

**UMTA/TSC Project Evaluation Series**

**The Restraint of the Automobile in  
American Residential Neighborhoods**

**Final Report  
May 1978**

**Service and Methods Demonstration Program**



**U.S. DEPARTMENT OF TRANSPORTATION  
Urban Mass Transportation Administration  
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6. Abstract  This paper reviews two techniques for restraining the use of the automobile: residential parking permit programs and traffic restraint devices. The following topics related to residential parking permit programs are discussed: cause of the residential neighborhood parking problem, the effects it has on the neighborhood and its residents, and the potential solutions; the residential parking permit concept as a solution to this problem including implementation, boundary problems, visitor permits, the relationship to rapid rail stations, and legal decisions; summary of parking policies in forty communities; and parking permit program case studies for Cambridge MA, San Francisco CA, and Washington DC. Despite the problems related to the definition and treatment of boundaries, the issuance of visitor permits, and the adverse impacts on rapid transit and shopping accessibility, resident parking permit programs have become a popular means of restraining the use of the automobile in residential areas. The existing programs have been successful in accomplishing their stated goals: parking has been made available to local residents, non-resident traffic has been reduced, and the neighborhood environment has been improved.  The following topics related to traffic restraint devices are discussed: the problem of through traffic and its negative effects on a residential neighborhood; traffic restraint devices as a short-term solution and issues related to their implementation and effectiveness; the use of traffic restraint devices in 37 communities; and case studies for Berkeley CA and Seattle WA. Most of the neighborhood traffic restraint schemes have occurred in relatively less dense cities with a grid street pattern and sufficient reserve street capacity to accommodate the diverted traffic without causing serious congestion. These projects relied on local initiative by the affected neighborhoods.					
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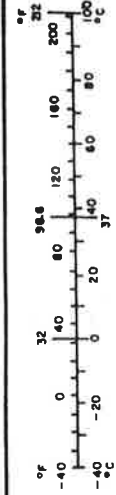
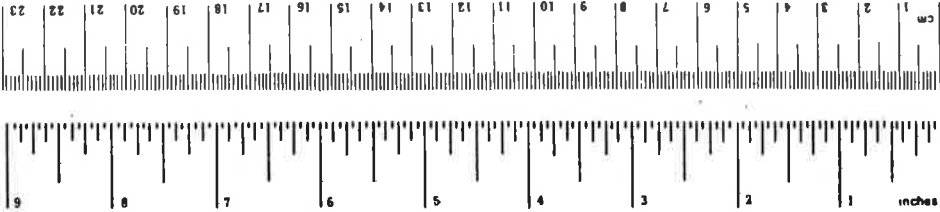
# METRIC CONVERSION FACTORS

## Approximate Conversions to Metric Measures

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

## Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
<b>LENGTH</b>				
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
km	kilometers	1.1	yards	yd
		0.6	miles	mi
<b>AREA</b>				
cm <sup>2</sup>	square centimeters	0.16	square inches	in <sup>2</sup>
m <sup>2</sup>	square meters	1.2	square yards	yd <sup>2</sup>
km <sup>2</sup>	square kilometers	0.4	square miles	mi <sup>2</sup>
ha	hectares (10,000 m <sup>2</sup> )	2.5	acres	
<b>MASS (weight)</b>				
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
<b>VOLUME</b>				
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 <sup>3</sup>	cubic meters	35	cubic feet	ft <sup>3</sup>
m <sup>3</sup>	cubic meters	1.3	cubic yards	yd <sup>3</sup>
<b>TEMPERATURE (exact)</b>				
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



## PREFACE

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## 1. INTRODUCTION

Two techniques for restraining the use of the automobile have recently become popular in the United States: residential parking permit programs and traffic restraint devices. Residential parking permit programs have been initiated in situations where parking by non-residents interfered with the parking needs of residents or with other neighborhood needs related to the environment, safety, and aesthetics. In 1977 the United States Supreme Court upheld the constitutionality of preferential parking programs for residents, removing the final obstacle to the rapid expansion of this concept throughout the country.

The second technique, traffic restraint devices, consists of physical measures placed on residential streets to inhibit the flow of through-traffic and to divert this traffic to designated arterials on the periphery of the protected area. Some of the more common and effective restraints are: "stop" signs to slow or discourage traffic, diagonal diverters and semi-diverters at intersections, and barriers to create cul-de-sacs.

