peak travel period (7:00 a.m. to 9:30 a.m.) enforcement is to ensure the smooth flow of traffic into the CBD. Enforcement efforts concentrate on ensuring that vehicles do not park on rush hour restricted streets and thus block traffic. Vehicle patrols using personnel from the first shift drive along key downtown arterials looking for violators.

Morning rush hour restrictions end at 9:30 a.m. in the CBD and vehicles are allowed to park at meters and other legal locations. The objectives of parking enforcement broadens to include:

- policing parking meters to ensure the availability of short-term parking;
- ensuring loading zones are only used by commercial vehicles for loading; and
- preventing the blockage of fire hydrants, driveways, alleys, entrances, and bus stops.



GOVERNMENT OF THE DISTRICT OF COLUMBIA

DAY OF WEEK | DATE | MONTH | YEAR | TIME

ON THE DAY OF 19 AT AM PM

VIOLATOR'S FULL NAME (LAST, FIRST, MIDDLE) OWNER ☐

Void

STREET ADDRESS

CITY, STATE

VEHICLE LICENSE NO. | DC | MD | VA | OTHER | TAG YEAR

VEH. MAKE | BODY | LOCATION OF VIOLATION

☐ NW ☐ NE ☐ SW ☐ SE

PARKING VIOLATION

12 ☐ OFFICIAL SIGN.....
.....
☐ NO PKG SPECIFIC HRS.
.....AM PM TO.....AM PM
01 ☐ PARKING ABREAST
02 ☐ ALLEY
03 ☐ RESIDENTIAL PKG.....AM PM
07 ☐ IN BUS STOP/ZONE
10 ☐ CROSSWALK
13 ☐ DRIVEWAY
15 ☐ OBSTRUCTING ENTRANCE
20 ☐ AT FIRE HYDRANT
24 ☐ LESS 25' INTERSECTION
☐ OTHER.....
.....

25 ☐ LESS 40' INTERSECTION
31 ☐ IN LOADING ZONE
37 ☐ OVERTIME .....AM PM
39 ☐ RED METER (NO.....)
42 ☐ ON PUBLIC SPACE
44 ☐ IN RESERVED SPACE
46 ☐ IN SCHOOL ZONE
47 ☐ ON SIDEWALK
55 ☐ NO PKG ANYTIME
159 ☐ NO STAND, RUSH HOURS, AM
259 ☐ NO STAND, RUSH HOURS, PM
269 ☐ NO STANDING, SPECIFIC HOURS
.....AM PM
TO .....AM PM
CODE: ☐☐☐

NOTES:

.....

.....

SCHEDULED FINE OR COLLATERAL
☐ $10 ☐ $15 ☐ $20 ☐ $25 ☐ $.....

☐ TOWING REQUESTED

I personally observed the commission of the violation charged above and so state under my oath of office and under the penalty of perjury.

ISSUER'S SIGNATURE | DEPT. | BADGE NO.

I hereby acknowledge receipt of this notice of infraction and promise to pay or appear for a hearing within the time prescribed.

DATE SIGNATURE

DOT FORM 52 MAY 80
PRINTED IN CANADA 130152

COPY A

4117300 3 4

FIGURE 4-3. SAMPLE PARKING TICKET

To meet this increased need for enforcement, three squads of PCAs from the second shift are on foot patrol by no later than 10:00 a.m.

Each PCA is generally assigned one of the beats in the CBD to patrol. Each beat consists of approximately a three-block by three-block area. The beats were designed to be covered in 30 to 60 minutes. The PCAs are rotated among the various beats to preserve their integrity. Each squad works one area for six to eight weeks. A PCA might work up to ten different beats during this period.

The foot patrols are supplemented at midday (11:00 a.m.to 1:00 p.m.) by vehicle patrols. Three PCAs in D.C. DOT vehicles monitor key streets to ensure the flow of traffic during lunch hour.

The afternoon peak travel period parking restrictions begin at 4:00 p.m. and continue until 6:30 p.m. Because of the large number of vehicles in the CBD at the beginning of the evening rush hour, the need to ensure smooth traffic flow is even greater than during the morning peak. The foot patrols which provide non-peak coverage are still on duty in the CBD until 5:15 p.m. This extra coverage at the beginning of the peak period is generally enough to clear the rush period restricted streets of parked vehicles. Vehicle patrols from the one squad's third shift cover the remainder of the evening rush period.

Residential Neighborhoods

Washington, D.C., has a large residential parking permit program. Over 1,600 blocks are limit parking for non-permit holders to two hours. The vehicle patrols of the first and third shift are used to enforce this program. Because of the large number of areas to be covered, each area is not patrolled every day.

Because the violation is time related, the patrol procedure is different from the procedure employed in the CBD. The PCA drives along a block and records the vehicle license tag and time of observation for each vehicle. The PCA then returns in two hours to see if the non-permit vehicles are still parked in the restricted zone.

Major Arterials

Several major arterials serve as prime routes into and out of the CBD during the peak period. The restriction of parking in the curb lane provides additional capacity to facilitate traffic flow.

Enforcement of this restriction is accomplished in an operation referred to as a sweep. A sweep team consists of one PCA in a vehicle and two to three tow trucks. The PCA drives along a major arterial looking for vehicles in violation of the restriction. The tow trucks follow behind the PCA. When a violator is found, the PCA writes a ticket and one of the tow trucks removes the vehicle. The PCA continues along the arterial until the next violation is found. Then the next tow truck in line removes this violator. Additional tow trucks are requested as required.

Resource Management

The success of the PEP depends on how well available resources are managed. There are two aspects to this issue: the first is the selection of good personnel, and the second is the effective use of these personnel.

The PCA is the prime point of contact between the public and the enforcement program. D.C. DOT seeks personnel with specific characteristics to fill this position. The PCA must be able to understand the sometimes complex nature of violations and the prevailing circumstances. An even-tempered person with the ambition to get the job done is sought. The selected person should be able to follow instructions but not be overqualified in terms of formal education. The PCA should be between 20 to 45 years of age to handle the physical strain of the job. D.C. DOT has been successful in hiring married women over 30 years of age who are interested in bringing a second income into the family.

The philosophy of D.C. DOT parking enforcement officials is to place most of the responsibility for daily operations on the supervisory PCAs and PCAs. However, overall enforcement policy and special enforcement efforts are determined at higher management levels. The supervisory PCAs monitor the productivity and quality of the PCAs in their squad daily. After two years of operations, the supervisors know approximately how many tickets a particular beat should produce in a day. Thus, their first flag is a drop in the number of tickets for a particular beat. The PCA on that particular beat may be asked if conditions have changed on the beat or the supervisor may work the beat to look for these changes. If the problem is with the PCA and not the beat, corrective actions are taken. If conditions on the beat have changed, beat assignments are altered to maintain productivity.

Factors that are considered in the allocation of resources include:

- land use (commercial, offices, school, government, etc.);
- traffic conditions;
- time of day or year;
- citizen complaints;
- meter revenues;
- ticket productivity; and
- current enforcement policy.

Areas with shops and stores are patrolled heavily to ensure higher metered space turnover and clear loading zones. Major through streets are watched to maintain traffic flow, especially during peak travel periods. Enforcement around university campuses is more intensive during the start of each term and is reduced greatly between terms. Citizen and business complaints are used to pinpoint specific problems. The falling off of expected meter revenues is a signal for additional enforcement. All of these efforts are tempered by current policy.

Finally, perceived needs are balanced against available resources. For the most part, resource allocation is accomplished in a subjective manner rather than through analytical techniques. This subjective feel for the location where resources are needed only comes from experience and through trial and error. Analytical approaches may provide more objective justifications for decisions but may not result in better allocations.

VEHICLE IMMOBILIZATION (BOOTING) BRANCH

The "bite" behind the ticketing in the D.C. PEP program is the boot. Vehicles with two or more outstanding parking violations are considered scofflaws and subject to immobilization with Denver boots. D.C. DOT policy is to immobilize vehicles with four or more outstanding parking violations. Vehicles with more than $200 in outstanding fines are towed rather than booted. Since vehicles licensed in D.C. must pay all outstanding fines at vehicle registration time, generally only non-D.C. registered vehicles are booted. The primary responsibility of the booting branch is to immobilize scofflaws so they will be forced to pay their outstanding parking violations.

Booting Before PEP

Prior to the PEP in D.C., booting was the responsibility of the Special Operations Division (SOD) of the Metropolitan Police Department (MPD). The SOD is responsible for crowd control, dignitary protection, and other special assignments. Booting, like other parking enforcement measures, was a low priority among the many duties of the SOD. Because of the high number of scofflaws, estimated at 90,000 in 1977, PEP proposed a civilian force of booters that would devote their entire effort to booting vehicles. The PEP booting program began January 20, 1979. The MPD's SOD continues to boot vehicles when it can. The following sections describe PEP's booting program as implemented.

Position Functions

The booting branch is composed of the following personnel as shown earlier in Figure 4-2:

- branch chief;
- booting operations analysts;
- booting general foreman;
- booting field supervisor; and
- booting crew members.

The branch chief is responsible for directing and coordinating the activities of the branch. His duties include development and implementation of booting policies and production standards. The two booting operations analysts review and analyze the booting data to assess the efficiency and effectiveness of the procedures used by the booting crews. Analysts identify areas where scofflaws repeatedly violate parking regulations so that appropriate assignments may be given to the booting crews. Additionally, the analysts respond to citizens' complaints and comments about the booting program.

The booting general foreman supervises the booting crews and explains policies and priorities for booting crews. He/she continuously monitors and evaluates field performance of booters and booting field supervisors. Additionally, the foreman oversees and reviews all aspects of the identification, immobilization, and release of vehicles by D.C. DOT.

The booting field supervisor assigns, advises and coordinates the work of the booting crews. The supervisor also trains the crew members, takes responsibility for repairing or replacing broken equipment, and assists the booting general foreman to determine ways to improve job output, and increase general operating efficiency.

Booting crew members, like PCAs in ticketing, are the main point of contact between the public and the booting branch of the PEP. Booters who are civilian enforcement officers work in two-person teams to identify and immobilize vehicles with unpaid warrants for multiple parking violations. Additionally, booters release D.C. DOT booted vehicles when they receive authorization from communications operators* and perform minor maintenance on booting units (e.g., periodic painting, arm straightening).

Training and Equipment

Training for booting personnel is done on the job. Booters are trained in attaching and releasing the booting device to the vehicle. Analyst training also takes place on the job.

The equipment used by the booting branch includes two-way radios, vans, and boots. The two-way radios are used by the booters to contact the communications center for verification on a boot request and are the same as those used by the PCAs. The 11 vans are used by the booters to cruise their area and carry the boots.

The 400 boots D.C. uses are OMNICRON wheel locks. They consist of two basic components: "(1) a vise clamp which encircles the tire radially, gripping the rim flanges with firm metal-to-metal contact and (2) a locking arm/hubcover which conceals the clamp locking nut and the lug nuts."** The boots weigh approximately 30 pounds and can be installed in a few minutes.

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* All vehicles booted by MPD Special Operations Division must be released by MPD SOD.

** IMPOUNDED! OMNICRON brochure.

Daily Operations

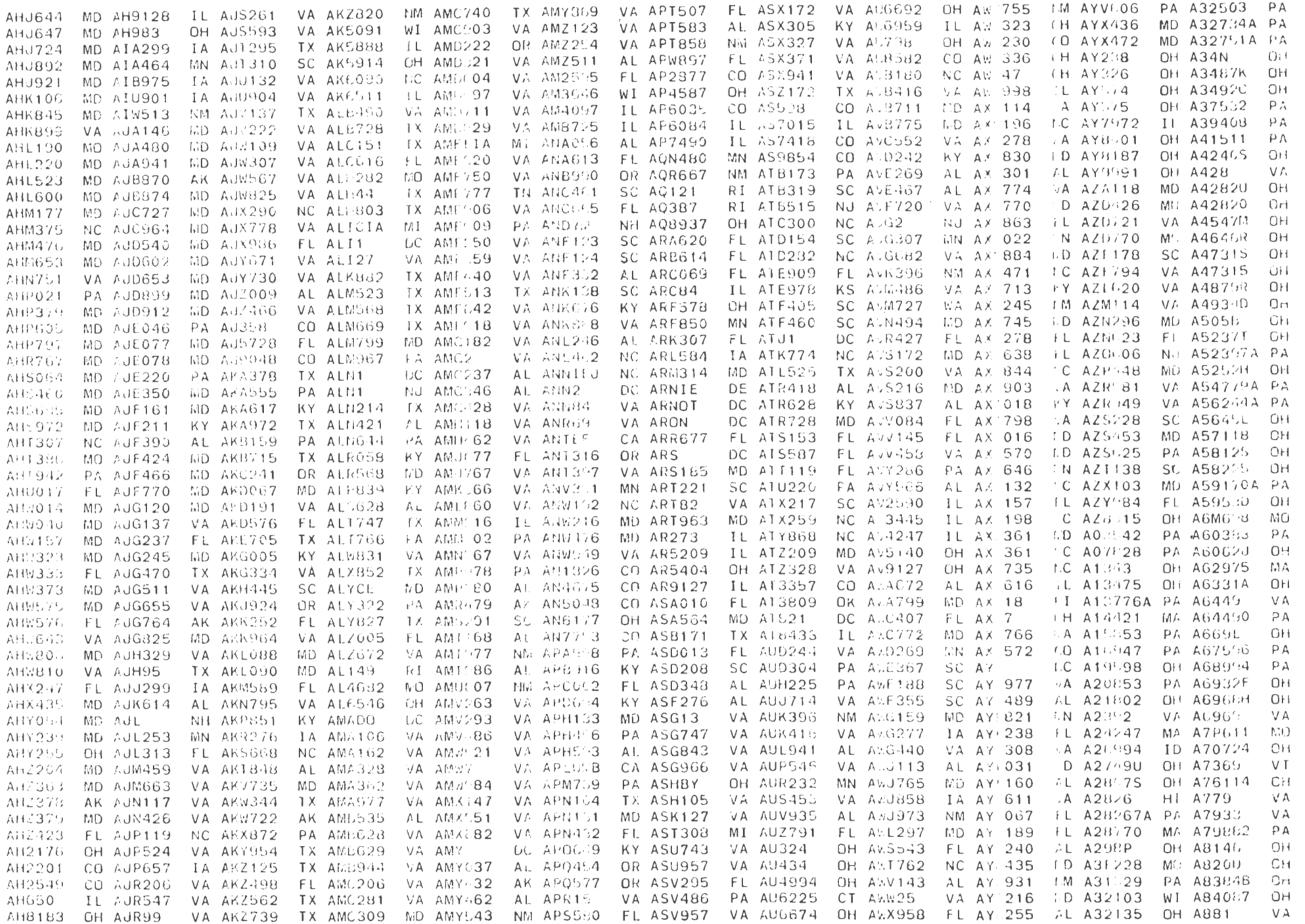
Booters are assigned to general areas in the city instead of specific beats like the PCAs. Booters must use their judgment and discretion in determining how much time and effort to devote to the various sub-areas within their area. Most booters are assigned downtown. Since there are more violations there and the average ticket value for the downtown violator/scofflaw is higher, this is a cost-effective procedure.

The nine two-person booting teams travel through their assigned areas looking for scofflaws. The crew is given a computer list of license tag numbers of scofflaws similar to the one shown in Figure 4-4. Additionally, the crew may be provided with information such as the location of vehicles owned by the scofflaws who have the most tickets/highest fines.

When a member of the team finds a vehicle from the scofflaw list he/she radios the communications center at D.C. DOT for verification. The radio operator at the communications center fills out a boot request card (shown in Figure 4-5) and punches the time-clock with the request time. A second person at the communications center verifies that the vehicle is on the scofflaw list. This verification time is then punched on the form. If the vehicle is on the list, the boot is then mounted on the vehicle. The booter fills out the first part of the multicopy immobilization notice and affixes the original face down on the windshield. Additionally, the booter makes an entry on the daily vehicle immobilization log, which includes the make of vehicle, color, state of registration, tag number, boot request verification times, and booting device number. A daily vehicle immobilization log form is shown in Figure 4-6.

Once the vehicle is booted the booting team continues covering their area looking for scofflaws. The communications center enters the information from the booting card onto the computer. A second person verifies the data entry.

When a booted vehicle owner pays his/her fines or has tickets adjudicated (see adjudication subsection), the cashier notifies the booting branch to release the vehicle. The time is punched on the booting card. The radio operator notifies the booting crew to remove the boot from the vehicle. Vehicles that have not had their boots removed after five days are towed to an impoundment lot and the boot is returned to the booting branch. Vehicles booted in rush hour tow-away zones are also subject to towing if the owner does not have the boot removed and move the vehicle out of the tow-away zone. Vehicles will be towed, not booted, if the fines are in excess of $200.



AHJ644 MD AH9128 IL AJS261 VA AKZ820 NM AMC740 TX AMY369 VA APT507 FL ASX172 VA AU6692 OH AW 755 NM AYV606 PA A32503 PA
AHJ647 MD AH983 OH AJS593 VA AK5091 WI AMC903 VA AMZ123 VA APT583 AL ASX305 KY AU6959 IL AW 323 CH AYX436 MD A32734A PA
AHJ724 MD AIA299 IA AJT295 TX AK5888 IL AMD222 OR AMZ254 VA APT858 NM ASX327 VA AU738 OH AW 230 CO AYX472 MD A32751A PA
AHJ892 MD AIA464 MN AJT310 SC AK5914 OH AMD321 VA AMZ511 AL APW897 FL ASX371 VA AUB582 CO AW 336 CH AY238 OH A34N OH
AHJ921 MD AIB975 IA AJU132 VA AK6095 NC AMD604 VA AM2565 FL AP2377 CO ASX941 VA AUB180 NC AW 47 CH AY326 OH A3487K OH
AHK106 MD AIU901 IA AJU904 VA AK6511 IL AMD707 VA AM3646 WI AP4587 OH ASZ173 TX AUB416 VA AW 998 IL AY574 OH A3492C OH
AHK845 MD AIW513 NM AJV137 TX AL6490 VA AMD711 VA AM4097 IL AP6035 CO AS538 CO AW8711 MD AX 114 A AY575 OH A37532 PA
AHK899 VA AJA146 MD AJV222 VA AL6728 TX AMD729 VA AM8725 IL AP6084 IL AS7015 IL AW8775 MD AX 196 NC AY7972 IL A39408 PA
AHL190 MD AJA480 MD AJW109 VA ALC151 TX AMELIA MI ANA056 AL AP7490 IL AS7416 CO AXC552 VA AX 278 GA AY8401 OH A41511 PA
AHL220 MD AJA941 MD AJW307 VA ALC616 FL AME220 VA ANA613 FL AQN480 MN AS9854 CO AXD242 KY AX 830 ID AY8187 OH A42465 OH
AHL523 MD AJB870 AK AJW567 VA ALE282 MO AME750 VA ANB990 OR AQR667 NM ATB173 PA AXE269 AL AX 301 AL AY9691 OH A428 VA
AHL600 MD AJB874 MD AJW825 VA ALH44 TX AMF777 TN ANC461 SC AQ121 RI ATB319 SC AXE467 AL AX 774 VA AZA118 MD A4282U OH
AHM177 MD AJC727 MD AJX290 NC ALH803 TX AMF906 VA ANC965 FL AQ387 RI ATB515 NJ AXF720 VA AX 770 D AZD626 MD A42820 OH
AHM375 NC AJC964 MD AJX778 VA ALICIA MI AMF909 PA AND7 NH AQ8937 OH ATC300 NC AXG2 NJ AX 863 IL AZD721 VA A4547M OH
AHM476 MD AJD540 MD AJX986 FL ALI1 DC AMF950 VA ANF103 SC ARA620 FL ATD154 SC AXG307 MN AX 022 N AZD770 MI A4646R OH
AHM653 MD AJD602 MD AJY671 VA ALI27 VA AMF959 VA ANF124 SC ARB614 FL ATD282 NC AXG682 VA AX 884 ID AZE178 SC A4731S OH
AHN751 VA AJD653 MD AJY730 VA ALK882 TX AMF940 VA ANF362 AL ARC069 FL ATE909 FL AXK396 NM AX 471 NC AZE794 VA A47315 OH
AHP021 PA AJD899 MD AJZ009 AL ALM523 TX AMF913 TX ANK138 SC ARC84 IL ATE978 KS AXM486 VA AX 713 KY AZE820 VA A4879R OH
AHP379 MD AJD912 MD AJZ466 VA ALM568 TX AMF942 VA ANK676 KY ARF578 OH ATF405 SC AXM727 WA AX 245 TM AZM114 VA A4934D OH
AHP635 MD AJE046 PA AJ358 CO ALM669 TX AMF918 VA ANK828 VA ARF850 MN ATF460 SC AXN494 MD AX 745 ID AZN296 MD A5056 OH
AHP797 MD AJE077 MD AJ5728 FL ALM799 MD AMG182 VA ANL246 AL ARK307 FL ATJ1 DC AXR427 FL AX 278 FL AZN623 FL A5237T OH
AHR767 MD AJE078 MD AJ9048 CO ALM967 PA AMG2 VA ANL442 NC ARL584 IA ATK774 NC AXS172 MD AX 638 FL AZO606 NJ A52397A PA
AHS064 MD AJE220 PA AKA378 TX ALN1 DC AMG237 AL ANNIE NC ARM314 MD ATL525 TX AXS200 VA AX 844 IC AZP548 MD A5252H OH
AHS4E0 MD AJE350 MD AKA555 PA ALN1 NJ AMG546 AL ANN2 DC ARNIE DE ATR418 AL AXS216 MD AX 903 GA AZR781 VA A54779A PA
AHS6 MD AJF161 MD AKA617 KY ALN214 TX AMG628 VA ANN84 VA ARNOT DC ATR628 KY AXS837 AL AX 018 KY AZR949 VA A56264A PA
AHS972 MD AJF211 KY AKA972 TX ALN421 AL AMH118 VA ANR69 VA ARON DC ATR728 MD AXV084 FL AX 798 GA AZS228 SC A5645L OH
AHT307 NC AJF393 AL AKB159 PA ALN644 PA AMH262 VA ANTES CA ARR677 FL ATS153 FL AXV145 FL AX 016 ID AZS453 MD A57118 OH
AHT396 MD AJF424 MD AKB715 TX ALR658 KY AMJ077 FL ANT316 OR ARS DC ATS587 FL AXV458 VA AX 570 ID AZS625 PA A58125 OH
AHT942 PA AJF466 MD AKC241 OR ALR668 MD AMJ767 VA ANT367 VA ARS185 MD ATT119 FL AXY286 PA AX 646 IN AZT138 SC A58235 OH
AHU017 FL AJF770 MD AKD067 MD ATF839 KY AMK266 VA ANV311 MN ART221 SC ATU220 PA AXY565 AL AX 132 IC AZX103 MD A59170A PA
AHW014 MD AJG120 MD AKD191 VA AL7628 AL AML260 VA ANW102 NC ART82 VA ATX217 SC AY2590 IL AX 157 FL AZY784 FL A5953D OH
AHW040 MD AJG137 VA AKD576 FL AL7747 TX AMM216 IL ANW216 MD ART963 MD ATX259 NC AY3445 IL AX 198 C AZ6315 OH A6M678 MO
AHW157 MD AJG237 FL AKE705 TX AL7766 PA AMN102 PA ANW476 MD AR273 IL ATY868 NC AY4247 IL AX 361 ID AO4542 PA A60385 PA
AHW323 MD AJG245 MD AKG005 KY ALM831 VA AMN767 VA ANW549 VA AR5209 IL ATZ209 MD AY5140 OH AX 361 IC AO7F28 PA A6062U OH
AHW336 FL AJG470 TX AKG334 VA ALX852 TX AMP478 PA AN1326 CO AR5404 OH ATZ328 VA AY9127 OH AX 735 NC A1363 OH A62975 MA
AHW373 MD AJG511 VA AKH445 SC ALYCE MD AMP780 AL AN4675 CO AR9127 IL AT3357 CO AXC72 AL AX 616 FL A13675 OH A6331A OH
AHW575 MD AJG655 VA AKJ924 OR ALY392 PA AMR479 AZ AN5048 CO ASA010 FL AT3809 OK AXA799 MD AX 18 HI A13776A PA A6449 VA
AHW576 FL AJG764 AK AKK252 FL ALY827 TX AMS201 SC AN6177 OH ASA564 MD AT521 DC AXC407 FL AX 7 IH A14421 MA A64490 PA
AHX643 VA AJG825 MD AKK964 VA ALZ005 FL AMT168 AL AN7713 CO ASB171 TX AT8435 IL AXC772 MD AX 766 GA A15853 PA A669L OH
AHW805 MD AJH329 VA AKL088 MD ALZ672 VA AMT777 NM APA998 PA ASD013 FL AUD244 VA AXD269 NM AX 572 CO A16947 PA A67596 PA
AHW810 VA AJH95 TX AKL090 MD AL149 RI AMT786 AL APB916 KY ASD208 SC AUD304 PA AXE367 SC AY LC A19F98 OH A68994 PA
AHX247 FL AJJ299 IA AKM569 FL AL4682 MO AMU607 NM APC062 FL ASD348 AL AUH225 PA AXF188 SC AY 977 VA A20853 PA A6932F OH
AHX435 MD AJK614 AL AKN795 VA AL6546 OH AMV863 VA APD664 KY ASF276 AL AUJ714 VA AXF355 SC AY 489 AL A21802 OH A6968H OH
AHY054 MD AJL NH AKP851 KY AMADO DC AMV893 VA APH133 MD ASG13 VA AUK396 NM AXG159 MD AY 821 GN A2392 VA A6967 VA
AHY239 MD AJL253 MN AKR276 IA AMA106 VA AMV986 VA APH476 PA ASG747 VA AUK416 VA AXG277 IA AY 238 FL A24247 MA A7P611 MO
AHY255 OH AJL313 FL AKS668 NC AMA162 VA AMW21 VA APH593 AL ASG843 VA AUL941 AL AXG440 VA AY 308 VA A24994 ID A70724 OH
AHZ264 MD AJM459 VA AKT848 AL AMA328 VA AMW7 VA APL058 CA ASG966 VA AUP546 VA AXG113 AL AY 031 D A2769U OH A7369 VT
AHZ363 MD AJM663 VA AKV735 MD AMA362 VA AMW84 VA APM759 PA ASH8Y OH AUR232 MN AWJ765 MD AY 160 AL A28675 OH A76114 CH
AHZ378 AK AJN117 VA AKW344 TX AMA977 VA AMX147 VA APN164 TX ASH105 VA AUS455 VA AWJ858 IA AY 611 GA A2826 HI A779 VA
AHZ379 MD AJN426 VA AKW722 AK AMD535 AL AMX751 VA APN191 MD ASK127 VA AUV935 AL AWJ973 NM AY 067 FL A28267A PA A7933 VA
AHZ423 FL AJP119 NC AKX872 PA AMD628 VA AMX882 VA APN432 FL AST308 MI AUZ791 FL AXL297 MD AY 189 FL A28770 MA A79862 PA
AH2176 OH AJP524 VA AKY954 TX AMD629 VA AMY DC APO649 KY ASU743 VA AU324 OH AXS543 FL AY 240 AL A298P OH A8146 OH
AH2201 CO AJP657 IA AKZ125 TX AMD944 VA AMY637 AL APQ454 OR ASU957 VA AU434 OH AXT762 NC AY 435 ID A3F228 MO A8200 OH
AH2549 CO AJR206 VA AKZ498 FL AMC206 VA AMY732 AK APQ577 OR ASV295 FL AU4994 OH AXV143 AL AY 931 TM A3F29 PA A83846 OH
AH650 IL AJR547 VA AKZ562 TX AMC281 VA AMY962 AL APR15 VA ASV486 PA AU6225 CT AXW25 VA AY 216 ID A32103 WI A84067 OH
AH8183 OH AJR99 VA AKZ739 TX AMC309 MD AMY943 NM APS580 FL ASV957 VA AU6674 OH AXX958 FL AY 255 AL A32135 OH A881 VA