While both of these approaches are aimed at restraining the use of the automobile in residential areas, they have little in common as far as appearance or specific purpose. The residential parking permit programs employ a licensing technique to prevent non-residents from coming into an area and parking their cars, while the traffic restraint programs use physical devices to prevent or minimize traffic, be it resident or non-resident, from passing through an area. For this reason, the two techniques are treated separately.

The first half of this paper discusses parking policies in residential neighborhoods. Section 2.1 describes the causes of the parking problem, the effects it has on the neighborhood and its residents, and the potential solutions. Section 2.2 focuses on the residential parking permit concept as a solution to this problem. Implementation, boundary problems, visitor permits, the relationship to rapid rail stations, and legal decisions are discussed in this section.

Section 2.3 provides a summary of parking policies in forty communities. Curbside bans, limits on consecutive parking hours, and alternate side requirements during daytime hours are included in addition to residential parking permit programs when these techniques have been used to prevent long-term parking or to improve the neighborhood's environment, aesthetics, and safety. Section 2.4 contains case studies for Cambridge, Massachusetts, San Francisco, California, and Washington, D.C. Section 2.5 summarizes the parking portion of the paper.

The second half of the paper is devoted to the use of traffic restraint devices in residential neighborhoods. Section 3.1 discusses the problem of through traffic and its negative effects on a residential neighborhood. Traffic restraint devices are singled out as the most readily available short-term solution to the problem, and issues related to their implementation and effectiveness are discussed.

Section 3.2 describes the traffic restraint devices that are being used in the United States. Section 3.3 summarizes the use of traffic restraint devices in 37 communities. Section 3.4 contains case studies for Berkeley, California and Seattle, Washington. Finally, Section 3.5 summarizes the traffic restraint portion of the paper.

## 2. PARKING POLICIES IN RESIDENTIAL NEIGHBORHOODS

### 2.1 The Parking Problem and Some Solutions

Non-resident parking restrictions consist of regulatory actions designed to reduce or eliminate the use of on street parking spaces by automobiles from outside a residential neighborhood. These measures have been initiated by the residents and implemented by the municipalities when parking by non-residents had increased to the point of interfering with the parking needs of the residents or with other neighborhood activities. The techniques employed for restriction are bans on curbside parking in residential areas, limits on the number of consecutive parking hours, alternate side parking requirements during mid-morning or mid-afternoon, and residential parking permit programs.

#### The Problem

The prime concern that has motivated most parking restriction programs has been the loss of parking spaces needed by the residents. Parking problems in residential areas typically occur when a major nearby attractor of trips does not provide sufficient parking of its own. Among the 23 communities that had either implemented or were considering non-resident prohibitions (see Table 2.1 and Appendix C), the following primary generators of undesired parking were cited (some localities cited more than one cause, and a few did not name any):

Downtown employment	10
University	6
Medical center	2
Retail, entertainment	3

Most of the parking problems were generated by commuters who would park on the residential streets all day. Weekend shopping and evening entertainment trips created problems in a few areas. Even relatively modest amounts of parking by non-residents during the evening hours can create severe problems since the evening is when most of the residents are at home and require a space for their automobiles.

The impact on residents whose parking spaces have been used by vehicles from outside their neighborhood tends to be most serious in older inner-city districts where the physical fabric allows for little or no off-street parking. In lower density single family areas and newer multi-family developments, off-street parking is generally available and residents are less reliant on curbside spaces. However, indoor parking for apartment dwellers is generally very costly.

The environmental impacts of non-resident parkers are perceived as being most adverse by residents of neighborhoods with a strong identity or specially valued residential character. Often these are lower density neighborhoods where the safety of children playing in the streets, the unencumbered flow of social interactions among friendly neighbors, and the quiet, relaxed quality of the neighborhood environment can be easily degraded by the presence of too many automobiles.

### The Solutions

Three types of solutions can be applied to the neighborhood parking problem:

1. Restriction or prohibition of non-resident parking by one or more of the schemes mentioned above
2. Provision of sufficient and competitively priced off-street parking
3. Reduction or elimination of the need for auto travel by providing a competitive transit alternative.