FIGURE 4-4. SAMPLE SCOFFLAW LIST

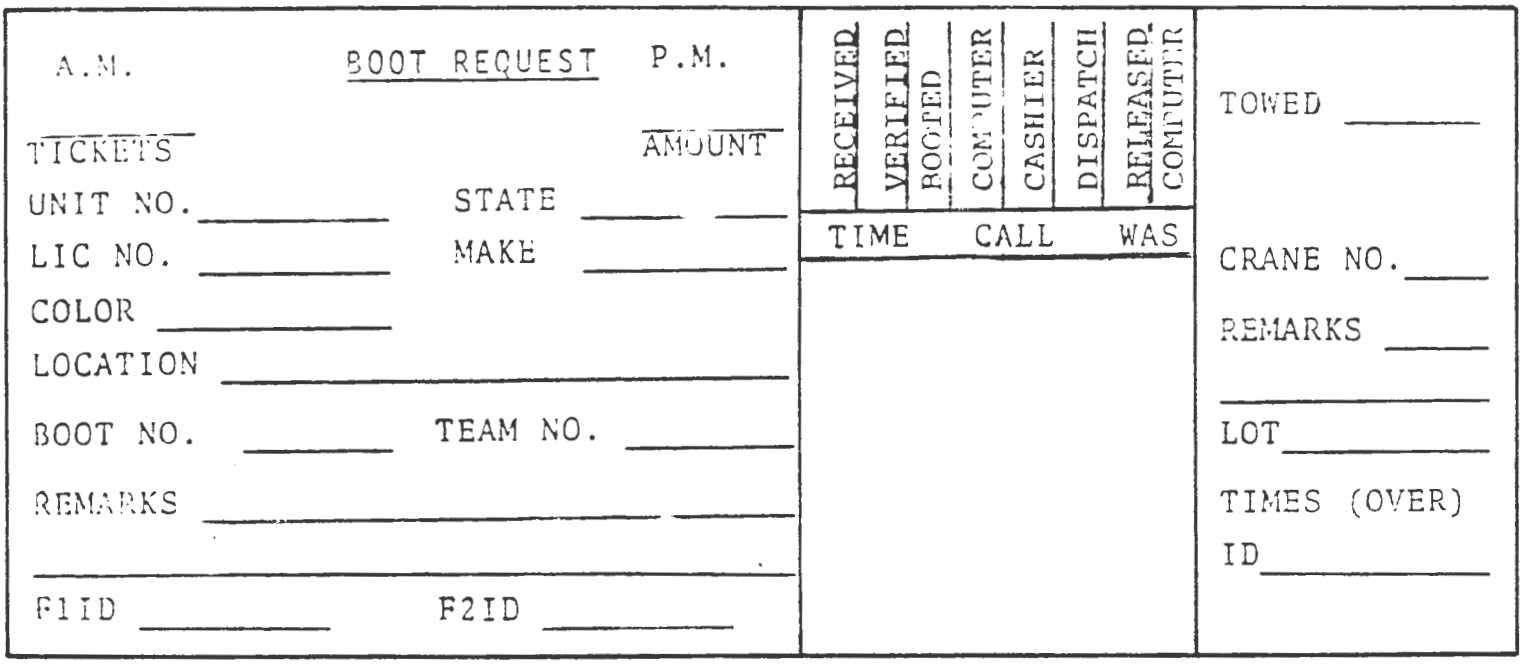


FIGURE 4-5. BOOT REQUEST CARD

DATE _____

NAMES _____ / _____ VAN NO. _____ WEATHER _____ BADGE NO.s _____ / _____

MILEAGE ON VAN AT BEGINNING OF DAY: _____ MILEAGE ON VAN AT END OF DAY: _____

DEVICE NUMBERS ON VAN AT BEGINNING OF DAY:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

TAG NO.	STATE	MAKE	COLOR	VEHICLE LOCATION	VERIFICATION: TIME REQUESTED	TIME RECEIVED-POS./NEG.	TIME DEVICE INSTALLED	TIME DEVICE REMOVED	DEVICE NO.	TOWED-CRANE NO.

DEVICE NUMBERS ON VAN AT END OF DAY:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

80-D2298

FIGURE 4-6. DAILY VEHICLE IMMOBILIZATION LOG

During the day booting crews are assigned for booting and releasing vehicles. In the early evening booting crews are assigned to release duty only.

Resource Management

With over 90,000 vehicles on the scofflaw list, some effort is made to concentrate boot patrols in areas where the most scofflaws will be found. These areas generally correspond to the highest ticket incidence. On occasion, a "heavy hitter" list of violations with more than 10 tickets is generated and this list is used by the patrols to catch flagrant violators. The patrols are sometimes concentrated in some of the non-CBD commercial and office areas where there is a greater temptation to use on-street parking as long-term parking. Because many violators in these areas are repeaters, booting provides a strong disincentive to further violations.

In July 1980, D.C. DOT set production standards for its booting crews. Each crew is expected to complete three transactions per hour in any combination of placing or releasing boots. With the crews booting for 6.5 hours per day, a total of 19.5 transactions per team per day are performed. For the nine teams, this will result in a total of 175.5 transactions per day. Productivity has risen since these standards were set.

TOWING BRANCH

Towing, like ticketing and booting is an integral part of D.C.'s PEP program. Although a contractor actually tows the vehicles, the towing branch has many responsibilities, including operation of the communications center, maintenance of computer records of impounded and booted vehicles, operation of the impoundment lots, and management of the contract towing services. Additionally, the towing branch, in conjunction with the MPD, arranges and conducts auctions of vehicles that are not reclaimed by their owners.

Towing Before PEP

Prior to the PEP, towing was used primarily to clear traffic lanes during the rush hour. Illegally parked vehicles were relocated to side streets by the MPD or private contractors at no cost to the vehicle owner. Drivers who could not locate their vehicles could call the police to find their cars. A small percentage of vehicles was towed either for having an extraordinary number of outstanding tickets or for having been booted for more than two days. PEP proposed to eliminate this cost-ineffective way of handling illegal parkers by implementing a towing program

operated by civilians and charging a $50 fee for towed vehicles. The PEP towing program began January 9, 1979.

Position Descriptions

The towing branch is composed of the following personnel, shown earlier in Figure 4-2:

- branch chief;
- assistant branch chief;
- towing operations analysts;
- supervisory dispatchers;
- dispatchers;
- supervisory lot attendants; and
- lot attendants.

The branch chief is responsible for directing and coordinating the activities of the branch and the towing contractor. His duties include development and implementation of towing policies and monitoring of towing contractor. The assistant branch chief serves as a full assistant to the chief and performs a variety of administrative and management tasks. Most of the assistant branch chief's time is spent in the field supervising and evaluating branch personnel. Towing branch analysts review and analyze data to assess the efficiency and effectiveness of the towing operation. They monitor the towing contractor's operation to insure the contractor's compliance with the contract. Analysts estimate the possible number of tows in the different areas of the city and prepare policy for prioritizing of tows during rush hour.

The supervisory dispatchers control the dispatching of contractor-operated tow trucks and monitor all towing operations. They respond to requests for information from PCAs, booters, MPD, and other authorized persons. The supervisory dispatchers are also responsible for assigning a priority for each tow requested. Towing dispatchers are responsible for the operation of the control desk. They receive request for towing and booting verification and handle the recording of data for computer entry. Dispatchers need a good knowledge of the city, since they determine which towing station should dispatch trucks to a requested tow.

The supervisory lot attendants direct the operation of the impoundment lots. This involves insuring that the proper paperwork is completed for the entry and release of vehicles. The supervisory lot attendants are responsible for a work force of seven lot attendants. They plan and make work assignments and do performance evaluations for the lot attendants. The lot attendants receive, store, and release the vehicles brought to the impoundment lots, as well prepare the necessary paperwork documenting the transactions.

Training and Equipment

Dispatchers and impoundment lot attendants receive on-the-job training from their supervisor and by observing their co-workers. Training for the analysts is also done on the job. Most analysts have either considerable experience in enforcement, or a college education, or both.

The equipment used by the towing branch includes radios, and data entry facilities. The communications center operates two frequencies: one frequency is for PCAs and booters and the other is primarily for dispatching tow trucks. A few PCAs have radios with two frequencies and will use them both. The data processing equipment consists primarily of video display terminals which are used to enter information from the boot and tow cards and to verify boot requests. The equipment used for towing the vehicles, i.e., trucks, cranes, etc., is the responsibility of the towing contractor. In preparing the towing contract, D.C. DOT required the contractor to provide cradle crane tow trucks. Cradle crane tow trucks enable cars to be towed by the wheels, which creates less damage than towing by the axle. Cradle crane tow trucks also make it possible to tow vehicles that are parked between two other vehicles.

Daily Operations

Vehicles may be towed for any of the following reasons:

- Illegally parked, creating traffic or safety hazards;
- Unpaid tickets totaling $200 or more; and
- Unclaimed five days after being booted.

Illegal parking offenses that are towable include blocking driveways or entrances, parking too close to intersections or fire hydrants, and parking in restricted areas during rush hour. Those vehicles illegally parked are towed either at the request

of authorized personnel or in sweeps as described earlier. A majority of the tows are in response to specific requests by PCAs. The procedure is outlined below.

Towing Procedures

A PCA or other authorized person will call the communications center to request a tow truck after writing a ticket and placing a tow sticker on the rear windshield of the vehicle. A reproduction of the tow sticker is shown in Figure 4-7.

The dispatcher at the control desk of the communications center responds to the call by filling out a tow request card (shown as Figure 4-8). The vehicle license number, the state of registration, the vehicle make and the location are entered on the card by a dispatcher. This card is then punched with the time that the tow was requested.

The form is given to a towing dispatcher who selects an available tow truck in the area. A dispatcher radios the information on the tow request card to the tow truck and has the time that the tow truck is dispatched punched on the card.

The tow truck driver fills out a towing and impoundment form with information received from the dispatcher. Figure 4-9 is a copy of this form. In addition, the driver records: (1) the time of dispatch, (2) the time of arrival at the illegally parked vehicle, (3) the time leaving the site, and (4) the time of arrival at the impoundment lot.

When the tow truck arrives at the correct location, the driver checks the information, hooks up the vehicle, and reports in to the towing dispatcher. The dispatcher punches the time the call was received on the towing card. At this stage in the process two other possible situations may occur. When the tow truck arrives at the location, the vehicle may be gone. Or while the driver is in the process of hooking the crane up to the vehicle, the owner may return. If the vehicle is gone, the tow truck driver calls the towing dispatcher to tell him/her to place the tow card in the GOA (gone on arrival) category. In the instance where the owner returns to the vehicle while it is in the process of being towed, the tow truck operator returns the vehicle to the owner and relays the information to the towing dispatcher. Data from the tow cards are entered into the computer at the communications center and verified.

When the tow truck driver completes the hook-up process and tows a vehicle to an impoundment lot, the lot attendant checks the information on the towing and impoundment form. The attendant

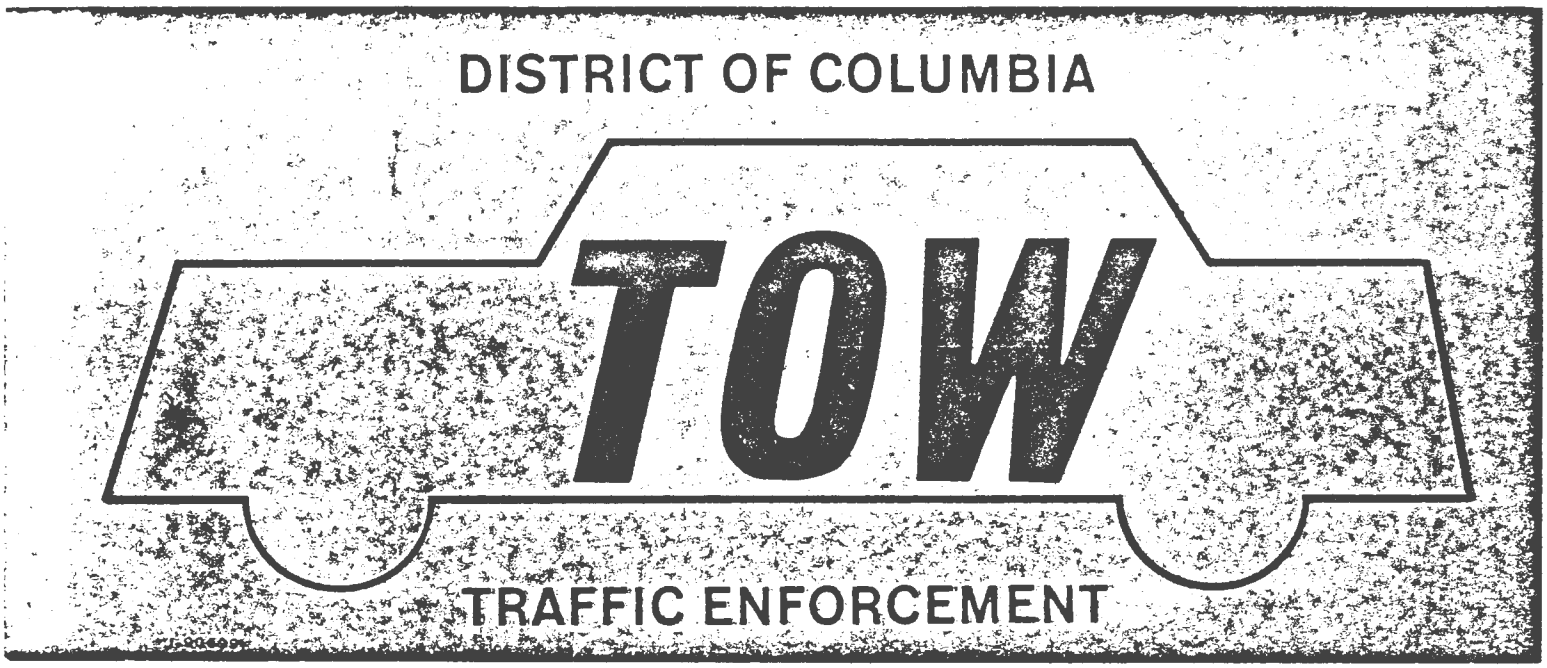


FIGURE 4-7. TOW STICKER

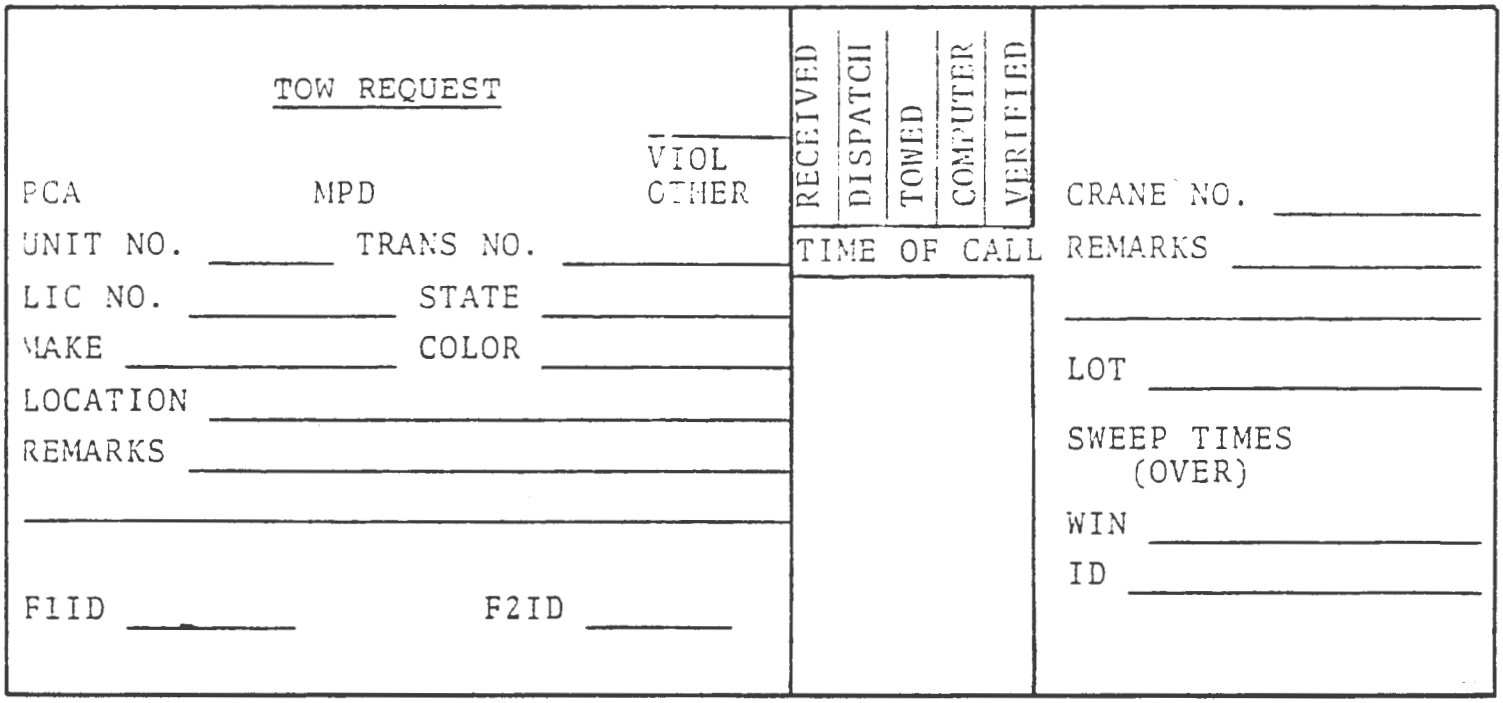


FIGURE 4-8. TOW REQUEST CARD

R30099

Associated Printers, Inc.
BALTIMORE, MARYLAND 21207

TRANS. NO. MAKE LIC. NO. STATE

COLOR LOCATION

LOT NO. SPACE NO. TIME 1.

REMARKS 2.

3.

4.

VEHICLE DESCRIPTION (INDICATE DAMAGED AREA BY MARKING THE DRAWINGS)

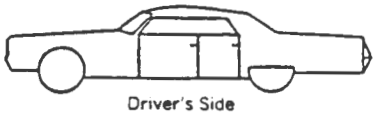
INTERIOR ALL DOORS LOCKED	YES ☐	NO ☐

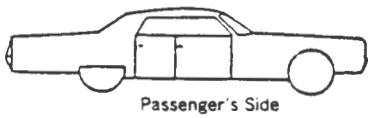
B-BENT D-DENTED

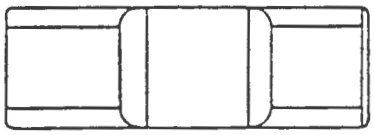
T-TORN M-MISSING

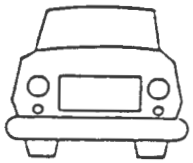
BR-BROKEN S-SCRATCHED

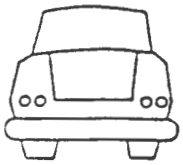
CH-CHIPPED GC-GLASS CRACKED


Driver's Side


Passenger's Side


Top View


Front


Rear

LIST AND IDENTIFY VALUABLE CONTENTS OF PASSENGER COMPARTMENT

DAMAGE DESCRIPTION (BRIEFLY DESCRIBE ANY EXISTING DAMAGE)

TYPE OF TOW WHEELS OFF GROUND ☐ FRONT ☐ REAR ☐ ALL

VERIFICATION OF VEHICLE CONDITION

STORAGE ATTN. SIGNATURE

CRANE OPERATOR'S SIGNATURE

VEHICLE DISPOSITION

RELEASED TO:
NAME (print) TIME OF RELEASE

OP. LIC. NO.

STREET

CITY & STATE

No. 083428

DOT-CA-1 (11/78)
J-90789

FIGURE 4-9. TOWING AND IMPOUNDMENT DRIVER FORM

also fills out the vehicle description portion of the form and assigns a space to the vehicle. The tow truck operator puts the vehicle in the assigned space and returns to the assigned towing station.

An owner who wants to have a vehicle released must have the case adjudicated and/or pay all outstanding warrants plus a $50 tow fee. The vehicle owner then takes the appropriate receipts to the impoundment lot, shows them to the lot attendant and has the vehicle released. Vehicles that are not claimed at the impoundment lot are relocated to Blue Plains for auction. This activity is performed by the Metropolitan Police Department (MPD).

BUREAU OF TRAFFIC ADJUDICATION (BTA)

Contested and other traffic related violations are decided by adjudication. Previously, this process occurred in criminal court with judges, prosecutors, and police officers in attendance. However, in the District of Columbia, with the implementation of the PEP, the judicial adjudication process (Criminal Division of Superior Court) was converted to an administrative process (BTA).

Judicial Adjudication Prior to PEP

Formerly the judicial adjudication process for parking violation and minor traffic cases took place in the Traffic Court of the Criminal Division of the Superior Court. A person contesting a parking ticket had to appear at the Superior Court Central Violations Bureau to receive a court date. A person who received a citation for a minor moving violation would be assigned a court date by the police officer who issued the citation. Serious offenses, such as driving while intoxicated, were tried in a different criminal court.

Traffic Court also had the responsibility for arraignment of defendants in serious traffic cases and in cases where violators with outstanding warrants were arrested by police. The arraignment process involved informing the defendant of the charges against him, arranging for defense counsel, and releasing the defendant on bail or personal recognizance.

The Traffic Court was involved in the disposition of 300 to 400 cases on an average day. Traffic Court required the presence of police officers, prosecutors, the defendant, a judge, and administrative support personnel for each case.

An individual who received a parking ticket or other minor moving violation in D.C. under the judicial adjudication process had three options: to pay the ticket, to contest it, or to ignore it. These options and the possible consequences of each are listed in Figure 4-10.

In 1975, approximately 75 percent of all traffic court cases resulted in the defendant failing to appear, as illustrated in Figure 4-11. The next largest category was "Government drops charges" with 17.2 percent. Only one percent of all the cases actually came to trial.

Administrative Adjudication After PEP

Administrative adjudication changed the process for contesting parking (and minor moving) violations. Contesting is now handled in an administrative process rather than a judicial process. Violations are decriminalized, which means they are no longer punishable by incarceration. The ticket becomes a part of a civil suit--the ticket (for the city's interest) vs. the vehicle owner. This case is handled administratively by a hearing examiner. For parking violations, the hearing examiner (who functions in the same capacity as a judge) reviews the ticket and listens to the plea and/or explanation of the vehicle owner. The hearing examiner then renders a decision. In this administrative process, the ticket serves as the city's claim and eliminates the need for a prosecutor and issuing officer to be present. In the District of Columbia, the administrative hearings are conducted within the BTA.

BTA began processing violations and administrative adjudication of contested parking and minor moving violations* in February 1979. BTA handles cases from D.C. DOT enforcement and MPD enforcement. The BTA employs approximately 60 people. As shown in Figure 4-12, the BTA is divided into two divisions: the Processing Division and the Hearing Division.

Processing Division

The Processing Division has three sections: information, correspondence, and payments. All three sections perform administrative processing tasks. The information section, which consists of a telephone unit work leader, a walk-in unit and information

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* Serious offenses continue to be adjudicated judicially in the criminal court system.

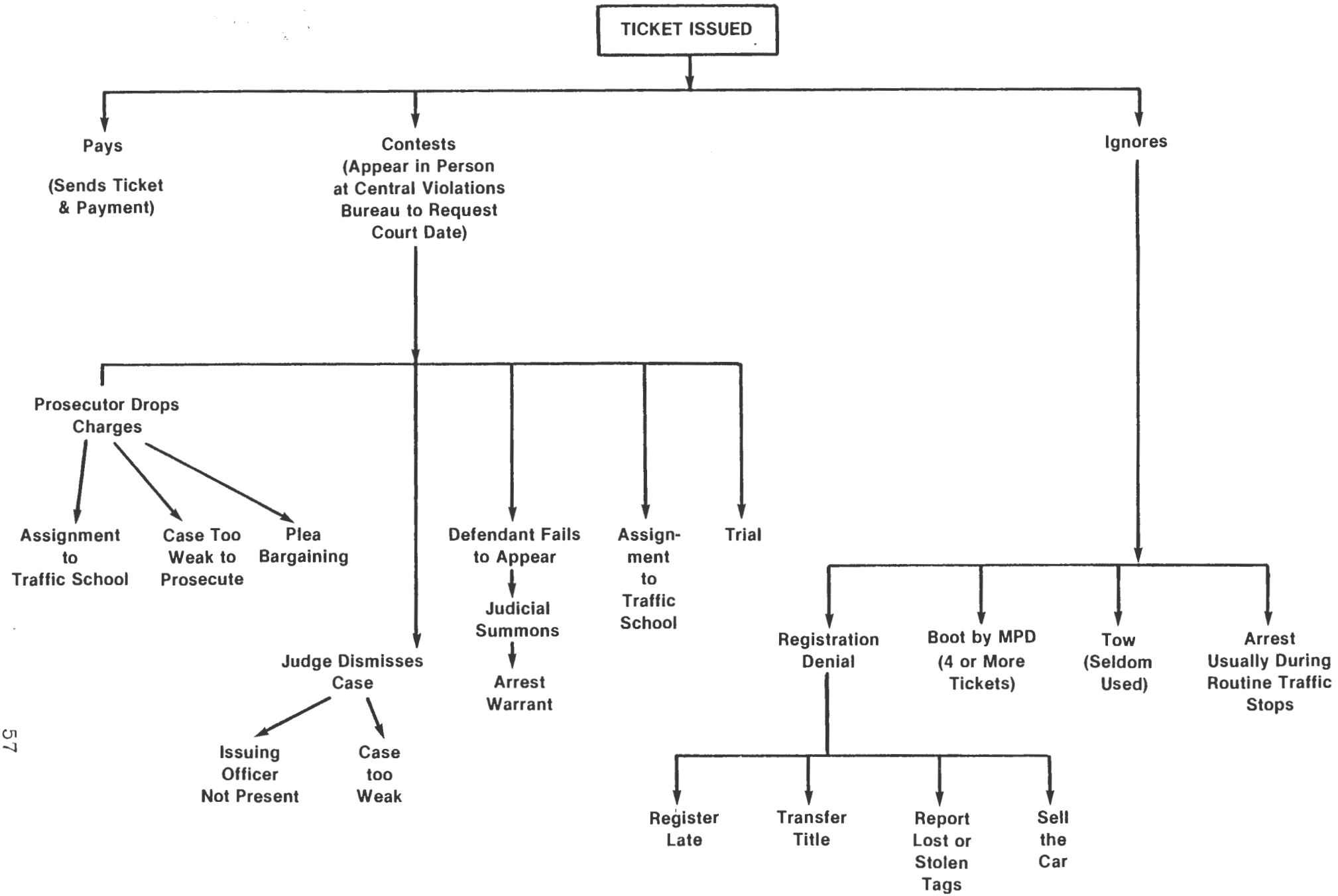

FIGURE 4-10. PARKING TICKET FLOW UNDER JUDICIAL ADJUDICATION

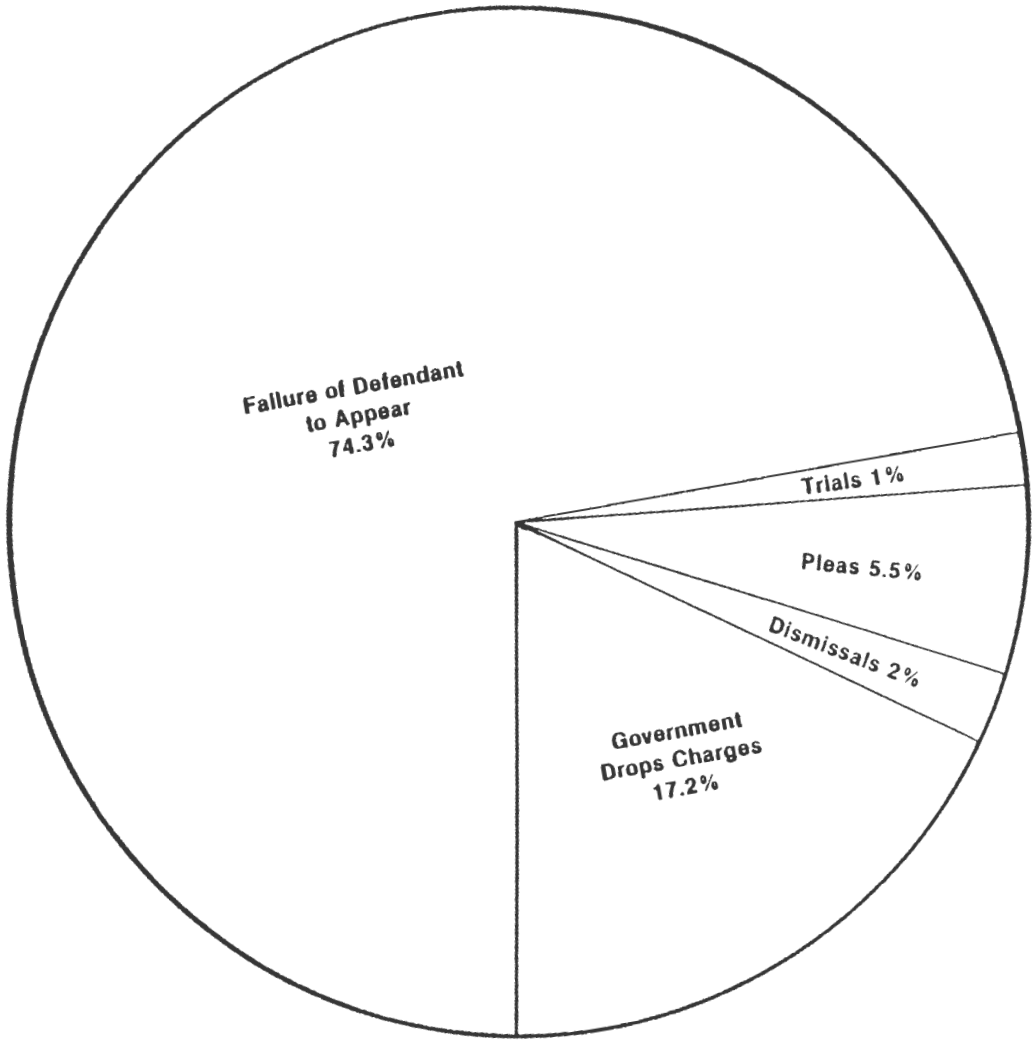

FIGURE 4-11. DISPOSITION OF TRAFFIC COURT CASES (1975)

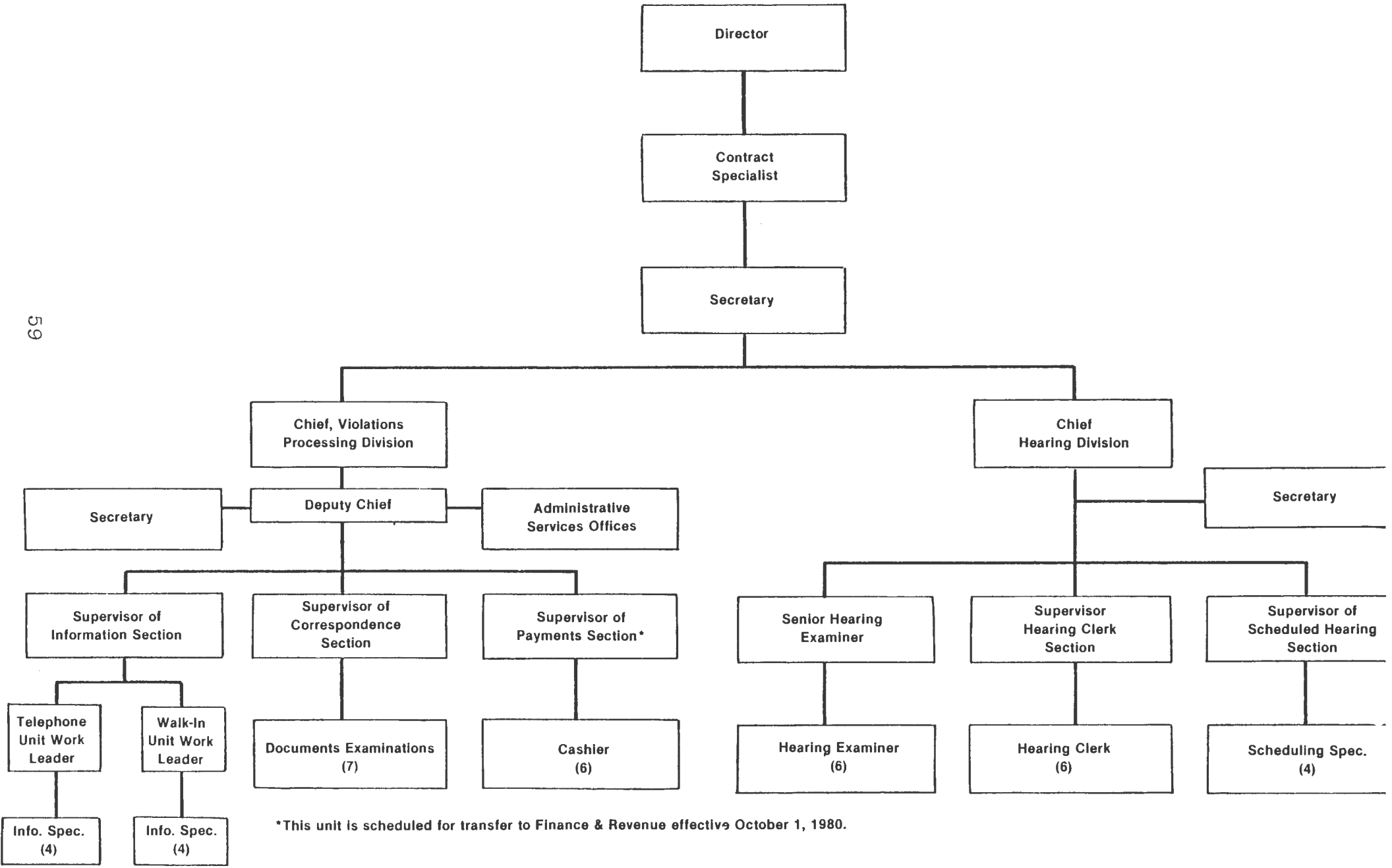

FIGURE 4-12. BUREAU OF TRAFFIC ADJUDICATION

specialists, answers questions about BTA's administrative adjudication processes for the general public.

The correspondence section, which consists of a supervisor, a senior documents examiner and six documents examiners, receives, reviews and distributes all correspondence throughout the BTA. The payments section, a part of the Finance and Revenue Department, is located at BTA's office and works within the Processing Division collecting payments for tickets, tow fines, and booting fines. The majority of the employees in the processing division have an administrative/clerical background and were trained when adjudication was handled in the court system.

Hearing Division

The Hearing Division is divided into three sections: the hearing examiners, the hearing clerks, and the scheduling specialists. Hearing examiners have replaced judges. The examiners listen to the pleas and explanations of the persons before them and render a decision. Additionally, hearing examiners review and decide cases that are contested by mail. Although admission to the bar is not required, hearing examiners are required to have law degrees. It is preferable for the hearing examiners to have some traffic experience. When BTA was formed, the hearing examiners had a three week, formalized training program. Now, new hearing officers are trained by watching the process for two weeks.

The second and third sections of the Hearing Division, the hearing clerks and scheduling specialists, perform administrative duties assisting the hearing examiners. The hearing clerks prepare paperwork for the hearings and enter the dispositions of the adjudicated cases into the on-line computer terminal. The scheduling specialists schedule special hearings (e.g. hearings for owners of fleets of vehicles that have received tickets--private companies, rental car agencies), and hearings where the issuing officer's presence is required (e.g., minor moving violations). The scheduling specialists and hearing clerks, like the employees of the Processing Division, have administrative/clerical backgrounds and received training when adjudication was handled in the court system. Most of these employees were transferred from the District Court to BTA.

Daily Operations

A person who receives a parking ticket may pay the fine, contest the violation or ignore the ticket. These options and their consequences under the administrative adjudication process are illustrated in Figure 4-13.

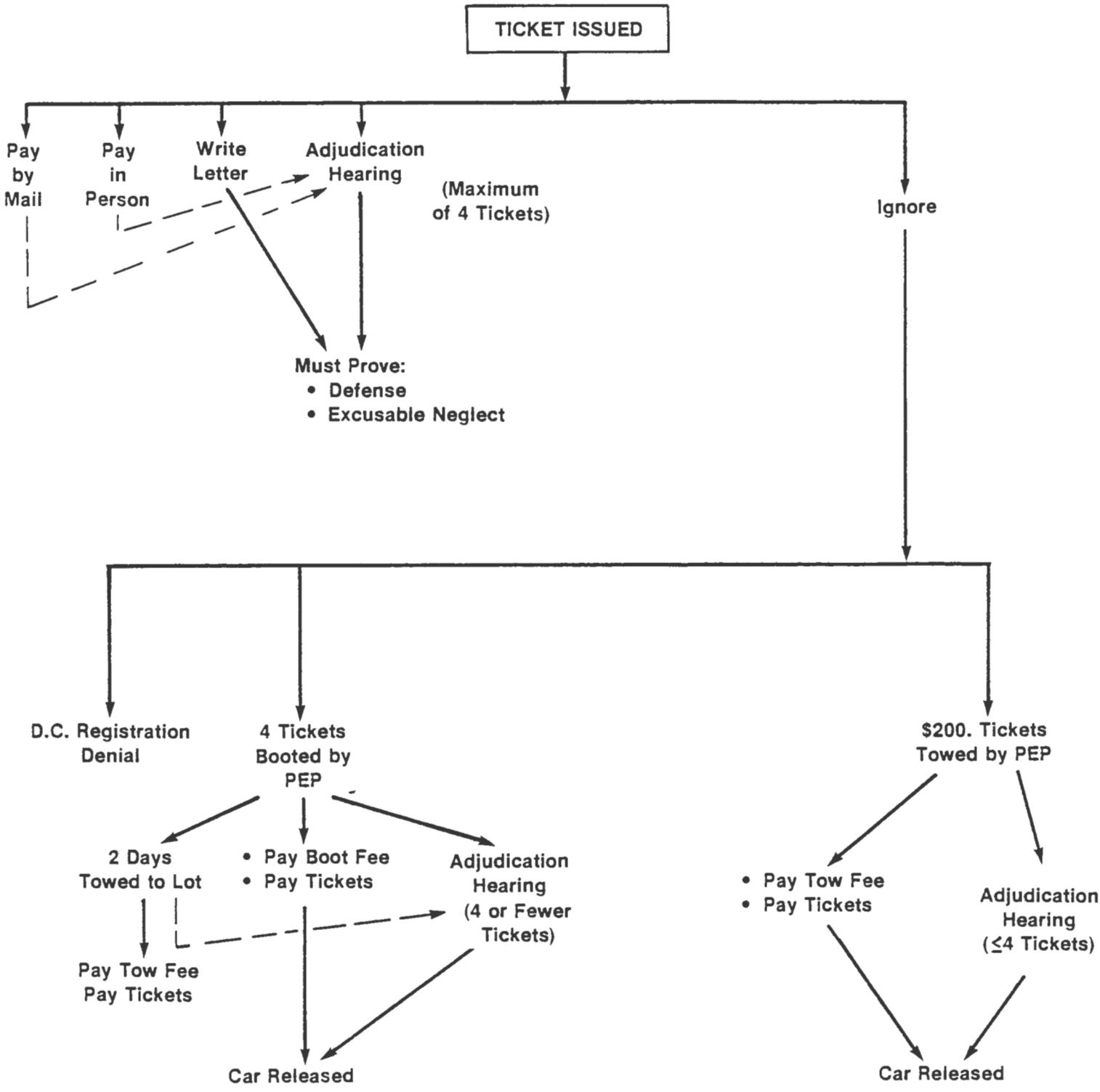

FIGURE 4-13. PARKING TICKET FLOW UNDER ADMINISTRATIVE ADJUDICATION

Another part of the daily operations of BTA is the processing of tickets. Copies of the tickets issued by the PCAs and the police are sent to BTA. BTA personnel check them for proper coding, batch them by type, and verify the number submitted. The data entry of the tickets is performed by an outside contractor. Errors in the data entry (e.g., wrong ticket number or incorrect entry in a field) can be corrected by only a few people within BTA.

Tickets which are paid by mail are sent to a lock box at the bank used by the city. The bank processes and deposits these payments directly.

5. PRODUCTIVITY AND COSTS OF THE PROGRAM

Production and cost goals for the enforcement program were established by the District of Columbia Department of Transportation (D.C. DOT) before the program began. This section examines the success of the program in meeting these goals.

PRODUCTIVITY

Production goals for the three branches of the Parking Enforcement Division were proposed before the program began. These production goals established the expected level enforcement activity for each branch. The productivity of the program can be measured in reference to these production goals. Productivity is defined as the change in output per unit of input. In the case of a parking control aide (PCA), for example, productivity would be measured as the change in tickets per day per PCA. This subsection discusses the success of the program in meeting these goals.