Ideally these components should be combined into a coordinated program: the transit improvement acting as the "carrot," the parking restriction as the "stick," and the off-street parking as the cushion for those who, for one reason or another, find it necessary to drive. In practice, however, each relies on a different initiative and a different pattern of funding, decision making, and coordination. Typically a residential community becomes impatient with the invasion of outside autos and applies

TABLE 2.1

## SUMMARY OF PARKING POLICIES IN RESIDENTIAL NEIGHBORHOODS

	(1) Curbside Ban	(2) Hourly Limits	(3) Alternate Side	(4) Non-Resident Prohibition
Arlington County, VA		X	X	X
Atlanta, GA		X		
Baltimore, MD			X	U/C
Berkeley, CA				
Boston, MA		X		X
Bronx-NYC, NY		X	X	
Buffalo, NY		X	X	
Cambridge, MA		X		X
Charlottesville, VA				X
Chicago, IL		X		X
Cincinnati, OH		X		U/C
Cleveland, OH		X		
Denver, CO		X		
Harrisburg, PA				U/C
Los Angeles, CA		X		
Madison, WI		X		X
Miami, FL		X		
Midtown Manhattan-NYC, NY	X	X	X	
Milwaukee, WI		X		X
Minneapolis, MN	X	X		X
Montgomery County, MD		X		X
New Brunswick, NJ		X		U/C
New Orleans, LA		X		X
Oakland, CA		X		
Philadelphia, PA		X		
Pittsburg, PA		X		U/C
Portland, OR	X	X		U/C
Prince George's Cyt, MD	X	X		X
Providence, RI	X	X		
Queens-NYC, NY		X		
Richmond, VA		X		X
Rochester, NY		X		
St. Louis, MO				
Salem, OR		X		X
San Antonio, TX				
San Francisco, CA		X		X
Seattle, WA	X			U/C
Tucson, AR	X	X		
Washington, DC		X		X
Wilmington, DE	X	X		X

pressure to enact parking restrictions independently of the provision of alternatives. This problem is elaborated upon in the next section.

The restriction or prohibition of non-resident parking is the least expensive and easiest of the three types of solutions to implement. Curbside bans, limits on consecutive parking hours, and alternate side requirements during daytime hours have been used in many localities to discourage long-term parking by commuters and to improve the neighborhood environment. However, these practices are fairly common in many countries and are used for other purposes as well, such as to provide sufficient space for through traffic (a goal somewhat counter to that of improving the environment) and to facilitate street cleaning. Therefore, they will be dealt with only briefly in Section 2.3. The next section is devoted to the much more interesting and effective restriction technique, the residential parking permit program.

## 2.2 Residential Parking Permit Program

The most widespread technique in the United States to prevent non-resident long-term parking is the residential parking permit program. There are several possible variations: non-residents are allowed to park for limited amounts of time in regulated areas; non-residents are excluded both during the day and at night; and non-residents are prohibited from parking during certain hours (typically 8:00 a.m. to 6:00 p.m., Monday through Friday) but are permitted to park in the evening and on weekends. Parking permits are generally sold for a nominal price sufficient to offset administrative costs and are displayed in a window or pasted to a bumper. The cost for enforcement is more than offset by the revenues obtained from violators.

### Initiation and Implementation

Most of the residential parking permit programs now in effect were initiated by individual residents or local organizations who were disturbed by the problems described above. The initial advocates obtained wide neighborhood support through petitions or referenda and then brought sufficient pressure on the city government to enact the program. Implementation consisted of setting the regulations, selling the residential permits, and enforcing the restrictions through ticketing.

Once one neighborhood in a city has implemented a permit program, additional parking permit programs have frequently spread to adjacent neighborhoods. This often happens if the "problem" vehicles shift to an adjoining area or when residents living just outside the boundary of a parking district suddenly discover that they have lost their favorite parking area. Thus, the pressure from every

neighborhood to obtain its own permit program is quite predictable.

### Boundary Issues

Residential parking permit programs presume a distinction between "members" of the neighborhood who are permitted to park and "outsiders" who are either excluded or are subject to stringent regulations. The permits apply within set geographical boundaries, and they are available only to persons residing within these boundaries. In some cases the boundaries are drawn around individual neighborhoods while in others the boundaries are city-wide. City-wide zones are most appropriate in smaller communities where the number of commute trips excluded is significantly larger than the commute trips internal to the community. City-wide zones also encourage local residents to patronize their city's commercial establishments.