Ticket Writing Branch

When the civilian ticket writing branch was proposed, a goal of 975,000 additional parking tickets per year was set. This number was in addition to the approximately 1.26 million tickets being written by the Metropolitan Police Department (MPD) in 1975. Figure 5-1 shows the level of ticketing in Washington, D.C., before and after the institution of the parking enforcement program (PEP). The first bar indicates the number of MPD tickets (1.26 million) written in calendar year 1975, the second is the proposed volume for PEP alone, and the last two cars illustrate the total number of tickets written during Fiscal Years (October to September) 1979 and 1980 by both MPD and PEP. As shown in this exhibit, D.C. DOT met its proposed volume target during FY 1980.

The proposed volume of tickets translates to 3,900 per day, assuming 250 working days per year. During FY 1979, D.C. DOT wrote an average of 3,756 tickets per day, only 3.8 percent below the target. The daily average was increased by 10.7 percent to 4,259 tickets per day during FY 1980, 6.6 percent above the proposed volume.

These goals were met through higher levels of productivity of the PCAs. When the program started, it was assumed that each of the 50 PCAs would write 75 tickets per day; however, since the program began, D.C. DOT has been able to place an average of only 38 PCAs per day on patrol due to turnover and absenteeism. However, with 31.5 percent fewer personnel, D.C. DOT was able to surpass its production goal of 75 tickets per PCA to 96 (an

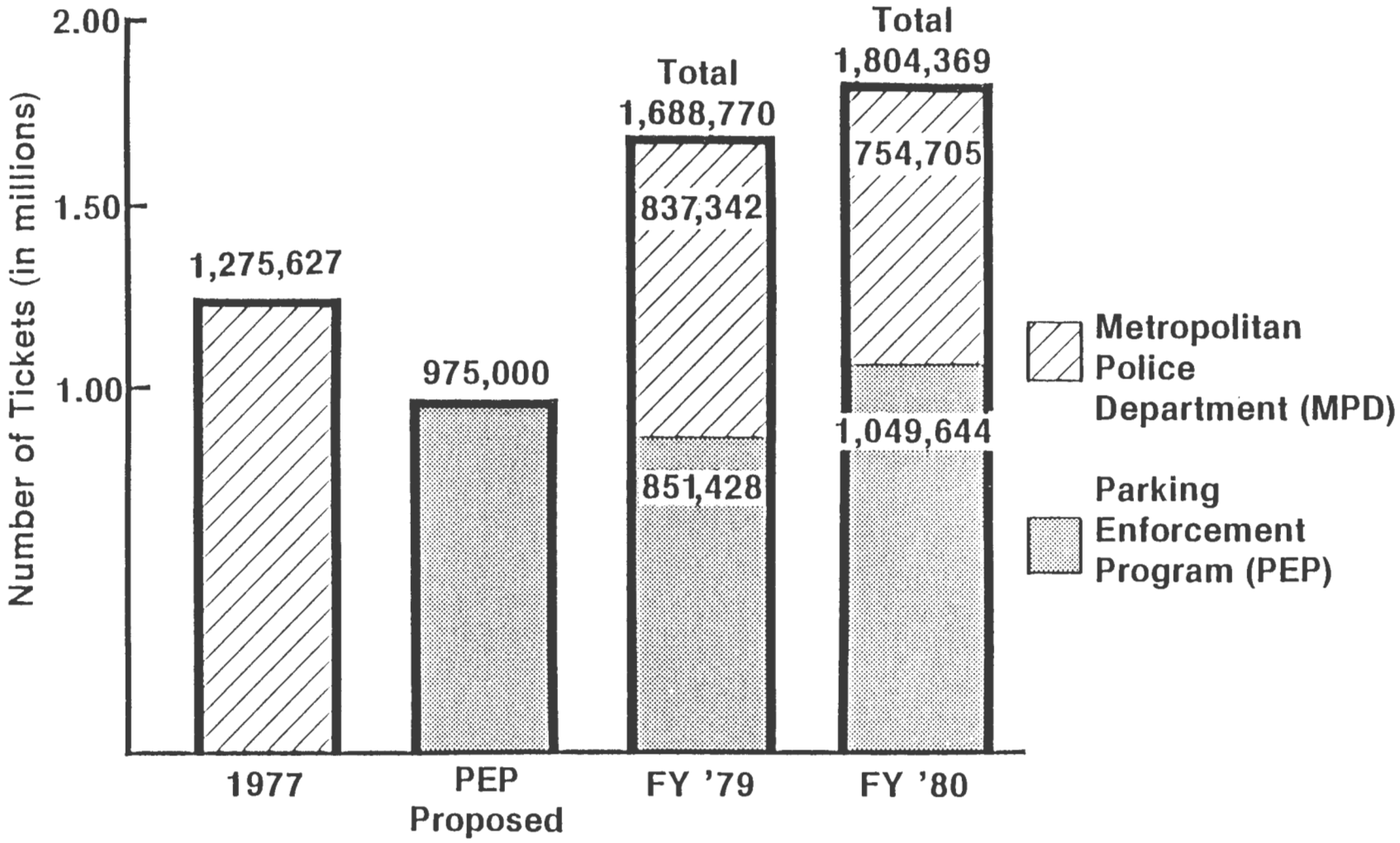

FIGURE 5-1. NUMBER OF TICKETS ISSUED

increase of 28 percent). During FY 1980, the average number of tickets per PCA was further increased to 109 tickets per day.

D.C. DOT attributes the increase in productivity to improved training combined with personnel and resource management. As stated in the previous section, D.C. DOT's management philosophy is to place the responsibility of day-to-day operations with the lowest possible level of management. In this case, it is the supervising PCA who goes out in the field with the squad. Efforts are made to instill responsibility and pride into the branch. Each squad acts as a team, and friendly competition between squads is fostered. A daily tote is maintained listing the highest number of tickets per PCA and per squad. Paper awards and social functions are also part of the effort to build a team spirit.

Vehicle Immobilization (Booting) Branch

D.C. DOT proposed to boot 20,000 vehicles once the enforcement program began. Figure 5-2 compares this proposed level to the actual MPD bootings in 1976 and the combined MPD and D.C. DOT bootings in Fiscal Years 1979 and 1980. The goal of 20,000 annual bootings translates to 80 bootings per day. Once the D.C. DOT effort began, they were able to achieve this target by July 1979. In fact, the average daily number of bootings was 74 per day during FY 1979. During FY 1980, the average was increased to 97 bootings per day, exceeding the target value of 80 by 21 percent and representing a 31 percent increase over the previous fiscal year.

Releasing a booted car requires an average of 30 minutes during the day and 60 minutes in the evening. An average time for releasing MPD boots was unavailable, although it is perceived to be longer because MPD/SOD has higher priority duties than booting and releasing boots.

There has not been significant change in the number of scofflaws before and after PEP--90,000 before and 100,000 after. The average ticket value has decreased from over $200 before to approximately $140 after PEP. This shows that while the program has not reduced the number of scofflaws, it has reduced the amount of unpaid tickets. This is particularly significant since the average dollar value per violation is higher now than before PEP.

The biggest problem the booting branch has encountered since its implementation was the change of license plates on Maryland vehicles in April 1980. This change made it necessary to acquire a conversion computer tape from Maryland to identify the scofflaws' new tag numbers. During the period when the Maryland Motor Vehicle Administration was preparing the conversion tape, the booting crew could boot only Maryland vehicles that had received an excess number of tickets with the new tag numbers. Rather

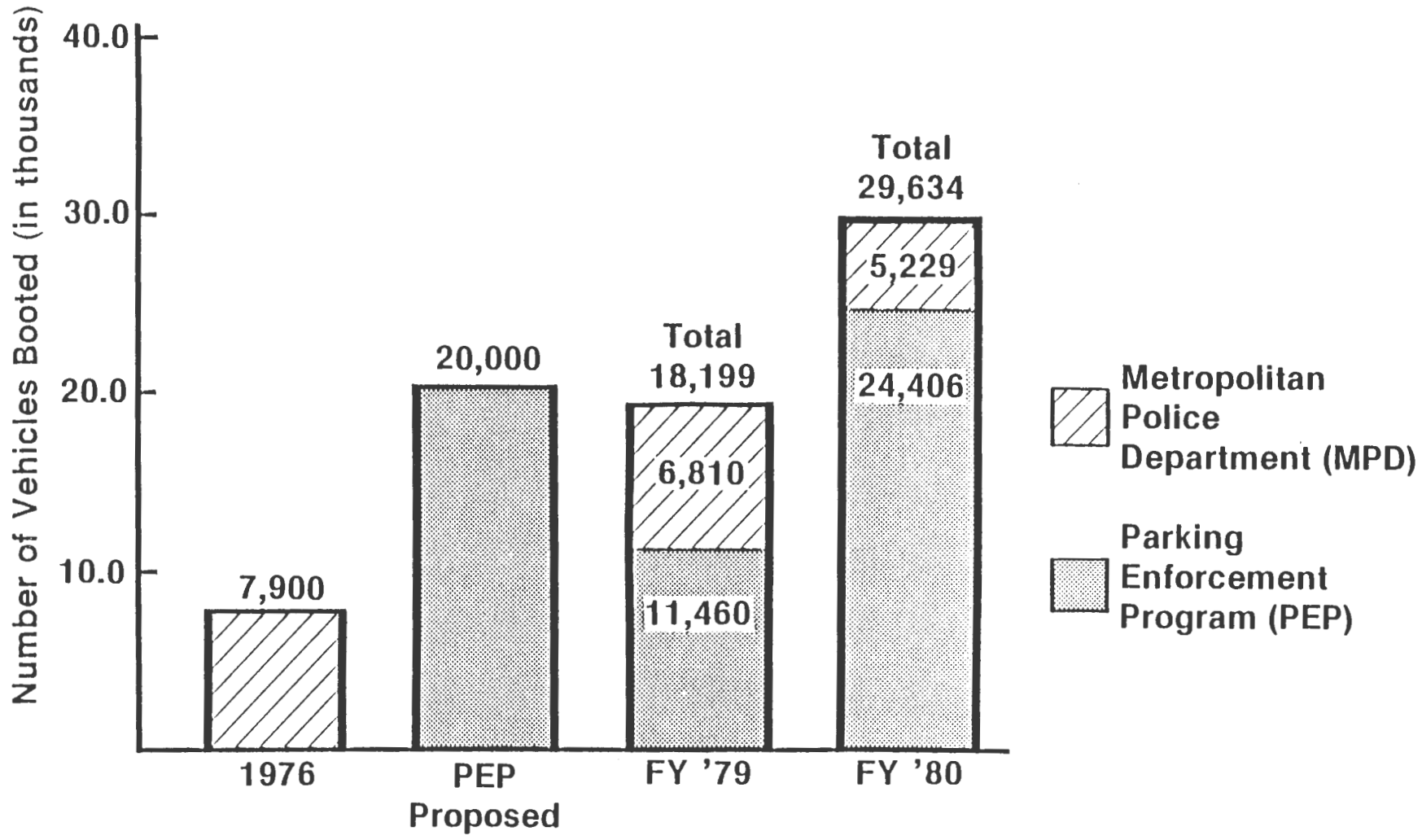

FIGURE 5-2. NUMBER OF VEHICLES BOOTED

than laying off booters or decreasing productivity, D.C. scofflaw vehicles were booted.

Towing Branch

As shown in Figure 5-3, the number of vehicles towed by D.C. DOT is more than twice the number towed by MPD before PEP. However, the actual numbers are considerably lower than projected. The proposed level of towing was based on the assumption that 450 vehicles could be towed daily. This assumption further implied that the fleet of 25 tow trucks would each tow 37 vehicles per day or an average of 1.5 vehicles per hour.

Once the towing portion of the program began, it became apparent that finding 450 violators who were creating a significant traffic flow or safety hazard would be difficult. Although more than 450 technically towable offenses exist, towing a technical violator is more likely to generate ill will than to achieve program goals of increased traffic flow and safety. The PCAs are required to make this determination every time they request a tow.

A contributing factor to the inability to meet the proposed goal is illustrated in Figure 5-4. The pie chart shows that 69 percent of all tow requests result in a vehicle being towed. The "gone on arrival" (GOA) category accounts for 26 percent of the total. D.C. DOT policy requires the tow truck operator to return the vehicle to the owner if the owner arrives before the tow truck leaves. This occurs 5 percent of the time.

Information from the tow request forms for a one-week period was used to determine the average times for towing a vehicle. The average mean times and standard deviations are shown as Table 5-1. The average time for towing a vehicle is approximately 16 minutes from dispatch to finishing the hook-up. An attempt was made to verify these times using the data from the towing forms. The attempt proved impossible because in the often hectic operation of the communications center, information is received and times are punched on the cards simultaneously.

The major problems of the towing branch relate to the hectic environment of the communications center and the use of a contractor for towing. The two frequencies operated by the communications center are often so full that PCAs, booters, and tow truck operators must wait to call in requests or receive verifications. This results in slowed down productivity. D.C. DOT is currently trying to work out an arrangement to take over a seldom used frequency of the MPD.

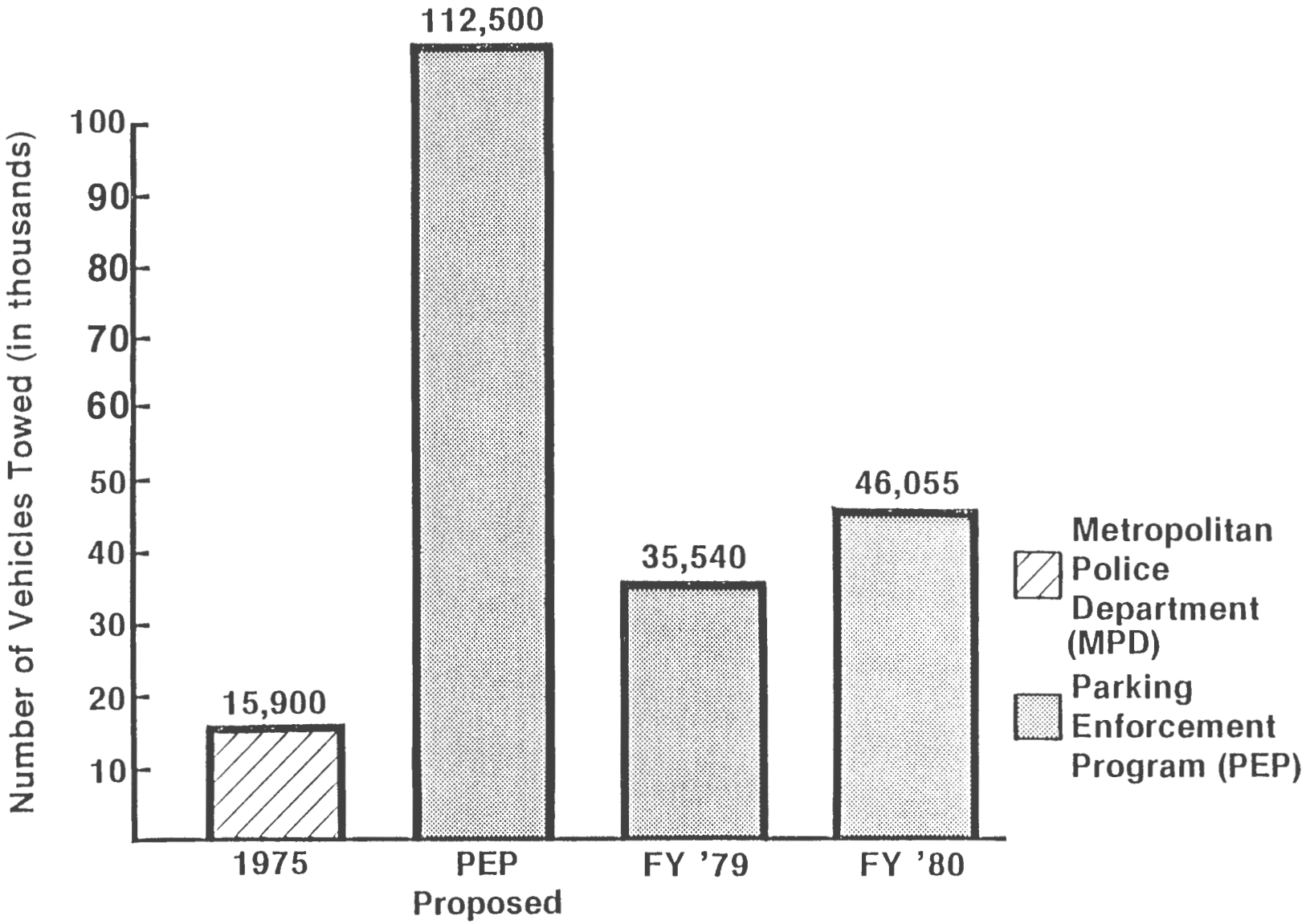

FIGURE 5-3. NUMBER OF VEHICLES TOWED

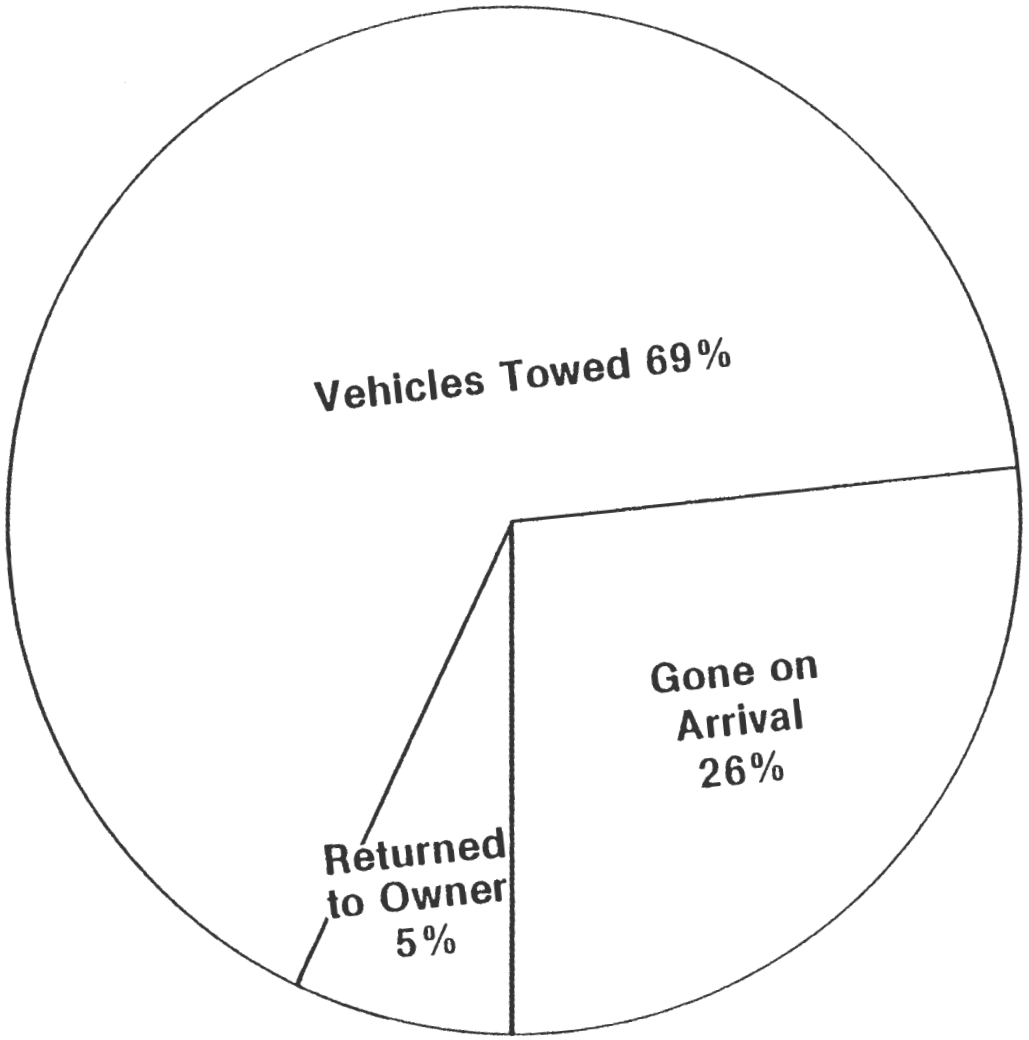

FIGURE 5-4. DISPOSITION OF TOW REQUESTS

TABLE 5-1. AVERAGE TIME (Minutes) IN TOWING PROCESS*

Dispatch to Arrive At Vehicle		Arrive Vehicle to Finish Hookup		Finish Hookup to Arrive at Lot		Dispatch to Finish Hookup		Dispatch to Arrive at Lot	
Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
8.34	1.34	6.87	0.81	9.40	0.91	16.09	2.24	24.09	3.35

* Averages do not sum because data were compiled from multiple resources.

The use of the towing contractor has proved less than satisfactory in many instances. Originally the contractor was paid a fixed amount per tow. Problems occurred when owners would return to their vehicles while the tow truck was there. While D.C. DOT has a policy of returning these vehicles to their owners rather than towing, overzealous tow truck operators often refused to do this because it would result in fewer tows for the day and less money. An attempt to correct this situation was made by changing the contract from rates-per-tow to hourly rates. Nevertheless, it still appears that D.C. DOT could tow vehicles in a more cost-effective manner.

Parking Enforcement Branch

The overall D.C. DOT parking enforcement activity since the program began is illustrated in Figure 5-5. This exhibit shows the average daily number of tickets issued, vehicles booted, and vehicles towed. As described earlier, the proposed targets and both ticketing and booting have been exceeded by D.C. DOT. The ticketing branch achieved its goal by March 1979 but slid below this target from July to December 1979. The booting branch reached its goal by July 1979 and remained above this goal except for April 1980 (the month in which Maryland changed its license plates and correspondence tables were not yet available).

After two years of operation, some seasonal patterns are beginning to emerge. The large dip in ticket writing in February 1979 was due to severe winter weather. Ticket writing seems to peak around April and May and slacken during the summmer months. Overall, ticketing and booting has tended to grow, and towing is still adjusting to policy changes.

Bureau of Traffic Adjudication (BTA)

In 1975, only one percent of all cases actually went to trial for parking and minor moving violations. Since the implementation of PEP, the BTA has heard approximately 250 cases per day for parking violations and 75 cases per day for moving violations. Approximately 4 percent of all parking violations are settled by administrative hearings, demonstrating the success of BTA in being able to give more individualized attention to those people who wish to contest their violations than did the court system. Of the cases adjudicated, the distribution of the decisions rendered is shown in Figure 5-6. Although at first glance the percent of reductions, dismissals, and not liables appears high, it is important to remember that hearings are held for a very small percent of all tickets issued (approximately 4 percent or less). This seems to indicate that persons seeking hearings have received tickets incorrectly issued and/or can show excusable neglect.

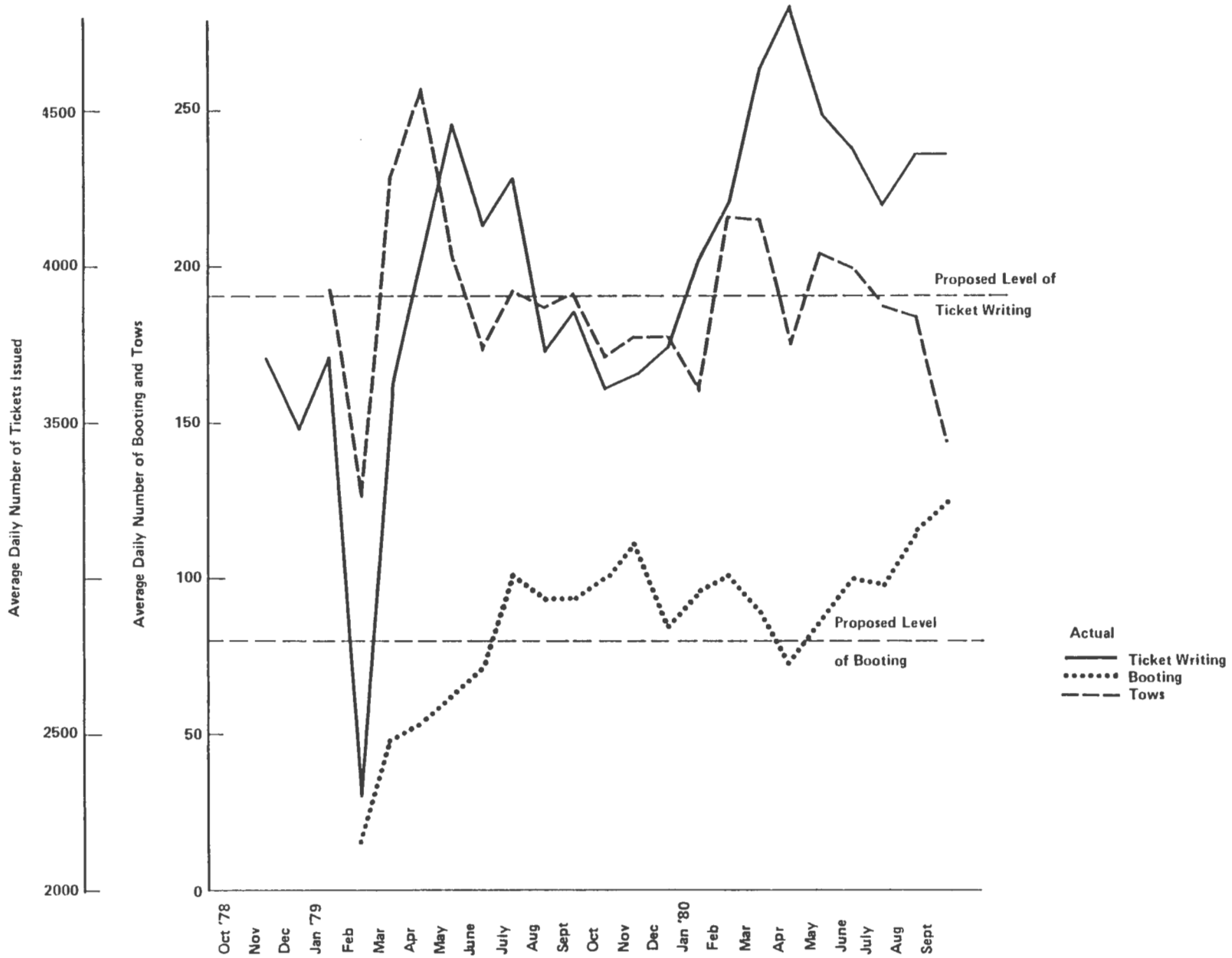

FIGURE 5-5. AVERAGE DAILY D.C. DOT ENFORCEMENT ACTIVITY BY MONTH

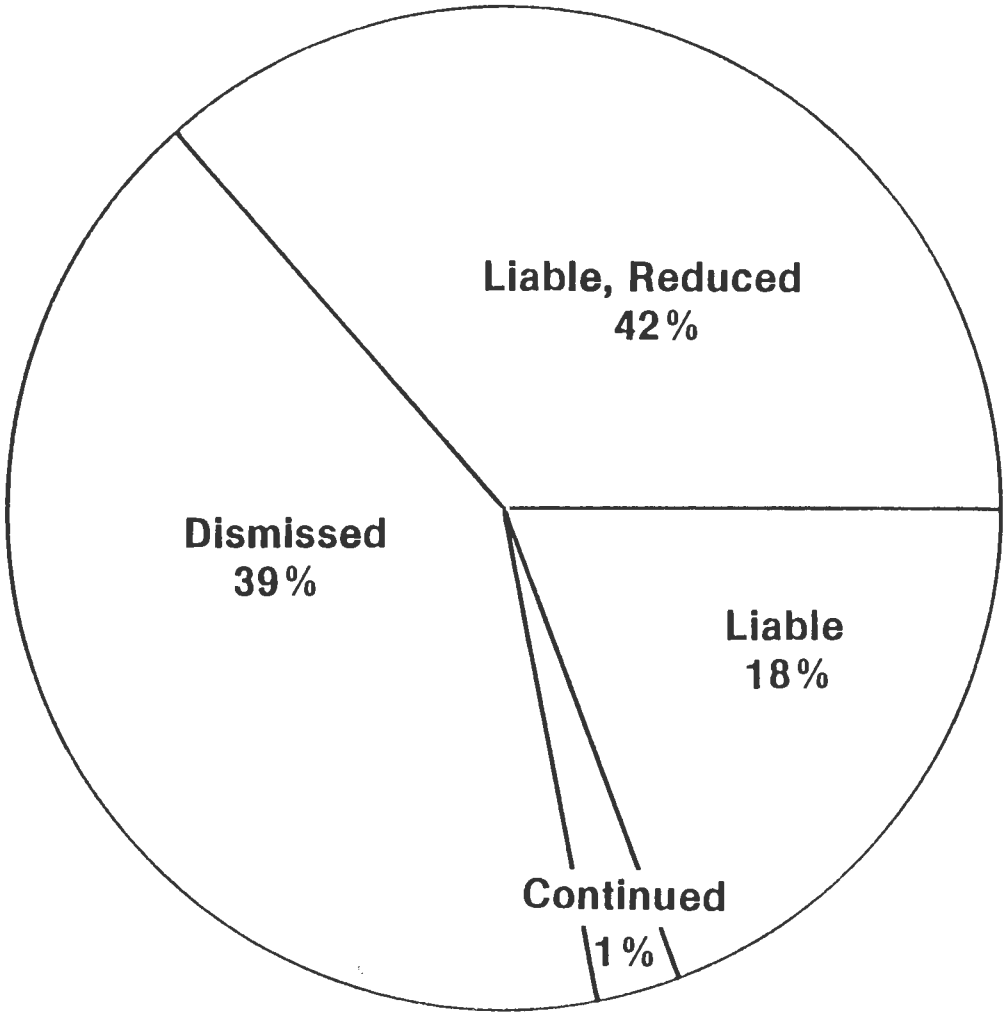

FIGURE 5-6. DISPOSITION OF ADJUDICATED CASES

One of the other goals of administrative adjudication was to reduce the wasted time that issuing officers and defendants had to spend waiting in court. Implementation of administrative adjudication eliminated the need for the issuing officer's presence for parking violations. As for those seeking a hearing, it is unclear whether or not their waiting time has been reduced. However, some positive change has occurred. In the judicial system the defendant was required to sign-in at 9:30 a.m. on the assigned court day and wait until the case was called. With the administrative adjudication, the person seeking a hearing may choose the time to come to BTA (within the constraints of BTA's hours of operation). Evening hours provide flexibility for those who work during the day and do not wish to miss work to contest a violation.

A problem that BTA has attempted to solve is that of registration time "rush." Under the judicial system many people would collect tickets all year long, appear in court prior to registration, and plead for the court's mercy. In many cases, because of the overload of the court system these people received reduced or no fines. With administrative adjudication this problem is solved. Even at registration time a hearing may be held for up to four tickets only. No group reductions or dismissals are proclaimed; each case is handled individually. The first year there was a heavier load at registration time, but in more recent years the load has decreased slightly.

Most of the problems BTA currently faces relate to data processing. BTA is part of a city-wide financial management system (FMS) which has been plagued with problems from its inception and still does not operate. BTA has very little data because all data collection is based on their own inoperative system or on FMS. Additionally, the on-line system for hearings has proved less than satisfactory. Whenever the computer fails, BTA must decide whether to try to conduct makeshift hearings or shut down the hearing process completely. Until the FMS is operational, it will be extremely difficult for BTA to monitor and evaluate its process and output.

COST ANALYSIS

This subsection analyzes the operating and initial capital costs associated with the civilian PEP in Washington, D.C. The costs for both D.C. DOT Parking Enforcement Division and the BTA are discussed.

Parking Enforcement Division

Operating Costs

The Parking Enforcement Division, as discussed earlier, is divided into the ticket writing, booting and towing branches. Fiscal Year 1980 (October 1979 to September 1980) operating costs for all three branches are presented in Table 5-2. These cost figures were derived from the information provided to Peat Marwick from D.C. DOT and are subject to the assumptions detailed in the notes to Table 5-2.

As expected for such a labor intensive operation, the largest cost item is for salaries. Salaries and benefits combined account for 52 percent ($1,814,732) of the total operating cost when the Office of Assistant Director costs are included. The towing contract is the second largest cost item at 35 percent of total operating costs. Vehicle maintenance and gasoline represent another significant cost item for a total of $131,859. Other noteworthy cost items include: uniforms, security guards, and ticket printing.

Before the program began, budget proposals prepared by D.C. DOT estimated that the continuing costs of the program for FY 1978 would be $3,037,512, excluding the Office of Assistant Director. The FY 1980 costs are only 14 percent greater than these FY 1978 estimates. During this period, D.C. government salaries have increased for the "GS" series by 7.2 percent, accounting for some of the cost increases. However, the use of Comprehensive Employment and Training Act (CETA) employees and the increased productivity of the enforcement staff has helped to keep costs lower. Vehicle maintenance and gasoline comprise one item that has varied significantly from the proposed budget. This cost category was budgeted for $37,000 in FY 1978, but cost $131,859. This discrepancy is partially explained by the fact that the budget estimate was made for more fuel-efficient vehicles and at a time of lower fuel costs. Radio maintenance was estimated at $5,000, but currently costs $15,000 per year. Several items were not explicitly considered in the original enforcement budget proposal; these included building maintenance, security guards at the main building, and the cost of printing parking tickets. Ticket printing was the most significant at $73,320. However, the price of ticket printing was included in the BTA budget. This 14 percent increase in cost is placed in perspective when compared to the 19.8 percent rise in the Consumer Price Index between 1977 and 1978.

Initial Capital Costs

The initial capital costs for the parking enforcement division are presented in Table 5-3. This table shows initial cost,

TABLE 5-2. PARKING ENFORCEMENT DIVISION: OPERATING COST (Fiscal Year 1980)

Cost Category	Ticket Writing	Booting	Towing	Total
Salaries	721,743	437,796	455,673	1,615,212
Benefits	72,174	43,779	45,567	161,520
Phone	3,600	1,800	1,800	7,200
Electricity	3,250	1,625	3,125	8,000
Heat	2,575	1,288	1,287	5,150
Maintenance				
- Vehicle	42,480	13,200	1,104	56,784
- Radio	10,350	3,150	1,500	15,000
- Building	14,000	7,000	7,000	28,000
- Impoundment Lot	--	--	4,500	4,500
Uniforms	19,880	2,500	3,420	25,800
Printing (Forms)	3,500	3,500	3,000	10,000
Supplies and Materials	1,500	1,500	1,500	4,500
Security Guards				
- Main Building	13,000	6,500	6,500	26,000
- Impoundment Lot	--	--	127,430	127,430
Towing Contract	--	--	1,212,500	1,212,500
Replacement Boots	--	6,000	--	6,000
Ticket Printing	73,320	--	--	73,320
Gasoline for Vehicles	40,425	30,250	4,400	75,075
Subtotal	1,021,797	559,888	1,880,306	3,461,991
Office of Asst. Dir.	21,500	10,750	10,750	43,000
TOTAL	1,043,297	570,638	1,891,056	3,504,991

This table has been prepared based on information provided by D.C. DOT. Peat Marwick has not verified this information. The reported cost figures are subject to the assumptions described in the text and the table notes.

Notes

. Salaries: Figure calculated from sick leave records.

. Benefits: Figure calculated as 10 percent of salaries.

TABLE 5-2 (Continued)

- Phone: Total is $14,400. This figure was allocated as follows based on D.C. DOT estimates:

Ticket Writing	25.0%
Booting	12.5%
Towing	12.5%
Total Enforcement	50.0%

- Electricity: Total is $13,000. This figure was allocated in the same manner as the phone cost above. Towing incurs an additional $1500 for electricity at the impoundment lots.

- Heat: Total is $10,300. This figure was allocated in the same manner as the phone cost.

- Vehicle Maintenance:

	No. of Vehicles	Estimated Average Monthly Cost	Annual Cost
- Ticket Writing			
Chevettes	21	$140	$35,280
Vans	6	$100	7,200
Total Ticket Writing			$42,480
- Booting (Vans)	11	$100	13,200
- Towing (Pick Up Trucks)	2	$ 46	1,104
Total			$ 56,784

- Radio Maintenance:

	No. of radios	%	Annual Cost
Ticket Writing	56	69	$10,350
Booting	17	21	3,150
Towing	8	10	1,500
Total	81	100	$ 15,000

- Building Maintenance: Total is $56,000. This figure was allocated in the same manner as the phone costs above.

- Impoundment Lot Maintenance: FY 1980 allocation is $4,500.

TABLE 5-2 (Continued)

- Uniforms:

	No. of Uniforms	Uniform Cost	Annual Cost
Ticket writing	56	$355	$19,880
Booting	20	125	2,500
Towing	19	180	3,420
Total			$ 25,800

- Printing: Total is $10,000. Ticket writing and booting were allocated $3,500 each and the remaining $3,500 was allocated to towing.

- Supplies and Materials: Approximately $1,500 was spent by each branch.

- Security Guards at Main Building: Total is $52,000. This figure was allocated in the same manner as the phone costs.

- Security Guards at Impoundment Lots:

  10 guards @ $12,743 per year: $127,430.

- Towing Contract: The FY 1980 towing contract was $1,212,500.

- Boots: Twenty boots are replaced per year at $300 per boot. Total cost was $6,000.

- Ticket Printing: One million tickets cost $63,500. D.C. DOT wrote 1,049,644 tickets in FY 1980. Allowing for a 10 percent soilage rate, the annual cost is $73,320.

- Gasoline for Vehicles: Gasoline cost $1.10 per gallon. Vehicles operate 250 days per year.

	No. of Vehicles	Gallons per Day	Annual Cost
Ticket writing:			
Chevettes	21	5	$28,875
Vans	6	7	11,550
Total			$40,425
Booting:			
Vans	11	10	30,250
Towing:			
Pick-up Trucks	2	8	4,400
TOTAL			$ 75,075

- Office of Assistant Director: Salaries and benefits for staff total $86,000. This figure was allocated in the same manner as the phone costs.

TABLE 5-3. PARKING ENFORCEMENT DIVISION: INITIAL CAPITAL COST

Cost Category	Initial Cost (a)	Estimated Life Span (Years)	Amortized Annual Cost
Office Space Renovation	$ 88,500	10	$ 8,850
Telephone Installation	600	10	60
Office Furnishings	41,300	10	2,065
Vehicles	202,000(b)	5	40,400
Boots	120,000	20	6,000
Impoundment Lot Construction	1,350,000(c)	20	67,500
Trailers	9,000(d)	10	900
Trailer Utility Connection	12,000	10	1,200
Two-Way Radios	101,250(e)	6	16,875
Radio Transmission Station	29,000(f)	10	2,900
Computer Terminal	17,000	6	2,835
TOTAL	$ 1,970,650		$ 149,585

Notes:

(a) All cost figures from D.C. DOT FY 1980 Budget Worksheets unless noted.

(b) Vehicles:

21 Chevettes	@	3,400	71,400
6 Vans	@	7,800	46,800
11 Vans	@	6,800	74,800
2 Pick-Up Trucks	@	4,500	9,000
TOTAL			202,000

(c) Impoundment Lot Construction:

Brentwood		900,000
Georgetown		450,000
TOTAL		1,350,000

(d) Trailers: 2 trailers @ 4,500 9,000

(e) Two-Way Radios: 81 radios @ 1,250 101,250

(f) Radio Transmission Station: @ 29,000

This table has been prepared based on information provided by D.C. DOT. Peat Marwick has not verified this information. The reported cost figures are subject to the assumptions described in the text and the exhibit notes.

estimated life span in years and the amortized annual cost for each item. Thus, the first column represents the start-up costs for the enforcement program and the third column represents the amortization of these start-up costs to an annual basis. The largest cost item (68.5 percent of total costs) is for the construction of the impoundment lots. The Brentwood lot alone cost $900,000, mainly because of the need to purchase the site. The purchase of vehicles, boots, and radio equipment accounted for another 22.9 percent of the start-up costs. The original proposed budget numbers for these start-up costs went through many revisions. The figures presented here are the actual costs reported by D.C. DOT. Appropriations for these expenditures were requested and subsequently approved through the D.C. government budgeting process.

The BTA

The BTA is responsible for the processing and adjudication of both minor traffic and all parking violations. The parking violations include those issued by D.C. DOT and the MPD. The cost figures discussed below focus on estimates of operating and initial capital costs associated with the D.C. DOT Parking Enforcement Division activities.

Operating Costs

Operating costs during FY 1980 for the BTA are presented in Table 5-4. The top part of the table shows the total operating costs for both the Violations Processing and Hearing Divisions. The second section presents an estimate of the operating costs associated with all the parking enforcement activities of the Bureau. This allocation was based on the volume of parking related matters that the BTA was responsible for during FY 1980. The bottom section presents an estimate of operating costs associated with the D.C. DOT Parking Enforcement Division activities. This allocation was based on the proportion of tickets, bootings, and towing which D.C. DOT generated.

In a manner similar to the Parking Enforcement Division, salaries and benefits account for a large portion (37.8 percent) of the total operating costs. Another expensive item is the cost of inputting the violation information to the computer. Data entry accounts for 26 percent of total operating costs. All three of these costs are labor-intensive which tends to account for their higher costs. Another significant cost is postage at $286,800 (13.6 percent of total operating cost). Other noteworthy expenditures include printing, guard services, space rental, and computer communications.

TABLE 5-4. BUREAU OF TRAFFIC ADJUDICATION: OPERATING COSTS (Fiscal Year 1980)

Cost Category(a)	Violations Processing Division	Hearings Division	Total
Salaries	358,000	313,500	671,600
Benefits	35,000	31,300	66,300
Overtime	3,000		3,000
Postage	286,800		286,800
Space Rental	47,500	47,500	95,000
Computer Communications	50,000		50,000
Phone Rental	2,600	2,300	4,900
Printing	195,000		195,000
Data Entry	572,000		572,000
Armored Car Service	3,000		3,000
Supplies and Materials	24,000	11,000	35,000
Guard Service		95,000	95,000
Audio Equip. & Microfilm		30,000	30,000
Subtotal	1,576,900	530,600	2,107,500
Office of Asst. Director(b)	70,500	23,700	94,200
TOTAL OPERATING COSTS	$ 1,647,400	$ 554,300	$ 2,201,700
Percent of Total Operating Cost Allocated to All Parking Enforcement Activities	90%(c)	77%(d)	
Operating Cost Allocated to All Parking Enforcement Activities(e)	$1,482,660	$426,811	$1,909,471
Percent of Parking Related Operating Cost Allocated to D.C. DOT Parking Enforcement Activities(f)	59.6%	59.6%	
Operating Cost Allocated to D.C. DOT Parking Enforcement Activities(g)	$883,666	$245,380	$1,129,046

This table has been prepared based on information provided by D.C. DOT. Peat Marwick has not verified this information. The reported cost figures are subject to the assumptions described in the text and the exhibit notes.

TABLE 5-4. (Continued)

Notes:

(a) All cost figures are from D.C. DOT 1980 worksheets unless otherwise noted.

(b) Total salaries and benefits for the Office of Assistant Director are $94,200. Costs were allocated in proportion to the operating costs of the two divisions.

(c) Ninety percent of the violations processed by this division are parking related.

(d) Seventy-seven percent of the hearings held by this division are parking related.

(e) These cost figures represent the estimated operating costs for parking related activities in the Bureau of Traffic Adjudication.

(f) The Bureau processed a total of 1,880,058 tickets, bootings, and towings in FY80. D.C. DOT was responsible for 59.6 percent of these parking related transactions.

(g) The cost figures represent the estimated operating cost for all parking-related activities in the Bureau of Traffic Adjudication as a result of D.C. DOT Parking Enforcement Division efforts.

Initial Capital Costs

The initial capital costs for the BTA are presented in Table 5-5. The first column of the exhibit presents the total initial capital costs for both the Violation Processing and Hearing Division. The second column lists the estimated lifespan of these initial capital expenditures. The next column shows the percent of the total cost which is allocated to parking enforcement activities. The amortized annual cost (column 4) was calculated by dividing column 1 by column 2 and multiplying the result by the decimal equivalent of column 3.

The largest expense was for the purchase of a new computer system for D.C. DOT. The additions of traffic adjudication and the increased number of parking tickets served as the justification for the purchase of the computer system. Computer related items, including software development, account for 95 percent of the total initial capital cost. Another cost item of interest is keypunching. This $133,000 expense was the cost of converting existing records to the new computer system.

The PEP

The annual cost for D.C. DOT parking enforcement activities is summarized in Table 5-6. The table shows the annual operating cost for ticket writing, booting, and towing. The BTA costs were allocated to each activity based upon that branch's proportion of the total D.C. DOT parking transactions. The table also provides the unit cost per ticket, booting, or towing.

As shown in Table 5-6, it costs D.C. DOT approximately $1.00 to write a ticket strictly in terms of operating costs. The addition of the operating cost for both processing and hearings increases that cost to approximately $2.00 per ticket. The average value of a ticket issued by D.C. DOT is approximately $11.40. The average PCA writes a total of 110 tickets per day. Collections are made on approximately 60 percent of all tickets issued. Therefore, it costs $221 to write these 110 tickets, but $752 can be expected to be collected. The net is $531 per day per PCA. From a strictly financial standpoint, ticket writing is cost-effective.

The total operating costs are $24.40 for each booting. The booting fee alone is $25.00, and the average booting yields $240 in outstanding tickets for a total of $165 per booting in revenue. This makes booting cost-effective also.

TABLE 5-5. BUREAU OF TRAFFIC ADJUDICATION: INITIAL CAPITAL COST

Cost Catetory	Initial Cost (a)	% Allocated to Parking Enforcement(b)	Cost Allocated to Parking Enforcement(b)	Estimated Life Span (Years)	Amortized Annual Cost
. Violation Processing Division					
Phone Installation	500	90	450	10	45
Computer Software Development	450,000	33	150,000	6	25,000
Keypunching	133,000	90	119,700	6	19,950
Office Space Modification	23,200	90	20,880	10	2,090
Office Furnishings	18,500	90	16,650	10	1,665
Computer Center Relocation	120,000	33	40,000	10	4,000
Police Computer Links	21,500	33	7,167	6	1,195
Computer Terminals	146,000	90	131,400	6	21,900
Computer Purchase	3,600,000	33	1,200,000	6	200,000
Subtotal	4,512,700		1,686,247		275,845
. Hearing Division					
Telephone Installation	600	77	462	10	45
Office Space Modification	23,300	77	17,941	10	1,795
Office Furnishings	19,000	77	14,630	10	1,465
Subtotal	42,900		33,033		3,305
TOTAL	4,555,600		1,719,280		279,150

Notes:

(a) All cost figures from D.C. DOT 1980 worksheets.