Problems may develop under the neighborhood option when residents just across a boundary line find they can no longer park in their accustomed spot. The original zone could be enlarged or a buffer zone created encompassing parts of two adjoining zones. Residents living in this buffer-zone would then be able to park anywhere within its boundaries as well as in their primary zone.

### Visitor Permits

A major problem occurs with the treatment of non-residents whose presence in the neighborhood is desired (guests), essential (teachers, patients for medical services), or dependent on a vehicle (contractors). The problem arises not so much in agreeing that these persons should have access to the neighborhood by automobile, but in deciding how to accomplish this in an enforceable manner.

The customary way of providing parking privileges for these individuals is by issuing visitor permits. However, in large, congested zones residents could easily abuse their guest privileges by selling or giving these permits to friends commuting from outside the area. Such a practice would most likely go unnoticed by the police. On the other hand, in smaller, less crowded areas, a car displaying the same guest sticker day after day would be more obvious.

Localities issuing guest permits also issue permits to doctors and other professionals who receive clients. In general, the police are lenient with contractors whose vehicles display proper identification and oftentimes will make special dispensation for social and civic functions.

## Rapid Transit Stations

Rapid transit commuter parking was cited by six of the localities having a non-resident parking ban as one of the prime reasons for implementing the program and by two other areas considering such bans (see Table 2.1). This situation occurs in major metropolitan areas that have large volumes of central business district (CBD) bound commuters with origins in the outer suburbs; it holds for both the older rapid transit systems which typically end at the center of one of the inner residential areas, as well as the two new rapid rail systems, BART in San Francisco and the Washington Metro. Center city congestion and parking shortages act as strong deterrents to driving to the CBD, and commuters choose to drive only as far as the first convenient rapid rail station. Unfortunately, the use of feeder bus lines to rapid transit stations or express bus terminals is not often seen as being a satisfactory substitute to the automobile. In the low density residential patterns of suburban development, sufficient coverage and frequency of bus operation is almost impossible to achieve.

Even in the case of BART and the Washington Metro, sufficient park-and-ride accommodations have not been provided. Surface lots consume enormous amounts of increasingly expensive land, and garages are costly to build. But when financing is available for these parking garages, they often come up against opposition from local residents. Objections are raised to both the traffic generation and the environmental impact of such facilities.

A good example of this is in Cambridge where, at the new Alewife Brook rapid rail station, residents forced a compromise by reducing the garage size from the original projected need of 5000 spaces to 2000. Fear of traffic and the physical impact of such a large structure were cited as reasons. (In addition, the residents feared that with such large parking provisions a station that was planned to be the temporary terminus of the extension was more likely to become the permanent end of the line.) The result of this reduction, in combination with a non-resident parking ban now in effect, is that park-and-ride capacity at that station is effectively limited to 2,000 cars.

Thus, there is often a clear conflict between transit plans and non-resident parking bans. The implications and potential resolutions of these conflicts are further illustrated in the case studies and are discussed in the conclusions.

## Legal Decisions

A recent United States Supreme Court decision removed the final legal obstacle to this concept. The Supreme Court upheld an Arlington County, Virginia ordinance which bans non-resident parking on designated streets (County Board of Arlington County, VA, et.al. v. Rudolph A. Richards, et.al.; October 11, 1977). The ordinance is found in Appendix A, and the Supreme Court decision is found in Appendix B. The Court stated that the Arlington ordinance is intended "to reduce hazardous traffic conditions resulting from the use of streets within residential (areas) . . . for the parking of vehicles by persons using districts zoned for commercial or industrial uses . . . ; to protect those districts from polluted air, excessive noise, and trash and refuse caused by the entry of such vehicles . . . (and) to preserve the character of those districts as residential districts . . ." The Court concluded that reducing air pollution and other adverse environmental effects are legitimate goals and that "a community reasonably may restrict on-street parking available to commuters, thus encouraging reliance on carpools and mass transit." The Court also noted that the same goal is served by encouraging residents to leave their cars at home during the day.

Litigation over non-resident parking regulations has produced two other major court decisions. The Massachusetts Supreme Court had previously accepted the validity of non-resident prohibition in Cambridge (Commonwealth v. Guy A. Petralia; April 29, 1977); this decision is described in the Cambridge case study in Section 2.4. An Ohio County Court struck down a parking restriction on non-residents in 1970; however, in light of the recent U.S. Supreme Court decision, it is doubtful that the Ohio decision would stand if challenged today.

### 2.3 Summary of American Experience

Information about parking policies of forty communities throughout the country was obtained. The research addressed the reasons for different policies, implementation issues and processes, and the effectiveness of different regulations. The reader should note that these communities do not comprise a random sample of communities throughout the United States. The selection process was arbitrary and strove to find communities with the parking policies described above.

The four policies affecting the supply and distribution of neighborhood parking identified above were examined:

1. bans on curbside parking in residential areas
2. limits on the number of consecutive parking hours



3. alternate side parking requirements during mid-morning or mid-afternoon
4. non-resident prohibition (residential parking permits).

Table 2.1 summarizes the findings; more detailed information for each site is found in Appendix C. An "X" indicates that a city is pursuing one of the four parking policies to either prevent long-term parking or improve the neighborhood environment, aesthetics, or safety. If a community has instituted one of these policies for some other purpose, such as a curbside ban to improve traffic flow on a narrow street, this has not been so noted. However, these practices are described in Appendix C. Communities which are currently discussing, or plan to implement, residential parking permit programs have been identified with a U/C (under consideration).

Non-resident prohibition has already been treated in depth and is the subject of the two case studies in Section 2.4. In addition to the sixteen existing programs, residential parking permit programs are being considered by several other communities.

#### Curbside Bans

Curbside bans may prohibit on-street parking at certain times, on certain days, at all times, on one side, on both sides, or combinations of the above. Eight of the cities contacted employed some type of ban to prevent long-term parking. Although many communities employ parking bans for a variety of reasons (the most commonly cited reason was inadequate street width), Table 2.1 identifies only those areas which were consciously prohibiting parking to alleviate commuter-induced congestion or improve the neighborhood environment.

Additional reasons for curbside bans are included in Appendix C. Emergency vehicle access was of particular concern with both fire and police departments requesting parking bans. Commuter thoroughfares traversing residential areas are frequently the subject of parking bans during peak traffic hours as are bus routes in residential neighborhoods.

#### Limits on Consecutive Parking Hours

Restrictions on the number of consecutive parking hours were found to be the most popular regulation used to prevent long-term parking (33 of the 40 communities use them). In large part, this popularity stems from the legal and political acceptance these regulations enjoy in all parts of

the country. The most common restrictions are for one or two hours.

Daytime hourly parking limits have been initiated in most residential areas to prevent the long-term parking attracted by commercial districts, employment centers, transit stations, schools, recreation areas, etc. Traffic departments typically respond to resident requests for parking relief and will regulate on-street parking if parking studies indicate a need.

Some communities employ hourly restrictions in conjunction with their preferential parking programs. The parking permits exempt residents from the hourly restrictions. In several instances, the residential permit program grew out of resident complaints about hourly restrictions (which applied equally to residents and non-residents). Another policy to minimize the burden on residents is selective enforcement. Some communities indicated they only enforce the regulations when residents complain and, then, in a manner which avoids ticketing residents.

#### Alternate Side Requirements During Daytime Hours

Five of the communities contacted employ alternate side parking requirements which change during the morning or afternoon. The purposes of this regulation are twofold: (1) to permit street cleaning, and (2) to discourage long-term parking. The effect of this policy is to prevent commuters from parking on those streets all day. Enforcement is straightforward and the police department cooperates with the sanitation department to remove illegally parked cars.

#### 2.4 Case Studies

Case studies are presented for Cambridge, Massachusetts, San Francisco, California, and Washington, D.C. The three cities are densely populated, but Cambridge is much smaller and less complex than the other two. Cambridge now has a city-wide preferential parking permit program while the ones in San Francisco and Washington are on a neighborhood by neighborhood basis. The Cambridge plan is well established, having been started in 1972. The San Francisco plan is young and ambitious and is currently experiencing growing pains. The Washington plan, which began in 1976, will include 24 neighborhoods by August 1978.