(b) Ninety percent of the violations processed by the Bureau are parking related. Seventy-seven percent of the hearings held by this Bureau are parking related. One third of the new D.C. DOT computer system is used for parking enforcement activities.

(c) This column represents the estimated amortized costs allocated to all parking enforcement activities.

The table has been prepared based on information provided by D.C. DOT. Peat Marwick has not verified this information. The reported cost figures are subject to the text and the exhibit notes.

TABLE 5-6. D.C. DOT PARKING ENFORCEMENT PROGRAM: OPERATING COSTS (Fiscal Year 1980)

	Ticket Writing		Booting		Tows		Total
	Dollars	Dollar/Ticket(a)	Dollars	Dollars/Booting(b)	Dollars	Dollars/Tow(c)	Cost
Operating Costs(d)							
. Parking Enforcement	$1,043,297	$0.99	$570,638	$23.38	$1,891,056	$41.06	$3,504,991
. Violation Processing	827,324	0.79	19,175	0.79	37,067	0.18	883,666
. Adjudication Hearing	238,161	0.23	5,549	0.23	10,670	0.23	254,380
. AC Total Operating Cost	$ 2,108,782	$ 2.01	$ 595,462	$ 24.40	$ 1,938,793	$ 42.10	$ 4,643,037

Notes:

(a) 1,049,664 tickets were written in FY80.

(b) 24,406 vehicles were booted in FY80.

(c) 46,055 vehicles were towed in FY80.

(d) Operating costs include salaries, benefits, utilities, maintenance, uniforms, security guards, printing, contract towing service, and gasoline.

This table has been prepared based on information provided by D.C. DOT. Peat Marwick has not verified this information. The reported cost figures are subject to the assumptions described in the text and the table notes.

The total cost per tow is $42.10. With the tow fee at $50, this activity can cover its costs. However, it should be remembered that both towing and booting provide the teeth which make enforcement effective.

Overall, PEP has met its goals of increased and cost-effective enforcement. Both ticket writing and bootings have achieved production levels in excess of their proposed goals by 45 and 21 percent, respectively. Towing was scaled back to meet changing conditions but remains effective at its current level. The adjudication system has adjusted to the new levels of ticketing and the procedural changes resulting from the switch to an administrative process. The program is efficient in terms of the level of resources consumed to provide this level of parking enforcement. The effectiveness of the program is addressed in the following section.

6. CHANGES IN PARKING BEHAVIOR AND SUPPLY

Parking enforcement discourages illegal parking and encourages legal parking by increasing the perceived and actual costs of illegal parking. The Parking Enforcement Program (PEP) increases the probability that a parking violator will be ticketed and will be required to pay the parking fine associated with that ticket.

The PEP thereby has two immediate benefits:

- reduction in curbside violations (or the illegal use of curb space for parking); and
- reduction in overtime meter violations.

Curbside violations include such violations as parking within 40 feet of intersections or in loading, bus, or no parking zones; blocking driveways, entrances, or fire hydrants; and double parking. Reducing curbside violations facilitates traffic flow, emergency and commercial delivery vehicle access, and transit operations.

A reduction in overtime meter violations, on the other hand, does not aid traffic flow or emergency or commercial vehicle access. Rather, it increases the supply of short-term parking and city parking revenues by discouraging overtime meter violations and encouraging turnover at metered spaces.

The behavior of parkers in Washington, D.C. in both commercial and residential areas has been greatly affected by increased parking enforcement. This change in individual behavior has been reflected dramatically in the changes in curbside and overtime meter violation rates. These changes are discussed below.

The data for this discussion were obtained from "before" and "after" surveys. Before the enforcement program was implemented, the Washington, D.C. Department of Transportation (D.C. DOT) conducted a survey of parking violations in several commercial and residential areas of the city. During this evaluation study, an "after" survey was conducted so that a comparison could be made. Both surveys were conducted during the midday (10:00 a.m. to 2:30 p.m.) in the central business district (CBD), non-CBD commercial areas, and two close-in residential neighborhoods. (A detailed discussion of the parking violations survey is found in Appendix A. Instructions for conducting the commercial and residential area surveys are found in Appendices B and C, respectively.)

CURBSIDE VIOLATIONS

The results of the violation survey for both the west and east CBD are shown in Table 6-1. Violation rates by type are presented for conditions before and after the enforcement program began.

The most dramatic changes have been in curbside violations. Decreases of 82 and 85 percent were recorded for the west and east CBD, respectively. A closer look at specific violations show a significant reduction in double parking (91 percent for the west CBD and 94 percent for the east CBD). This alone should help to improve traffic flow. The reduction in loading zone violations (77 and 76 percent for the west and east CBDs, respectively) should increase the availability of these zones for commercial vehicles and reduce their need to park illegally while making deliveries. Bus zone violations have also decreased from 0.39 per block face to 0.07 in the west CBD and from 0.5 to 0.08 in the east CBD. Bus operations should have improved due to this change in parking behavior. These reductions point to a significant change in violation patterns in the CBD since PEP began.

Similar results were recorded in the two close-in residential areas. Violation rates by type are shown in Table 6-2. Large reductions in vehicles parking too close to the intersection (40 feet from the intersection) should have improved sight distances for motorists and pedestrians and allowed firefighting equipment more maneuvering room around corners. Overall, total curbside violation rates were reduced by 54 percent in the Capitol Hill area and 39 percent in Adams-Morgan. Again, significant changes in violation behavior have occurred since enforcement began. The lower level of significance for the Adams-Morgan area may be more a function of smaller sample size than the lack of a reduction in violations.

A summary of two non-CBD commercial areas is shown in Table 6-3. Similar reductions in parking violations were also discovered. Georgetown is a concentrated commercial and residential area just west of the CBD that offers a wide range of specialty shops and restaurants. The commercial part of Georgetown is located primarily on the two major streets (M and Wisconsin) which intersect in the area. The second area surveyed was the strip of commercial development along Connecticut Avenue. Connecticut Avenue is a major arterial which begins in the west CBD and runs northwest through the city. Again, significant reductions in total curbside violation rates of 90 percent in Georgetown and 66 percent along Connecticut Avenue were observed.

TABLE 6-1. CBD PARKING VIOLATIONS

Violation Type	WEST CBD Violations Per Block (a) Before	WEST CBD Violations Per Block (a) After	WEST CBD Percent Change	EAST CBD Violations Per Block (b) Before	EAST CBD Violations Per Block (b) After	EAST CBD Percent Change
40 Feet from Intersection	0.45	0.05	-89	0.43	0.07	-84
Driveway	0.15	0.02	-87	0.11	0.02	-82
Loading Zone	0.22	0.05	-77	0.68	0.16	-76
Entrance	0.48	0.17	-65	0.35	0.04	-89
Bus Zone	0.39	0.07	-80	0.50	0.08	-84
Fire Hydrant	0.01	0.02	+100	0.03	0.02	-33
Double Parking	0.23	0.02	-91	0.35	0.02	-94
No Parking	1.87	0.30	-84	1.63	0.30	-82
Total Curbside Violations	3.80	0.69	-82(c)	4.07	0.70	-85(c)
Overtime Meter Violations	1.47	1.04	-29(d)	2.18	0.96	-56(c)
All Violations	5.27	1.73	-67	6.25	1.66	-73

Notes

(a) 113 and 114 block faces were surveyed before and after the program, respectively.

(b) 188 and 114 block faces were surveyed before and after the program, respectively.

(c) Reduction is significant at the 99.9 percent level.

(d) Reduction is significant at the 95.0 percent level.

Source: "Before" study conducted by D.C. DOT. "After" study conducted by Peat Marwick.

TABLE 6-2. RESIDENTIAL PARKING VIOLATIONS

	CAPITOL HILL			ADAMS-MORGAN		
	Violations Per Block (a)			Violations Per Block (b)		
Violation Type	Before	After	Percent Change	Before	After	Percent Change
40 Feet from Intersection	1.37	0.31	- 77	0.97	0.67	- 31
Driveway and Alley	0.52	0.43	- 17	0.10	0.61	510
Loading Zone	0.15	0.05	- 67	0.20	0.02	- 90
Entrance	0.13	0.03	- 77	0.37	0.10	- 73
Bus Zone	0.11	0.01	- 91	--	--	--
Fire Hydrant	0.05	0.06	20	0.03	0.02	- 33
Double Parking	0.23	0.00	-100	0.01	0.00	-100
No Parking	0.18	0.26	44	0.77	0.37	- 52
Total Curbside Violations	2.54	1.16	- 54	2.53	1.80	- 29(d)
Overtime Meter Violations	0.10	0.10	0	--	--	--
All Violations	2.64	1.26	- 52(c)	2.53	1.80	- 29(d)

Notes

(a) 94 and 77 block faces were surveyed before and after the program, respectively.

(b) 30 and 49 block faces were surveyed before and after the program, respectively.

(c) Reduction is significant at the 99.9 percent level.

(d) Reduction is significant at the 80.0 percent level.

Source: "Before" study conducted by D.C. DOT. "After" study conducted by Peat Marwick.

TABLE 6-3. NON-CBD COMMERCIAL AREA PARKING VIOLATIONS

	GEORGETOWN			CONNECTICUT AVENUE		
	Violations Per Block Face			Violations Per Block Face		
Violation Type	Before	After	Percent Change	Before	After	Percent Change
Curbside Violations	3.05	0.32(a)	90	2.50	0.84(c)	66
Overtime Meter Violations	2.03	0.64(a)	68	1.20	0.63(b)	48
All Violations	5.08	0.96	81	3.70	1.47	60
No. of Block Faces Observed	38	25	--	70	19	--

Notes:

(a) Reduction is significant at the 99.0 percent level.

(b) Reduction is significant at the 90.0 percent level.

(c) Reduction is significant at the 99.9 percent level.

Source: "Before" study conducted by D.C. DOT. "After" study conducted by Peat Marwick.

OVERTIME METER VIOLATIONS

As was found with curbside violations, the incidence of overtime meter violations declined as a result of the PEP. As shown in Table 6-1, overtime meter violations for the west and east CBD declined 29 and 56 percent, respectively. Despite the fact that these reductions were smaller than those for curbside violations, they are still substantial. (Comparable figures for all curbside violations were 82 and 85 percent for the west and east CBD, respectively.)

Large reductions in overtime meter violations also were recorded in the two non-CBD commercial areas covered by the survey. As presented in Table 6-3, overtime meter violations fell by 68 percent in Georgetown and by 48 percent along Connecticut Avenue.

Increased parking enforcement efforts had no effect on overtime meter violations in the surveyed close-in residential neighborhoods. These areas have few parking meters, and the incidence of overtime meter violations was low before implementation of the PEP.

Meter Utilization

A majority of legal spaces in commercial areas are regulated by one- or two-hour parking meters. Increased enforcement should result in the utilization of these legal spaces. The violation survey that was conducted before and after PEP began also recorded whether a metered space was vacant, occupied legally, occupied illegally without a ticket, or occupied illegally with a ticket. Of the 9,000 meters located in the CBD, approximately 16 percent were observed before the program began and 19 percent were observed after the program began.

Meter utilization for both the west and east CBD is presented in Table 6-4. As expected, the percentage of legally occupied spaces in the west CBD increased from 60.0 to 79.4, for a 32 percent increase. Illegally parked vehicles dropped from 37.0 percent to 15.4 percent with a slightly higher proportion receiving tickets. Vacancies also increased slightly. In the east CBD, the percentage of both vacancies and legally occupied spaces increased by 97 and 39 percent, respectively. The percentage of illegally occupied spaces dropped from 41.9 percent to 13.6 percent.

Similar results were found in the Georgetown and Connecticut Avenue commercial areas, as seen in Table 6-5. Legally occupied spaces increased from 51.7 percent to 78.6 percent (a 52 percent increase) in Georgetown and from 43.5 percent to 74.5 percent (a 71 percent increase) along Connecticut Avenue.

TABLE 6-4. CBD METER UTILIZATION

	West CBD		East CBD	
	Before	After	Before	After
. No. of Meters Observed	461	894	977	800
. % Vacant	3.0	5.1	9.4	18.5
. % Occupied Legally	60.0	79.4	48.7	67.9
. % Occupied Illegally without Ticket	36.0	11.6	35.0	10.0
. % Occupied Illegally with Ticket	1.0	3.8	6.9	3.6

Source: "Before" study conducted by D.C. DOT. "After" study conducted by Peat Marwick.

TABLE 6-5. NON-CBD COMMERCIAL AREA METER UTILIZATION

	Georgetown		Connecticut Ave	
	Before	After	Before	After
. No. of Meters Observed	201	117	253	141
. % Vacant	10.0	8.5	23.3	17.0
. % Occupied Legally	51.7	78.6	43.5	74.5
. % Occupied Illegally without Ticket	29.3	10.3	33.2	7.1
. % Occupied Illegally with Ticket	9.0	2.6	0.0	1.4

Source: "Before" study conducted by D.C. DOT. "After" study conducted by Peat Marwick.

On-Street Parking Turnover and Occupancy

Increased enforcement should result in higher turnover at metered parking spaces. Limited occupancy and turnover studies conducted by D.C. DOT before and after PEP support this conclusion. Table 6-6 shows the results of this study. Turnover during the four-hour midday period increased from 1.7 vehicles per space to 2.1. The amount of time spaces were vacant quadrupled from 7.5 to 30.4 percent. Meter feeding hours also increased, confirming a greater willingness to pay on the part of overtime parkers. D.C. DOT does not specifically enforce meter feeding, but the new rate of 75 cents per hour should help reduce this behavior.

Meter Revenues

The decrease in overtime meter violation rates also implies an increased willingness of parkers to pay for metered on-street parking. The increased chance of receiving a $10 ticket versus placing 75 cents in the meter for one hour of parking has resulted in higher meter revenues. A plot of monthly parking meter revenues for the FY 1978, 1979, and 1980 is found in Figure 6-1. The graph shows a steady climb in meter revenues since the program began. Much of the FY 1980 increase is due to an increase in meter rates. No rate increase occurred between 1978 and 1979. The impact of enforcement can be readily illustrated by the fact that total meter revenue in FY 1978 was approximately $2.78 million dollars, or $258 per year per meter for the slightly under 11,000 meters in Washington, D.C. During FY 1979, after enforcement began, total meter revenue rose to approximately $3.74 million, or $350 per meter, for a per-meter increase of 35 percent.

This analysis indicates that the enforcement program has been effective in reducing both curbside space and overtime meter violations in Washington, D.C. Further, the program is effectively controlling the use of legal and illegal on-street parking spaces. As shown in the previous section, the enforcement program has exceeded its production goals. With violations decreasing, this implies that the program is both effective and efficient.

TABLE 6-6. CBD MIDDAY PARKING OCCUPANCY

	Before PEP	After PEP
Percent Legal Hours Parked	46.9	46.9
Percent Meter Feeding Hours	2.4	10.8
Percent Overtime Meter Hours Parked	43.2	11.8
Percent Vacant Hours	7.5	30.4
Turnover (4 hours)	1.7	2.1

Source: D.C. DOT.

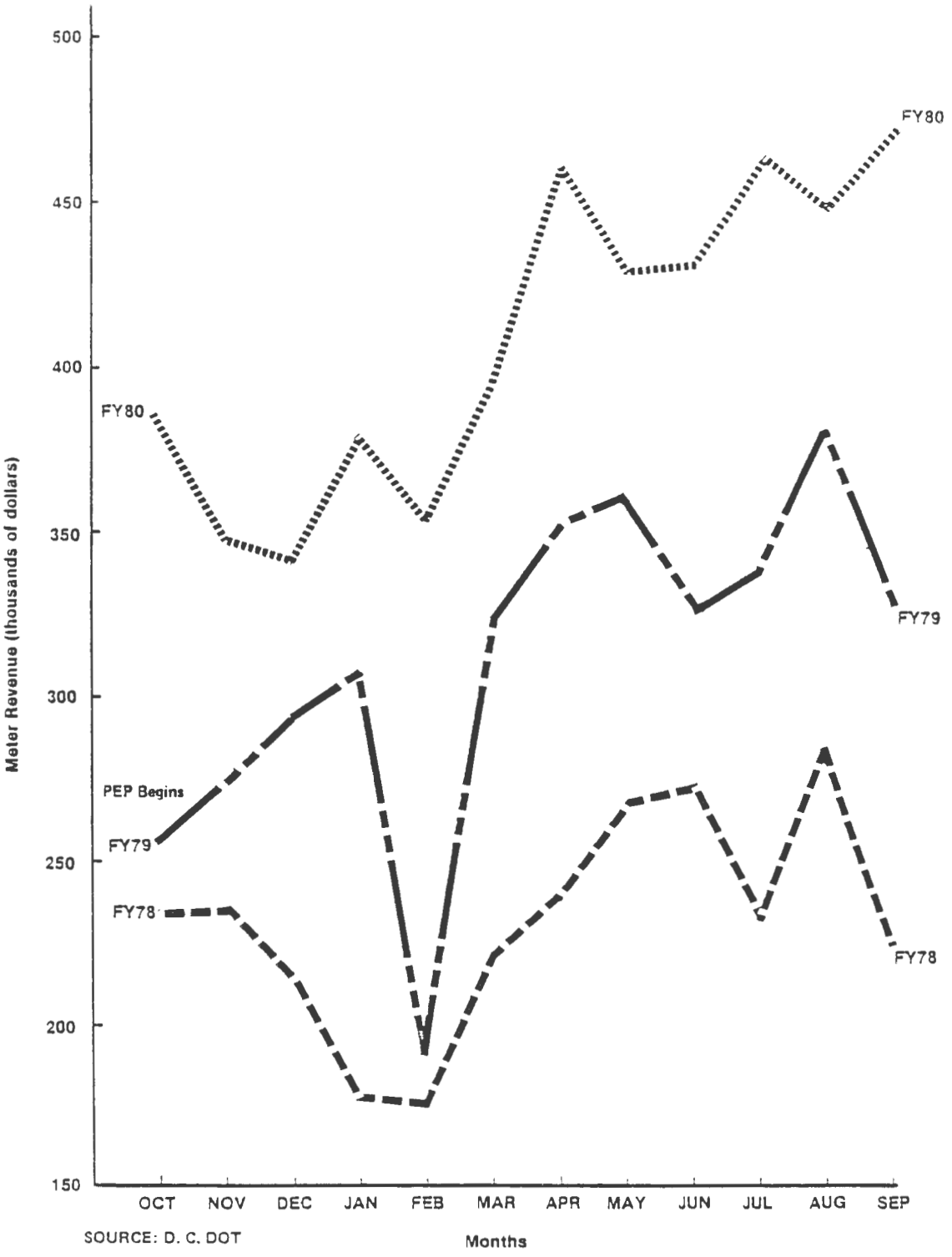

FIGURE 6-1. METER REVENUE BY MONTH

7. FINANCIAL ANALYSIS

While the primary purpose of the D.C. Department of Transportation (D.C. DOT) program is to improve the enforcement of parking regulations, the resulting increase in the number of tickets written has led to an increase in revenue for the District of Columbia. This section analyzes the financial aspects of the program.

In an effort to capture the financial implications of parking enforcement activities in Washington, D.C., an income statement for Fiscal Year 1980 has been prepared. The income statement in Table 7-1 is a summary of the previous cost tables and the income generated solely by D.C. DOT parking enforcement activities. The cost figures are subject to the assumptions described earlier. The revenue figures come from the financial management system (FMS) which is the official accounting system used by the District Government.

The total income from D.C. DOT's activities comes to approximately $13 million. Tickets account for 81.5 percent of this total. Towing and storage are responsible for another 15 percent. Total operating costs are approximately $4.6 million, which leaves a net operating income of approximately $8.5 million.

D.C. DOT is not the only agency which is involved in parking enforcement. The Metropolitan Police Department (MPD) also writes tickets and boots vehicles. Each officer is expected to write two parking tickets every day. Booting is conducted by the Special Operations Division on days when they do not have other duties. Table 7-2 shows an income statement prepared to reflect the financial impact of the MPD participation in the enforcement effort. Operating costs for MPD were assumed to be the same cost per ticket ($0.99) or for booting ($23.38) as the D.C. DOT Parking Enforcement Division.

A comparison of Tables 7-1 and 7-2 shows that MPD generated an additional $7.7 million in gross income (an increase of 59 percent) during FY 1980. Operating costs for the Bureau of Traffic Adjudication (BTA) were increased to reflect all of the Bureau's parking related costs. This cost plus the assumed operating cost for MPD increased operating costs by 35 percent to approximately $6.3 million. However, net operating income was increased by 72.5 percent from $8.5 million to $14.6 million.

This analysis indicates that parking enforcement can be fianacially profitable while improving traffic flow and safety. Once the program is in place, the marginal costs of writing an additional ticket are small and the net income gains are large. This relationship between the number of tickets written and increased

TABLE 7-1. D.C. DOT PARKING ENFORCEMENT: INCOME STATEMENT (Fiscal Year 1980)

Income (a)		
. Tickets	$10,681,284	
. Booting Fees	446,090	
. Towing Fees	1,831,290	
. Storage Fees	139,681	
Total Income		$13,098,345
Operating Costs (b)		
. Parking Enforcement Division	$ 3,504,991	
. Violation Processing Division	883,666	
. Adjudication Hearings Division	254,380	
Total Operating Cost		$ 4,643,037
Net Operating Income		$ 8,455,308

Notes:

(a) Income figures are from the District Government financial management system.

(b) Cost figures are summarized from the previous tables and are subject to the assumptions described therein.

This table has been prepared based on information provided by D.C. DOT. Peat Marwick has not verified this information. The reported cost figures are subject to the assumptions described in the text and the exhibit notes.

TABLE 7-2. ALL WASHINGTON, D.C., PARKING ENFORCEMENT ACTIVITIES: INCOME STATEMENT (Fiscal Year 1980)

Income (a)		
. Tickets	$18,361,093	
. Booting Fees	541,665	
. Towing Fees	1,831,290	
. Storage Fees	139,681	
Total Income		$20,873,729
Operating Costs		
. D.C. DOT Parking Enforcement Division (b)	$ 3,504,991	
. D.C. DOT Bureau of Traffic Adjudication (b)	1,909,471	
. MPD Parking Enforcement Activities (c)		
Total Operating Cost	869,412	
		$ 6,283,874
Net Operating Income		$14,589,855

Notes:

(a) Income figures are from the District government financial management system.

(b) Cost figures are summarized from the previous tables and are subject to the assumptions described therein.

(c) The operating cost for the Metropolitan Police Department parking enforcement activity was derived assuming the same cost per ticket and booting as D.C. DOT.

Transaction	Number of Transactions by MPD	Cost Per Transaction	Annual Operating Costs
Tickets	754,705	$ 0.99	$747,158
Bootings	5,229	23.38	122,254
			$869,412

This table has been prepared based on information provided by D.C. DOT. Peat Marwick has not verified this information. The reported cost figures are subject to the assumptions described in the text and the exhibit notes.

income should hold for a wide range of ticket volumes because most of the program costs vary directly with the number of tickets written. Approximately 78 percent of the operating costs of the ticket writing branch are for salaries and benefits. However, an upper limit should exist for the number of tickets which can effectively be written. Violators should eventually learn to park legally, and the number of violations should stabilize. There is also a trade-off between writing "good" tickets which meet the program goals of improved flow and safety and writing tickets for the sake of writing tickets. In Washington, D.C., this upper limit has not been reached.