#### Cambridge, Massachusetts

Cambridge, Massachusetts is an older-style city across the Charles River from Boston. It is the home of Harvard University and the Massachusetts Institute of Technology,

has a major shopping and entertainment district in the area surrounding Harvard Square, and contains the terminus of a major rapid rail line into Boston. Before the residential parking program went into effect, many of Cambridge's residential areas were being used as parking lots by commuters travelling into Boston.

Cambridge is densely populated; there are approximately 25,000 persons per square mile in its 4 1/2 square mile land area (excluding the two universities). Forty-thousand automobiles are registered in the City, and there is very little off-street parking available. The street pattern is characterized by major arterials radiating from several squares throughout the City. These arterials are connected by narrow, residential streets (see Figure 2.1).

In 1972 the Massachusetts State Government passed legislation (Chapter 340 of the Acts of 1972) enabling the director of traffic and parking in each city to prohibit parking of motor vehicles on the whole or any part of one or more residential streets under the control of the city. The first resident sticker parking program was instituted in the Cambridgeport neighborhood of Cambridge in 1972 to prevent students commuting to Boston University from parking in the area and walking over the bridge to classes in Boston (see Reference 1). In order to meet the legal requirements established by the State, the regulations were advertised in the local newspaper and a notice was mailed to all families in the area informing them of the program.

The price of the sticker was set at \$1, and no guest stickers were sold under the original plan. The fine for parking without a sticker was set at \$15. Enforcement began in January 1973, and the number of daily violations declined from 132 to 29 in just two and one-half weeks.

However, several complaints were soon received from non-residents and residents alike. The most common complaints were lack of parking for guests of residents, customers of stores, and patients of doctors; for contractors on a job, for church and school functions; for rented or borrowed vehicles; and for students with out-of-state plates. However, the overall consensus was that the program was a good idea and should be continued on a modified basis.

The program was suspended for two months until solutions could be found to these problems. At the end of this period it was re-instituted with the following modifications: two visitor permits (at \$.50 each) were issued to each resident of the neighborhood; the proprietor of a business located on a street in a residentially zoned area was given the option of having the parking spaces in front of his building omitted from the residential sticker restrictions; doctors and similar professionals were issued

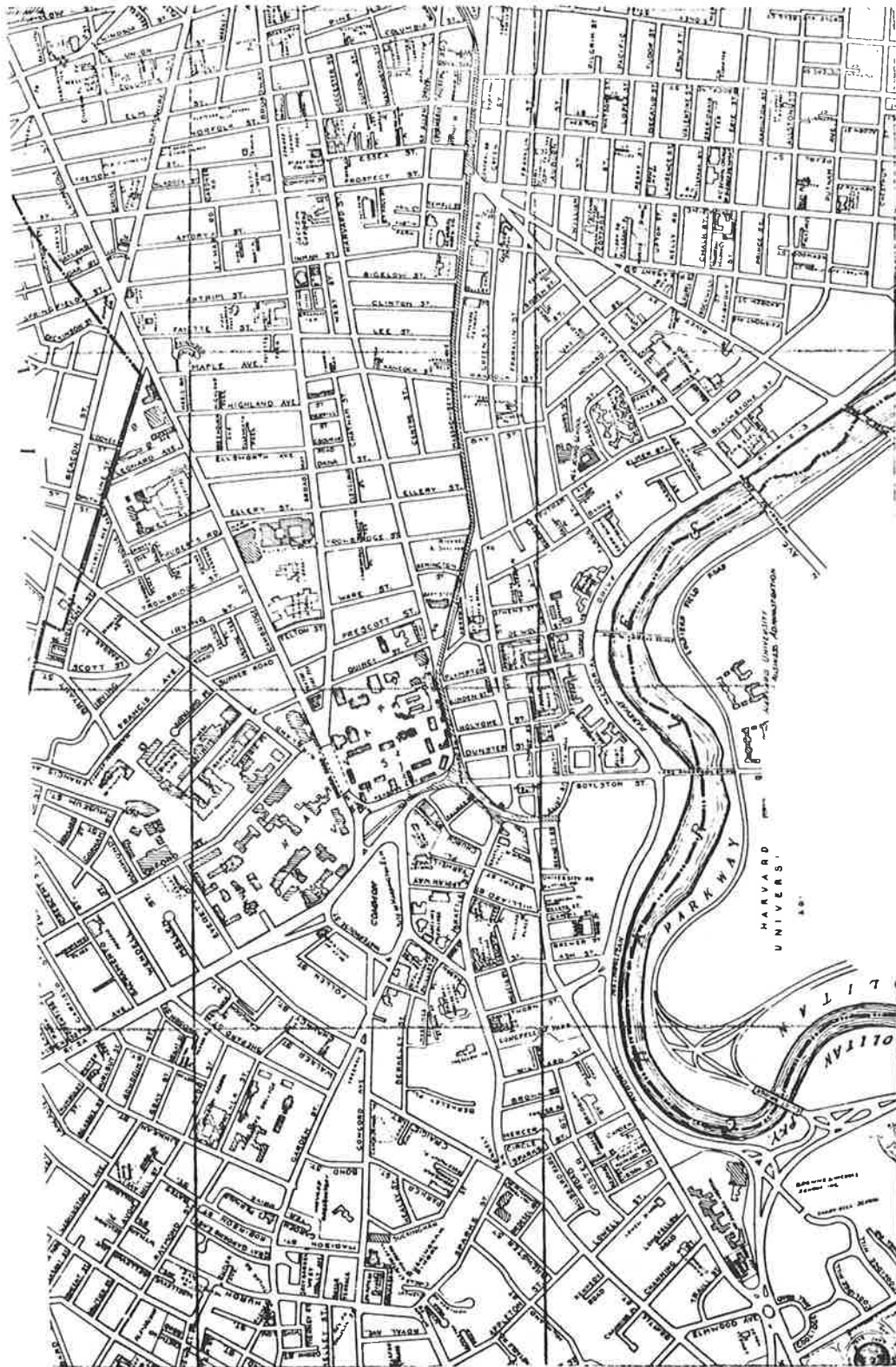


FIGURE 2.1 MAP OF CAMBRIDGE, MASSACHUSETTS - HARVARD SQUARE AND ENVIRONS

visitor permits for their clients; the police were requested not to ticket commercial vehicles belonging to contractors working in the area (such as carpenters or plumbers) if these vehicles were identified by a company name, address and phone number; parking for church or school functions was allowed if a telephone request was made to the police department; Sunday was omitted from the restricted period; stickers were issued to residents of rented vehicles who met the resident requirements; and students were required to register their cars in Massachusetts to qualify for a sticker.

In order to prevent the guest permits from being abused, parking officers would note when a guest sticker appeared on the same vehicle day after day. The resident owner of the sticker would be sent a letter of warning, and if the practice continued, the sticker would be revoked.

The modified program was judged a success and was expanded to include the Mount Auburn/Brattle Street area adjoining the Mount Auburn Hospital. Persons associated with the hospital had been filling all available on-street spaces rather than pay for parking in the hospital's lot. The program remedied this situation.

One of the most critical parking problems had developed in Harvard Square, which is the terminus of a rapid rail line, the location of Harvard University, and a major center for shopping and entertainment. Residents in neighboring residential areas found the streets in front of their homes filled with vehicles belonging to commuters, students, shoppers, and tourists at all hours of the day and night.

It is interesting to note that implementing the residential permit program in the Harvard Square area did not result in complaints from this group of non-resident parkers. One of the reasons for this was that good feeder bus service was available from the neighboring communities into Harvard Square, and people were able to find reasonable alternatives to parking on the street. In general, after modifications were made in 1973, there have been very few complaints about the program.

There were, however, several court cases affecting the program. Initially stickers were issued only to residents living in the areas where the restrictions were in force. In 1974 a County District Court judge ruled that a parking permit program available to all Cambridge residents would be valid but that one that did not permit all city residents to obtain a sticker discriminated among Cambridge residents in violation of the equal protection clause of the Fourteenth Amendment to the United States Constitution (Commonwealth v. Henry P. Sorett). As a result, the traffic director altered the parking sticker program to make the stickers available to all residents of Cambridge who owned vehicles principally

garaged in the City; these stickers were valid throughout the City. On the other hand, guest stickers, which are color coded, remained valid only in the area of residence.

Once the stickers were valid city-wide, a resident in any part of Cambridge could drive to one of the three rapid rail stations and park all day. Yet, since Cambridge is small vis-a-vis the surrounding area, the demand on these spaces was not sufficient to render the program ineffective.