8. IMPLICATIONS FOR OTHER AREAS

Previous sections of this report have described the operation and the impacts of the Washington, D.C. parking enforcement program (PEP). This analysis has shown how enforcement and adjudication can be used to achieve local transportation objectives. This section focuses on identifying those lessons learned from the D.C. Department of Transportation (D.C. DOT) program which are applicable to other jurisdictions contemplating the implementation of similar programs.

CHARACTERISTICS UNIQUE TO WASHINGTON, D.C.

Certain characteristics unique to Washington, D.C., should be kept in mind while reading the remainder of this section. One of the most significant is the recent opening of a new heavy rail transit system (Metrorail). The first segment opened in 1976 and currently provides service to 38 stations on a 33.6 mile network. The entire planned system will cover 101 miles. Metrorail offers an attractive alternative to automobile drivers. Thus, actions aimed at reducing automobile usage, such as increased parking enforcement, may be easier to implement in Washington than in other areas.

In most states, there is a division of responsibility between towns and the state government concerning motor vehicles. Generally, the local jurisdiction is responsible for enforcing the motor vehicle code within its borders. The state handles vehicle registration. The District of Columbia government has no such division. In fact, D.C. DOT is responsible for both parking enforcement and vehicle registration. This enables the District of Columbia to collect overdue tickets from residents at registration time. Other cities may not have the capability of denying registration for unpaid parking tickets. Further, this centralization of responsibility allows for easier coordination and policy determination.

Washington, D.C., is a relatively small city in terms of land area. The central business district land area is approximately 1.8 square miles. Further, much of the city is federal land, and most is patrolled by federal law enforcement officials. Both of these facts help to ease the logistics of parking enforcement.

ENFORCEMENT TACTICS

This subsection presents considerations for planning, implementing, and operating aggressive ticketing, towing, and booting tactics.

Planning Enforcement Tactics

Because most urban jurisdictions have some type of PEP, planning improvements or revisions to such programs commonly occurs as part of day-to-day management and operation. Planning new or revised PEPs should include the following steps:

- designating a lead agency;
- reviewing and assessing the effectiveness of the existing PEP;
- developing a public participation program;
- analyzing and evaluating the benefits and costs of such proposals; and
- securing approval to implement the program.

Each of these steps is described below.

Designation of Lead Agency

PEPs are typically the responsibility of police departments, traffic engineering departments, and, in selected settings, parking authorities. The appropriate agency or agencies to be responsible for such programs will depend upon several factors including the effectiveness and cost of the existing enforcement program, the objectives and responsibilities of affected agencies, the scope (e.g., ticketing, towing, booting) of the enforcement program, and political and institutional considerations within a jurisdiction.

To promote the integration and mutual reinforcement of enforcement tactics and other Transportation Systems Management (TSM) actions, it seems desirable to assign parking enforcement activities to the traffic engineering, transportation, or public works departments. In this type of organizational structure, enforcement programs and regulations potentially can be developed and managed from a broad transportation perspective. Programs for enforcing parking restrictions for high occupancy vehicle (HOV) lanes, Residential Parking Permit Program (RPPP) areas, commercial shopping areas, and other problems should be developed, directed and implemented by a single agency rather than by multiple agencies.

The design, implementation, and operation of aggressive ticketing, towing, and booting programs, particularly those involving on-line computer information systems and dispatching and communication systems, are likely to be major undertakings. Again, although many agencies may be involved, a single agency should be responsible for

the program. In addition, adequate staffing and budget should be made available to perform the authorized planning.

In Washington, D.C., authority for parking enforcement was concentrated in D.C. DOT, which also had responsibility for the administration of driver permits, vehicle registration, traffic violations, and traffic adjudication. These new administrative areas, coupled with D.C. DOT existing transportation engineering functions, placed almost all aspects of motor vehicle operation under the control of one agency. This centralization resulted in the easier implementation of integrated TSM programs.

It should be noted that the designation of a lead agency does not preclude involvement of other agencies (e.g., planning departments, institutions, police, economic development departments, metropolitan police departments (MPDs), transit authorities, air quality agencies) in the planning of enforcement tactics to further local objectives. For example, D.C. DOT developed its program in close coordination with the MPD and the Traffic Court. Unless such agencies are consulted, their concerns could impede the implementation of such tactics.

Assessment of Existing Enforcement Program

A basic requirement before instituting major changes or expansions in a PEP is identifying the types, severity, and locations of parking enforcement problems within a jurisdiction and the effectiveness of the existing enforcement program in addressing these problems. The types of issues and data that should be considered in this regard are illustrated in Table 8-1. If a comprehensive PEP is under consideration, information on illegal parking, scofflaws, program costs and revenues, and staffing should be analyzed. In the District, all four issues were addressed.

As shown in Table 8-2, much of the information needed in such an analysis is likely to be available from agency records and budgets. Compiling such data should not be a problem for those agencies with up-to-date manual or computer information systems. However, it is likely that some type of field investigations will be necessary to determine the severity of illegal parking problems. Many agencies may not have current and/or readily accessible data of this type on a geographic basis. The number of tickets issued does not necessarily indicate the severity of the illegal parking problem. Usage surveys and possible parking supply inventories may be needed to obtain information on factors such as parking turnover; illegal parking in loading zones, crosswalks, and at fire hydrants; and meter violations.

TABLE 8-1. APPLICABLE DATA FOR ASSESSING ENFORCEMENT AND ADJUDICATION TACTICS

Potential Actions	Number, Types and Locations of Parking Violations	Characteristics of Scofflaw Problem	Operating Characteristics of Existing Enforcement Program	Operating Characteristics of Adjudication Process
1. Reduce Illegal Parking				
– Parking Violations	X		X	X
– Impeding Traffic During Peak Hours	X		X	X
2. Increase Apprehension of Scofflaws	X	X	X	X
3. Reduce Operating Costs and/or Increase Revenues				
– Enforcement	X	X	X	
– Adjudication	X	X		X
4. "Free-up" Police for Other Duties	X		X	

TABLE 8-2. POTENTIAL SOURCES OF DATA FOR PLANNING ENFORCEMENT AND ADJUDICATION TACTICS

Applicable Data for Assessment	Potential Sources of Data
1. Number, Types, and Locations of Parking Violations	Records from Enforcement Agency (e.g., Police, DOT, Parking Authority) Usage Surveys and Parking Inventories
2. Characteristics of Scofflaw Problem – Number – Distribution of Scofflaws by Number of Citations – Value of Unpaid Citations	Records from Enforcement and Adjudication Agencies
3. Operating and Financial Characteristics of Enforcement Program – Responsible Agency – Enforcement Practices (e.g., routes, frequency) – Types of Activities Performed (e.g., Ticketing, Towing, Booting) – Staffing and Organization – Operating Costs and Revenues	Records and Budgets of Enforcement Agency
4. Operating and Financial Characteristics of Adjudication Program – Responsible Agency – Adjudication Practices – Cases Processed – Staffing and Organization – Operating Costs and Revenues	Records and Budgets of Adjudication Agency

D.C. DOT was able to use its parking meter turnover studies to assess problems in commercial areas. These studies, originally used to monitor meter revenue, revealed the amount of lost revenue due to illegal parking. D.C. DOT also monitored the effectiveness of its residential parking permit programs. A special violation study was performed to determine the extent and nature of illegal parking in both commercial and residential areas. This study, which was discussed in Section 5, showed the number and types of violations. It also provided a sound basis both for determining the types of transportation and safety problems caused by illegal parking and for developing appropriate enforcement solutions.

The finding of the analysis should provide a basis for deciding if changes to the existing enforcement program and/or new enforcement programs are needed. It is highly advisable that the findings of this analysis be documented for review by elected officials, department administrators, and interested citizens, businesses, and other agencies. D.C. DOT, in conjunction with the MPD and the D.C. Office of Corporation Counsel, merged their analysis into the proposal for the new enforcement program. This document* was a very effective means of demonstrating the problem and presenting a potential solution.

Public Participation

As with most new programs, public participation is an important element of planning, implementing, and operating an effective PEP. Because parking enforcement regulations apply to virtually all vehicles, a large number of interests is likely to be concerned by such regulations. The major interest groups are:

- residents;
- business community;
- government agencies; and
- non-residents.

Some of these groups will be concerned about parking and regulations within specific geographic subareas such as residential and commercial areas. Other interests, such as government agencies,

* District of Columbia Department of Transportation, Improved Parking and Traffic Enforcement in the District of Columbia, April 1977.

the motor carrier industry, and the Chamber of Commerce, may have broader concerns about the citywide or areawide impacts of such programs.

Working with these groups can provide valuable input to the project by identifying actual and perceived parking problems, their transportation, economic, and environmental impacts, and potential solutions. Without the input and support of these interest groups, the Washington, D.C., program would not have been implemented.

Analysis and Evaluation of Enforcement Tactics

In order to analyze and evaluate enforcement tactics, it will be necessary to:

- define the characteristics of the tactics;
- specify the types of impacts/issues of concern in the evaluation; and
- select and apply procedures for estimating the impacts.

These requirements are discussed below.

Define Characteristics of Tactics. Based on the findings of the evaluation of the PEP, the affected jurisdictions may decide to change selected elements of the PEP or to develop a more comprehensive enforcement program possibly including towing, booting, and new forms of adjudication. It is particularly important that the enforcement requirements of on-street supply tactics (e.g., RPPPs, HOV on-street parking), pricing tactics, and fringe and corridor parking tactics be considered in assessing the requirements and scope of the parking enforcement program.

An important concern in this effort is deciding whether towing and booting programs should be implemented within a jurisdiction. There are several major reasons for implementing towing and/or booting programs. If a jurisdiction has a large number of scofflaws that cannot be apprehended through actions such as screening applications for annual vehicle registration, then it may need to tow or boot scofflaw vehicles to enforce parking regulations and particularly to secure payment for past parking violations.

Since the District of Columbia is a self-contained governmental unit, annual vehicle registration provides the District government with the opportunity to catch outstanding violators

who are residents. Non-resident scofflaws are easily identified by their license plates. This has allowed D.C. DOT to concentrate on non-residents and thus utilize their booting efforts more effectively.

Towing programs also provide an important method for clearing illegally parked vehicles from streets with peak period parking restrictions and from reserved lanes for buses and other HOVs. It should be noted that scofflaw vehicles identified on streets with peak hour parking restrictions should not be booted, as such immobilized vehicles will block traffic. Thus, both towing and booting may be necessary if an aggressive scofflaw apprehension program is under consideration.

It is advisable to identify alternative enforcement programs to determine which programs are likely to be most cost-effective. In order to make such comparisons, alternative enforcement programs should be defined in terms of factors shown in Table 8-3.

The specific characteristics of an enforcement program should be identified in the public participation program based on the types of parking problems found in the jurisdiction.

Specify Issues and Impacts of Interests. An important step in planning changes to existing enforcement programs or new enforcement programs is identifying the types of impacts that should be evaluated. Section 1 of this report presented a conceptual framework for assessing the effects of a PEP on the existing transportation system. Enforcement program costs and productivity should also be analyzed.

Select and Apply Analysis Procedures. Highly complex technical procedures are not necessary to estimate the impacts of alternative PEPs. Probably the most critical requirement is for the analyst to have a thorough understanding of how the programs are expected to work so that he/she can estimate realistic equipment and staffing requirements, implementation costs, operating costs, and program effectiveness measures. The information on the D.C. DOT program contained in the previous sections can serve as a guide for developing meaningful impact, cost, and revenue estimates.

Approval Process

The process of approving revised and/or new PEPs will depend on the decision-making process within each jurisdiction and urban area. Potential sources of controversy in the decision-

TABLE 8-3. FACTORS FOR DEFINING ENFORCEMENT PROGRAMS

- Responsible Agency
- Staffing Levels
- Geographic Areas of Coverage
- Levels of Enforcement
  - Frequency of Patrols
  - Number of Citations, Tows, and Bootings to be Accomplished.
- Enforcement Methods
  - Ticketing
  - Towing
  - Booting
- Fines
  - Ticketing
  - Towing
  - Booting
- Need for Contractor Support (e.g., for towing)
- Method for Recovering a Towed or Booted Vehicle
- Equipment Requirements
  - Communication Equipment and System (e.g., CB)
  - On line Computerized Information System
  - Tow Truck Dispatching System
  - Storage Area for Towed Vehicles
  - Patrol Vehicles for Ticket Writers
  - Cranes for Towing
- Facility Requirements
  - Impoundment Lots
  - Office space for Supervisors, Staff and Equipment

making process include interagency control of the enforcement program and the stringency and impacts of parking regulations and fines on residents and commuters. If the impacts of the program are estimated at a meaningful level of detail, the impact analysis should aid the decision-makers in selecting a politically acceptable enforcement program.

The decision-making process should determine the types of enforcement in programs that are to be implemented, the agency (ies) responsible for the program, and the geographic area for which program should be operated.

Implementing Enforcement Tactics

The implementation of a comprehensive enforcement program can be a major undertaking, particularly if it incorporates towing and booting tactics. Important activities that may be performed include:

- developing detailed requirements, specifications, etc., for staffing, towing and booting equipment, physical facilities (e.g., impoundment lots), and communication and information system equipment;
- determining an implementation schedule;
- defining and documenting management, administrative, and operating procedures to be followed in the program;
- drafting and securing passage of enabling legislation;
- developing requests for proposals, bid documents, etc., for procuring contractor services;
- developing staff training program;
- preparing and distributing information to the public on the operation of the towing program; and
- identifying sources of funds for implementing and operating the program.

Some of these issues are considered below.

Develop Program Requirements

Table 8-3 lists the many personnel and equipment requirements

for implementing a comprehensive PEP. If the enforcement program is limited to aggressive ticketing, the principal requirements will be staffing, designation of regular enforcement routes, frequencies, etc., and a management information system to monitor the number of tickets issued by parking control aides and geographic area as well as to identify scofflaws if this is of concern to the jurisdiction. In many instances, relatively simple software and supporting administrative procedures can be developed to implement the information system. Clearly, an agency must assess, on a case-by-case basis, whether its ticketing program is sufficiently large to warrant the need for such a system.

The decision to implement a towing and/or booting program increases the staffing, equipment, and physical facility requirements for an enforcement program. The enforcement program implemented by the D.C. DOT provides a useful example of how ticketing, towing, and booting programs can be integrated and the associated staffing, equipment, and facility requirements of such tactics.

Based on the Washington example, the integration of ticketing, towing, and booting operations typically requires that:

- all parking control aides (PCAs) have two-way radios to request towing equipment;
- some PCAs have vehicles to reach patrol areas (e.g., commercial areas or RPPP areas) throughout the city;
- a communications system be established to identify vehicles to be towed;
- an on-line information system be established to identify vehicles that have been towed or booted, their impoundment/booted locations, the outstanding citations and fines on the vehicles, and their status with respect to paying all fines and charges;
- impoundment lots and associated security provisions be developed;
- cranes for towing be acquired/rented and maintenance and storage facilities be provided; and
- existing parking restrictions be reviewed for consistency and relevance to current conditions.

The number of PCAs, patrol vehicles, cranes, and boots, the size of impoundment lots and other facilities, and the data management requirements of the information system will depend upon the enforcement program in each jurisdiction.

Develop Management and Administration and Operating Procedures

The success and political acceptability of an aggressive enforcement program, particularly a program involving towing and booting, will be heavily dependent on the equitable and reliable operation of the program. Although programs as complex as Washington's inevitably will have some start-up problems and periodic problems with erroneous towing and booting, it is essential that such problems be kept to a minimum and corrected immediately. This clearly requires that carefully structured management, administrative, and operating procedures be documented, communicated to the staff, and enforced on a continuing basis. A number of key issues in this regard are discussed below.

Staff Training. The importance of a thorough training program for program supervisors, PCAs, crane operators, dispatchers, booting personnel, impoundment lot personnel, and others involved in the enforcement program cannot be overstated. Many of these individuals will have extensive contact with angry vehicle owners and should have a clear understanding of how to handle both routine and unique situations. Erroneous or inconsistent applications of enforcement regulations, discourteous treatment of the public, or deliberate neglect of standard operating requirements (e.g., in securing impounded vehicle) can quickly undermine the credibility and support of the enforcement program.

Vehicle Security. Particularly sensitive issues when vehicles are being towed and impounded are preventing damage to the exterior of the vehicle and securing contents of the interior of the vehicle. Each of these concerns is affected by the methods used to tow and protect impounded vehicles. It is highly advisable to develop procedures for recording the physical condition of vehicles which are towed and impounded. The form used by D.C. DOT serves as both a record of a vehicle's being towed as well as a description of the physical condition of the vehicle.

Protecting the interior contents of towed vehicles is a very serious issue. The methods used to tow vehicles greatly affect how this can be accomplished. In some towing operations,

crane operators are allowed to enter a vehicle to facilitate the towing operation while in others crane operators are explicitly prohibited from entering a vehicle. The D.C. DOT system is an example of the latter operation, where the cranes used enable the operator to perform all towing operations from outside the vehicle. It is also necessary to secure vehicles while they are on the impoundment lot. This requires providing the necessary fencing, lighting, and, as required, security personnel at the lots. The contents of towed vehicles can be further protected by "sealing" vehicles when they arrive on the impoundment lot, as is done in Washington.

Procedures for Returning Vehicles. The procedures established for returning impounded or booted vehicles should be carefully developed. Basic questions to be addressed include:

- the use of centralized or decentralized (i.e., at impoundment) cashier facilities for paying outstanding fines and costs and the necessary fiscal controls on such operations;
- type of evidence (e.g., vehicle registration) needed to establish vehicle ownership before releasing the vehicle;
- time periods during which vehicles can be obtained from the impoundment lot;
- need for a daily storage charge at the impoundment lot; and
- procedures for processing damage or other claims against the jurisdiction.

The appropriate method for addressing each of these issues will depend on the specific characteristics of each jurisdiction's enforcement program.

Use of Contractor Services

A number of options are available to jurisdictions for operating their towing and booting programs. These options include using public employees, private contractors, or a combination of both. Washington, D.C.,has contracted out its towing operations which has resulted in cost savings to the jurisdiction. This approach may also enable a jurisdiction to minimize start-up capital costs for cranes, communication equipment, and maintenance facilities by acquiring such services from contractors.

The advantages and disadvantages of this approach must be considered on a case by case basis. Under certain circumstances, it may be advantageous for a jurisdiction to consider the option of using private contractors.

Develop Public Information Program

When implementing major changes to an existing enforcement program or totally new enforcement activities, it is essential to advise the public of such developments. Such a public information program is particularly critical if towing and booting are part of the enforcement program. Radio, television, and newspaper coverage should be arranged and flyers, posters, and other mechanisms used to inform the public of the requirements of the enforcement program.

The requirements of the public information program include:

- the parking rules and regulations of the jurisdiction;
- the fines and other penalties (e.g., towing, booting) associated with parking violations;
- methods for responding to a parking ticket including contact agencies and address, hours for hearing, amount and method of payment, etc.; and
- necessary steps to recover a vehicle that has been towed or booted including contact agency and address, hours for payment of fines and retrieving vehicles, location of impoundment lots, form of payment (e.g., cash, certified checks, credit card).

The District of Columbia prepared a brochure such as that described above.* This document included a detailed map showing the locations for paying fines and other costs and impoundment lots in relation to the subway lines and stations serving the city.

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* District of Columbia Department of Transportation. District of Columbia Parking Enforcement Program, Washington, D.C., 1978.

Identify Sources of Funds

The capital and operating costs of the enforcement program typically must come from local sources; however, the U.S. DOT, Comprehensive TSM Program provides $15 million of discretionary funds to stimulate wider implementation of comprehensive TSM programs and projects.* Parking management tactics including enforcement are cited as examples of eligible project elements. If an improved PEP was one element of a more comprehensive TSM program, the TSM program and thus the enforcement program might be eligible for these funds.

The problem of securing approval of start-up and operating costs for comprehensive enforcement programs may be partially solved in another manner. Appropriate administrators and elected officials can be shown that these costs will be covered by parking enforcement revenues. The D.C. DOT program produced net revenues of approximately $8 million in FY 1980.

ADJUDICATION TACTICS

Adjudication refers to the legal process for conducting hearings on contested cases involving traffic and parking violations. There are two methods of adjudication: judicial and administrative. The judicial adjudication system is administered by the courts, commonly the criminal courts, while the administrative adjudication system is administered by a traffic department or other non-judicial agency. Many legal, institutional and political factors must be considered in assessing the desirability of transferring the adjudication from the courts to a non-judicial agency. Such factors include:

- the existence of legal powers for establishing an administrative adjudication program or support for passing such legislation;
- the caseload demand, particularly the traffic and parking caseload, on the court system;
- the average elapsed time for holding a hearing on traffic and parking cases;

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* Federal Register, Vol. 45, No. 232, December 1, 1980, p. 79662.

- the cost and staff resources of the judicial system devoted to traffic and parking cases;

- the cost and staff resources of the police department required for court hearings on traffic and parking cases;

- the "observed" effectiveness of the adjudication program for discouraging and apprehending scofflaws; and

- the likely costs, effectiveness, and operating characteristics of possible administrative adjudication systems.

A useful step in analyzing the advantages and disadvantages of administrative adjudication is to review the operation of implemented programs.

Jurisdictions such as New York City, Buffalo, Rochester, the State of Rhode Island, and Washington, D.C. have implemented administrative adjudication systems. Benefits of such systems include:*

- quickly hearing and deciding cases involving traffic and parking tickets;

- significantly reducing the average length of wait time from several hours to 20 to 40 minutes for citizens appearing for hearings;

- reducing judge and prosecutor caseloads and enabling them to concentrate their efforts on criminal cases;

- reducing the need for court appearances by police officers;

- greatly reducing the ability of parking scofflaws to avoid apprehension; and

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* District of Columbia Department of Transportation. Improved Parking and Traffic Enforcement in the District of Columbia, April, 1977.

- eliminating the criminal stigma associated with hearings on parking violations.

In a study of its judicial adjudication system, D.C. DOT found many deficiencies including:

- an unmanageable volume of cases;
- long delays between issuing tickets and adjudication;
- lengthy waits for citizens appearing in court;
- judge shopping and inconsistent sentences;
- wasted man-hours and unnecessary appearances for police officers as well as problems of notifying affected police officers of upcoming court cases; and
- lengthy lag-time between non-payment of a ticket and issuance of a warrant for non-payment.

In order to compare both types of adjudication and to gain necessary political and institutional support for administrative adjudication, it is important for all agencies involved in and affected by the program to participate in the analysis. This typically would include:

- elected officials;
- representatives of the judicial system;
- police department;
- the jurisdiction's legal counsel;
- the traffic department or DOT;
- community leaders; and
- public interest groups concerned with protecting the legal rights of citizens.

The latter groups should be involved to ensure that citizens' legal rights will not be violated in the adjudication process and that appropriate legal mechanisms exist for appealing decisions, fines, etc.

At a minimum the planning phase for an administrative adjudication system should determine:

- the existence of or need to secure enabling legislation for such a system;
- the agency to be responsible for the system;
- the types of parking and traffic offenses to be covered in the system; and
- the major components of the system including ticket processing, hearing processing, options for appeals, enforcement of penalties, and driver rehabilitation for traffic offenses.

Many issues must be resolved in order to implement an effective administrative adjudication system. These include:

- defining parking and other (e.g., traffic) violations to be handled and all operations to be performed under the system;
- estimating the caseload on the system as a function of the characteristics of the enforcement program;
- developing an organization plan and corresponding staffing and training requirements;
- developing management, administrative, and operating procedures for the program;
- designing and implementing a management information system to support the adjudication process and to integrate the enforcement and adjudication functions;
- estimating the start-up and operating costs and revenues for the program;
- developing a detailed schedule for implementing the adjudication system; and
- developing materials for familiarizing citizens with the workings of the system.

Many of the above steps are self-explanatory. However, several warrant further discussion. A basic system characteristic is identified by the types of parking and other (e.g., traffic) violations that will be handled in the administrative adjudication process as opposed to the courts. Serious traffic (e.g., driving while intoxicated, reckless driving) and parking (e.g., scofflaw) violations would likely be handled by the criminal courts while routine, less serious violations would be the responsibility of the adjudication system.

The characteristics of a jurisdiction's enforcement program should be accounted for in estimating caseload staffing. For example, the implementation of an aggressive ticketing, towing, and booting program is likely to generate a substantial increase in tickets and adjudication hearings over that for the existing enforcement program.

APPENDIX A

PARKING VIOLATIONS SURVEY

Before the parking enforcement program (PEP) was implemented, the District of Columbia Department of Transportation (D.C. DOT) conducted a survey of parking violations in commercial areas and residential neighborhoods.* The purpose of this survey was to determine the extent and nature of illegal parking in Washington, D.C. During the evaluation study, a similar survey was conducted, again in selected areas. Thus, a comparison could be made between parking violation rates before and after the PEP was implemented.

METHODOLOGY

In order to ensure compatibility with the previous survey, discussions were held with D.C. DOT personnel concerning the methodology employed in the previous survey. Based upon these discussions, survey procedures were developed for both commercial areas and residential neighborhoods. Separate procedures were required for commercial areas to account for parking meter violations.

The survey basically consisted of having a person walk along assigned streets and count the number of parking violations. Each day the surveyor was given a map with a route to follow. Each route consisted of 30 to 50 block faces. Before starting the survey, the surveyor was trained to identify various parking violations and to record the number of violations per block face on the survey form.

The instructions for conducting the commercial area and residential area violation surveys are found in Appendices B and C, respectively. The instructions include definitions of the various parking violations, special instructions, and sample survey forms. The definitions of parking violations are the same as those used in the "before" study.

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* Improved Parking and Traffic Enforcement in the District of Columbia, prepared by the Metropolitan Police Department, Office of the Corporation Counsel and D.C. Department of Transportation, April 1977.

There are two types of commercial areas within Washington, D.C.: (1) the Central Business District, (CBD), and (2) neighborhood shopping districts. Because most of the enforcement effort has been focused in the CBD, the east and west CBD were surveyed. To assess the effect of enforcement, two neighborhood shopping districts were chosen: the Georgetown and Connecticut Avenue areas. Not all the areas surveyed in the "before" study were surveyed in the "after" study because of budget constraints. However, those commercial areas selected account for 72 percent of the block faces surveyed in the "before" survey.

Two residential areas were selected to be surveyed--Capitol Hill and Adams-Morgan. Both are close-in neighborhoods with implemented residential parking permit programs. These areas were surveyed in the "before" study and were determined to be representative of other neighborhoods in the city. These selected areas account for 42 percent of the block faces surveyed in the "before" study.

The actual block faces surveyed in both residential and commercial areas were chosen as representative of land use and enforcement level. The routes taken by the surveyors cross parking control aide (PCA) beats and land use patterns in an attempt to yield an estimate of the average number of parking violations per block for each of the chosen areas.

The actual survey was conducted over a two-week period from September 30 to October 9, 1980. Data were collected only on Tuesdays, Wednesdays, and Thursdays. In order to miss peak-period parking restrictions and to measure violation behavior during peak parking accumulations, data were collected only between 10:30 a.m. and 2:30 p.m.

RESULTS

The tabulations of the survey results for the commercial and residential areas are found in Tables A-1 and A-2, respectively. Overall data from 291 block faces in commercial areas and from 126 block faces in residential areas were used in the analysis. Blocks with all-day parking restrictions were excluded from the tabulations, as were block faces which were the scene of extensive construction.

The statistical results for the four commercial areas are shown in Table A-3. The table presents the sample size, mean, and standard deviation for the "before" and "after" case. Data for meter violations and curbside violations are presented.

TABLE A-1. D.C. PARKING VIOLATIONS SURVEY OF COMMERCIAL AREAS: TABULATIONS

AREA	PARKING METERS						CURBSIDE VIOLATIONS											Comments
	Vacant	Occupied Legal	Violation No Ticket	Violation w/Ticket	Standing	Total Meter Violation	40' From Intersection	Driveway	Loading Zone	Entrance	Bus Zone	Hydrant	Double Park	No Parking	Tickets Issued	Standing	Total Non-meter Violation	
East CBD	148	498	80	29	45	109	8	2	18	5	9	2	2	34	9	66	80	114 block faces surveyed
West CBD	46	697	104	34	13	138	7	3	6	23	9	2	2	40	12	96	92	133 block faces surveyed
Georgetown	10	91	12	4	1	16	0	0	5	1	0	0	0	2	0	5	8	25 block faces surveyed
Connecticut Avenue	24	102	10	2	3	12	6	0	5	1	2	0	0	2	0	3	16	19 block faces surveyed
Time:																		
Total	228	1388	206	69	62	275	21	5	34	30	20	4	4	78	21	170	196	291 block faces

TABLE A-2 D.C. PARKING VIOLATION SURVEY OF RESIDENTIAL AREA: TABULATIONS

	CURBSIDE VIOLATIONS												
	Meters	40' From Intersection	Driveway and Alley	Loading Zone	Entrance	Bus Zone	Hydrant	Double Parking	No Parking/ Standing	Tickets Issued	Standing	Total Violations	Comments
Capital Hill	8	24	33	4	2	1	5	0	20	9	8	97	77 block faces surveyed
Adams-Morgan	0	33	30	1	5	0	1	0	18	9	6	88	49 block faces surveyed
Total	8	57	63	5	7	1	6	0	38	18	14	185	126 block faces

TABLE A-3. COMMERCIAL AREA PARKING VIOLATION SURVEY STATISTICAL RESULTS

Statistic	East CBD		West CBD		Georgetown		Connecticut Ave.	
	Before	After	Before	After	Before	After	Before	After
Sample Site (n)	188	114	116	133	38	25	70	19
Mean ($\bar{x}$)	2.176	0.956	1.466	1.038	2.026	0.640	1.200	0.632
Standard Deviation(s)	3.109	1.366	1.867	1.322	2.871	0.907	1.922	1.012
t Statistic	4.671		2.051		2.734		1.709	
Level of Significance	99.9%		95.0%		99.0%		99.0%	

Curbside Violations Per Block Face

Statistic	East CBD		West CBD		Georgetown		Connecticut Ave.	
	Before	After	Before	After	Before	After	Before	After
Sample Site (n)	188	114	116	133	38	25	70	19
Mean ($\bar{x}$)	4.069	0.702	3.802	0.692	3.053	0.320	2.500	0.842
Standard Deviation(s)	6.017	1.038	5.091	1.143	5.982	0.627	3.322	1.119
t Statistic	7.470		6.411		2.755		3.461	
Level of Significance	99.9%		99.9%		99.0%		99.9%	

The original data for the "before" data are not available. Thus it was assumed that the standard deviation for the "before" data was equal to the ratio of the "before" mean to the "after" mean times the standard deviation of the "after" data. This conservative assumption assumes that the standard deviation grows with the mean.

The statistical procedure* for testing the difference between two means was used to determine if any statistically significant change had occurred. The resulting statistic and level of significance is reported in the table.

The table reveals that a significant reduction in both parking meter and curbside violations per block face occurred in both sections of the CBD. Curbside violations had the largest reduction. Similar reductions in violation rates are found in the two non-CBD commercial areas. The lower level of significance for meter violations along Connecticut Avenue may be more a function of sample size than the lack of a reduction in violations. Additional analysis of the survey is found in Section 6 of this report.

Table A-4 reports the statistics for the residential areas. The same assumptions concerning the "before" data standard deviation were made. The same statistical procedures were applied. Again the lower level of significance for Adams-Morgan may be more a function of a smaller sample size than the lack of reduction in violations.

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* Hubert M. Blalock, Jr., Social Statistics, (New York: McGraw-Hill Book Company, 1972), p. 226.

TABLE A-4. RESIDENTIAL AREA PARKING VIOLATION SURVEY:

Statistic	Capitol Hill		Adams-Morgan	
	Before	After	Before	After
Sample Site (n)	94	77	30	49
Mean ($\bar{x}$)	2.638	1.260	2.533	1.796
Standard Deviation(s)	3.536	1.689	2.192	1.554
t Statistic	3.323		1.527	
Level of Significance	99.9%		80.0%	

Appendix B

INSTRUCTIONS FOR CONDUCTING COMMERCIAL AREA PARKING VIOLATION SURVEY

PURPOSE OF SURVEY

Peat, Marwick, Mitchell & Co. (PMM&Co.) has been engaged by the U.S. Department of Transportation to evaluate the District of Columbia new parking enforcement program. The enforcement program includes the use of approximately 50 civilian ticket writers, the immobilization of vehicles with four or more parking tickets through the use of "Denver" boots, and towing specific parking violators, particularly vehicles parked on rush hour restricted streets. As part of this evaluation, this survey of commercial area parking violations is being conducted to be compared with the results of a previous similar survey.

SURVEY PROCEDURE

The survey basically consists of walking along assigned streets and counting the number of parking violations. The number and type of parking violation will be recorded on survey forms which will be provided.

Starting the Survey Day

Survey data is to be collected between 10:30 a.m. and 2:30 p.m. on Tuesdays, Wednesdays, and Thursdays. In order to have enough time to pick up your survey materials and travel to the survey starting point, surveyors must arrive at PMM&Co's. offices by 10:00 a.m. Here, each survey on will be given a survey route and sufficient survey forms for that day.

Survey Route

Each day the surveyor will be given a map with the route the surveyor is to follow. A sample is attached. The map will also indicate which side of the street will be surveyed. Each route will consist of 30 to 50 blocks.

Survey Form

A sample of a completed survey form is attached. A description of the information to be written in each section is discussed below.

Upper Right Hand Corner

In the upper right hand corner of the survey form, the surveyor is to consecutively number each page he/she uses during the day. There is also space for the surveyor's initials and the date.

Block

At the start of each block along the survey route, the surveyor looks in the column under the work, 'BLOCK' for:

- the street name and boundaries;
- the side of the street being surveyed; and should write
- the time that the survey of the block begins

For example, if the side of the street where Peat, Marwick, Mitchell & Co. is located was being surveyed at 11:00 a.m., the surveyor would have on the form: K St., 19th St. to 20th St., south side, 11:00 a.m. Each side of each block or block face being surveyed is to be recorded as a separate row on the survey form.

Parking Meters

The section on parking meters will be filled in only if there are parking meters on the particular block face being surveyed. There are five possible conditions which the surveyor must look for when he/she encounters a parking space with a parking meter. The five possible conditions are:

- Vacant: There is not a vehicle parked in the metered parking space.
- Occupied Legal: There is a vehicle parked in the metered parking space and the red violation flag is not showing.
- Violation - No Ticket: There is a vehicle parked in the metered parking space and the red violation flag is showing but a parking ticket has not been issued.
- Violation with Ticket: There is a vehicle parked in the metered parking space, the red violation flag is showing, and a parking ticket has been issued.
- Standing: Whenever there is someone waiting in a vehicle parked in a metered space, the vehicle is considered to be standing and not parked.

For each parking space with a parking meter, the surveyor is to determine which condition exists and make a tally mark under the correct heading on the survey form.

Curbside Violations

The section on curbside violations will be used to record selected parking violations and also the number of parking tickets issued for these violations. The surveyor will be required to look for any of these violations as he/she surveys each block face. A definition of these selected violations is given below:

- 40' From Intersection: It is illegal for any vehicle to park less than 40 feet from a street corner. Usually there will be a sign that reads, "No Parking, Here to Corner." Any vehicle parked between the sign and the corner is in violation of the 40 feet from intersection rule. If no such sign exists, then the distance can be estimated by counting the number of sidewalk squares from the corner to the first vehicle. A sidewalk square is usually 3 feet long. Therefore, 13 squares is about 40 feet. Any vehicle parked next to the first 13 squares would be in violation of the rule. However, the posted signs always take preference over the distance from the corner.

- Driveway: No vehicle may be parked in front of or within 5 feet of a driveway.

- Loading Zone: A loading zone is a parking space reserved for the use of commercial vehicles during loading and unloading of materials. All loading zones are marked with signs that read "No Parking, Loading Zone" and then list the time and days for which the restriciton applies. A commercial vehicle is any motor vehicle designed, used or maintained primarily for the transportation of goods and materials. Any non-commercial vehicle parked in a loading zone is in violation of this rule.

- Entrance: Parking can be prohibited at the entrance of a building. If parking is prohibited, it is marked with signs which read "No Parking, Entrance." Some signs will also list the times and days for which the restriction applies. It is illegal for any vehicle to park in an area marked with these signs.

- Bus Zone: Bus zones are marked by signs which read "No Parking, METRO Bus Zone" or "No Standing METRO Bus Zone." It is illegal for any vehicle to park in a bus zone.

- Hydrant: Parking is not permitted within 10 feet of either side of a fire hydrant.

- Double Park: It is illegal to park a vehicle in the traveled roadway next to a parked car.

- No Parking: The last type of violation to be counted involves the prohibiting of parking a vehicle between signs which read "No Parking Anytime," or "No Parking" at specified times. This type of violation does not include any violation described above, specifically:

  . 40' from Intersection;

  . Loading Zone;

. Entrance; and

. Bus Zone.

This violation does include emergency no parking restrictions except at construction sites.

As the surveyor walks along the block, he/she is to determine if any of the parked vehicles has committed any of the violations described above. It is important to read all the parking restriction signs before recording a violation to make sure that the violation has taken place. A tally mark is to be made under the appropriate heading for every violations which occurs. It is possible for a vehicle to be in violation of two or more rules. Each violation is to be recorded, unless there is someone waiting in the vehicle. The vehicle is then considered to be standing and not parking, and a tally mark should be made in the column marked, "Standing."

The last box under curbside violations is for recording the number of parking tickets issued for the violations which were discovered by the surveyor. If the surveyor determines that one of the above specified violations has occured and a parking ticket has been issued for this violation, a tally mark is to be placed under the heading "Tickets Issued." Tickets for parking meter violations are not to be recorded here.

Comments

The last column on the survey form is to record any unusual circumstances or conditions which exist on the block being surveyed. Specific examples to be recorded include:

- building construction;
- street repairs;
- covered or broken parking meters;
- traffic accidents which block the street; and
- parades or demonstrations.

The comments should be detailed, and the parts of the block affected should be noted.

ADDITIONAL INSTRUCTIONS

Commercial Vehicles

Commercial vehicles is any motor vehicle designed, used or maintained primarily for the transportation of goods and materials. Generally such vehicles will be marked with the company name or display a sign behind the

vehicle's windshield. During a delivery or pick-up, commercial vehicles are allowed to:

- park within 40' from intersection;
- park in an entrance;
- park in a bus zone; and
- double park.

Therefore, do not record these violations for commercial vehicles. However, commercial vehicles are not allowed to:

- block a driveway;
- park in front of a fire hydrant; or
- park in a metered space without putting money in the meter.

These violations are to be recorded on the survey form.

Building Construction Zones

During the construction of a building, emergency no parking signs are generally posted. These signs allow construction related vehicles to have access to the construction site. Violations are not to be recorded for vehicles found parking in these types of zones. The surveyor is to make a note of the existence and extent of any construction along the survey route.

Ending the Survey Day

After 2:30 p.m., no more data is to be collected, the surveyor is to return to PMM&Co.'s office to return the completed survey forms and discuss any problems.

OTHER CONCERNS

What Are You Doing?

If someone asks you what you are doing, tell them that:

"I am counting the number of parking violations as part of a study to determine how well the new parking enforcement program is doing."

If they have further questions, have them call -

Bart Cima or
Lannetta K. Hildebrand

at 223-9525.

If a police officer or a parking control aide asks you what you are doing, tell them the same thing. But also tell them that John Brophy of the Bureau of Parking and Enforcement knows that you are out there.

Administrative Matters

Generally the surveyor will be needed from 10:00 a.m. to 3:00 p.m. on Tuesday, Wednesday and Thursday. However, other hours and days may be arranged. Data is to be collected form 10:30 a.m. to 2:30 a.m. The half hour before and after the data collection period is for travel and instructions. Two 15 minute breaks are allowed while collecting data.

If you work from 10 to 3, you will be paid for 5 hours at $7.00 per hour for a total of $35 per day. You will be paid for your training time. You will receive your money at the end of the survey.

Page____ of ____

Observer: _____

Date____/____/80____

TABLE B-1. SAMPLE COMMERCIAL AREA SURVEY FORM

BLOCK	PARKING METERS						CURBSIDE VIOLATIONS											Comments
	Vacant	Occupied Legal	Violation No Ticket	Violation w/Ticket	Standing	Total Meter Violation	40' From Intersection	Driveway	Loading Zone	Entrance	Bus Zone	Hydrant	Double Park	No Parking	Tickets Issued	Standing	Total Non-meter Violation	
Time:																		
Time:																		
Time:																		
Time:																		
Time:																		
Sheet Total																		

INSTRUCTIONS FOR CONDUCTING RESIDENTIAL AREA PARKING VIOLATION SURVEY

PURPOSE OF SURVEY

Peat, Marwick, Mitchell & Co. (PMM&Co.) has been engaged by the U.S. Department of Transportation to evaluate the District of Columbia new parking enforcement program. The enforcement program includes the use of approximately 50 civilian ticket writers, the immobilization of vehicles with four or more parking tickets through the use of "Denver" boots, and towing specific parking violators, particularly vehicles parked on rush hour restricted streets. As part of this evaluation, this survey of commercial area parking violations is being conducted to be compared with the results of a previous similar survey.

SURVEY PROCEDURE

The survey basically consists of walking along assigned streets and counting the number of parking violations. The number and type of parking violation will be recorded on survey forms which will be provided.

Starting the Survey Day

Survey data is to be collected between 10:30 a.m. and 2:30 p.m. on Tuesdays, Wednesdays, and Thursdays. In order to have enough time to pick up your survey materials and travel to the survey starting point, surveyors must arrive at PMM&Co's. offices by 10:00 a.m. Here, each survey on will be given a survey route and sufficient survey forms for that day.

Survey Route

Each day the surveyor will be given a map with the route the surveyor is to follow. The map will also indicate which side of the street will be surveyed. Each route will consist of 30 to 50 blocks.

Survey Form

A sample of a completed survey form is attached. A description of the information to be written in each section is discussed below.

Upper Right Hand Corner

In the upper right hand corner of the survey form, the surveyor is to consecutively number each page he/she uses during the day. There is also space for the surveyor's initials and the date.

Block

At the start of each block along the survey route, the surveyor looks in the column under the work, 'BLOCK' for:

- the street name and boundaries;
- the side of the street being surveyed; and should write
- the time that the survey of the block begins.

For example, if the side of the street where Peat, Marwick, Mitchell & Co. is located was being surveyed at 11:00 a.m., the surveyor would have on the form: K St., 19th St. to 20th St., south side, 11:00 a.m. Each side of each block or block face being surveyed is to be recorded as a separate row on the survey form.

Curbside Violations

The section on curbside violations will be used to record selected parking violations and also the number of parking tickets issued for these violations. The surveyor will be required to look for any of these violations as he/she surveys each block face. A definition of these selected violations is given below:

- 40' From Intersection: It is illegal for any vehicle to park less than 40 feet from a street corner. Usually there will be a sign that reads, "No Parking, Here to Corner," or white lines on the street. Any vehicle parked between the sign or the lines and the corner is in violation of the 40 feet from intersection rule. If no such sign exists, then the distance can be estimated by counting the number of sidewalk squares from the corner to the first vehicle. A sidewalk square is usually 3 feet long. Therefore, 13 squares is about 40 feet. Any vehicle parked next to the first 13 squares would be in violation of the rule. However, the posted signs on white lines always take preference over the distance from the corner.
- Driveway and Alley: No vehicle may be parked in front of or within 5 feet of a driveway or an alley.
- Loading Zone: A loading zone is a parking space reserved for the use of commercial vehicles during loading and unloading of materials. All loading zones are marked with signs that read "No Parking, Loading Zone" and then list the time and days for which the restriciton applies. A commercial vehicle is any motor vehicle designed, used or maintained primarily for the transportation of goods and materials. Any non-commercial vehicle parked in a loading zone is in violation of this rule.
- Entrance: Parking can be prohibited at the entrance of a building. If parking is prohibited, it is marked with signs which read "No Parking, Entrance." Some signs will also list the times and days for which the restriction applies. It is illegal for any vehicle to park in an area marked with these signs.

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- Hydrant: Parking is not permitted within 10 feet of either side of a fire hydrant.

- Double Park: It is illegal to park a vehicle in the traveled roadway next to a parked car.

- No Parking/Standing: The last type of violation to be counted involves the prohibiting of parking or standing a vehicle between signs which read "No Parking Anytime," No Parking" or "No Standing," at specified times. This type of violation does not include any violation described above, specifically:

  . 40' from Intersection;

  . Loading Zone;

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  . Bus Zone.

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- street repairs;
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- traffic accidents which block the street; and
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- park in a bus zone; and
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"I am counting the number of parking violations as part of a study to determine how well the new parking enforcement program is doing."

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Bart Cima or
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If you work from 10 to 3, you will be paid for 5 hours at $7.00 per hour for a total of $35 per day. You will be paid for your training time. You will receive your money at the end of the survey.

Page _____ of _____

Observer: _____

Date ___/___/00___

TABLE C-1. SAMPLE RESIDENTIAL SURVEY FORM

BLOCK	CURBSIDE VIOLATIONS												Comments
	Meters	40' From Intersection	Driveway and Alley	Loading Zone	Entrance	Bus Zone	Hydrant	Double Parking	No Parking/ Standing	Tickets Issued	Standing	Total Violations	
Time:													
Time:													
Time:													
Time:													
Time:													
Sheet Total													

APPENDIX D

REPORT OF NEW TECHNOLOGY

A thorough review of the work performed under this contract has revealed no significant innovations, discoveries, or inventions at this time. In addition, all methodologies employed are available in the open literature. However, the findings in this document do represent new information and should prove useful throughout the United States in designing and evaluating future transportation demonstrations.

300 copies