In 1975 a suit was filed against the City by a non-resident arguing that the parking regulation discriminated against him as a non-resident in violation of his right to equal protection of the laws. The legality of the suit was tried in a state court (Commonwealth v. Guy A. Petralia), and the legality of the parking program was upheld.

The court stated that:

the basic question is whether the classification made by the regulation rationally furthers a legitimate state purpose....We think that a regulation which discourages persons from driving their automobiles to the congested neighborhoods... deals rationally with the public interest in reducing highway congestion, in reducing air pollution, and in encouraging the use of public transportation in place of private transportation.

We turn then to the question whether the Cambridge parking regulation's distinction between Cambridge residents who have obtained parking permits and all others rationally furthers one or more of these legitimate state interests....We conclude that the placing of motor vehicles of residents of Cambridge in a category apart from all other motor vehicles is not irrational.

Those Cambridge residents most interested in parking in the restricted area are those who live in it. If they leave their cars parked near their homes, they contribute nothing to air pollution or to the congestion of moving traffic on the highways. In general, those Cambridge residents who do not live in the restricted area but are permitted to park in it have a shorter distance to travel and will contribute less to air pollution than will persons driving to the restricted area from other municipalities. Legislative classifications need not be perfect in order to survive a challenge on equal protection grounds.

The discrimination made by the Cambridge regulation is based rationally on the use or non-

use of a motor vehicle. A resident who parks near his home is not using his automobile, whereas a person who parks in an area away from his home has used his vehicle and thus has contributed to the problems which the Cambridge regulation seeks to address. The rational distinction made by the Cambridge regulation is founded on vehicle use. Place of residence is merely a reasonable means of measuring that use.

The sticker program has been expanded each year until by the end of 1978 ninety percent of eligible streets will have been posted with 5000 signs. The number of parking control officers has been increased from two in 1972 to 25 in 1978 to enforce the program. Revenue from the citations they issue more than offsets their cost to the City.

Due to the effectiveness of the program, available parking spaces are more than sufficient for resident requirements. The City is contemplating instituting alternate side parking to facilitate street cleaning, snow plowing, the identification of stolen or abandoned cars, and to return more of the street area to the people.

#### San Francisco, California

San Francisco is in the process of implementing a major residential permit parking program throughout the city. The City government passed the enabling ordinance in August 1976 to set up residential parking zones. The following steps are required to implement a parking zone:

1. petitions signed by 250 citizens
2. a study by the Department of Public Works to recommend the type of scheme most appropriate to the area
3. a public meeting where boundaries, time limits, and days of enforcement are finalized
4. a written report presented to the City Council
5. a positive vote by the City Council to implement the plan.

In August 1977, a small area (7 blocks) around the Daly City BART station became the first restricted district. Parking was limited to two consecutive hours except for those cars with a resident sticker. The yearly cost for the sticker is \$10, and it must be affixed to the rear bumper of the resident's automobile. The initiative was taken by a single resident who obtained the necessary signatures on petitions. The Daly City station is at the end of a BART rapid rail line and is the station closest to San Mateo

County, a major residential area for commuters working in San Francisco. Freeway I-280 provides easy access from the San Mateo Peninsula to Daly City, and commuters had been filling all available parking spaces on the local streets around the station. Several months after the parking prohibition went into effect, a multi-story parking garage providing free parking was opened adjacent to the BART station. However, the number of spaces in the garage was inadequate to serve the commuters, and the parking ban remains in effect.

A major residential parking district was implemented in March 1978 in the Telegraph Hill - North Beach - Russian Hill neighborhood of San Francisco (see Figure 2.2). This area is within a mile of the CBD, is densely populated, has little off-street parking, and has excellent transit access to the CBD by bus, trackless trolley, and cable car. Commuters from Marin County (to the north of San Francisco) coming over the Golden Gate Bridge had found it convenient to park here and ride transit to work. In fact, a study conducted by the San Francisco Department of Public Works (Reference 2) found that 68 percent of the vehicles parked in this neighborhood during the day came from outside the area.

The parking restrictions are in effect from 8:00 a.m. until 9:00 p.m., Monday through Saturday. A resident must purchase a registration sticker for \$10 and affix it to the back bumper of his car. The sticker contains the car's license plate number so that it can not be transferred. Provisions have been made for residents who lease cars to obtain a sticker, but for residents who rent cars on a short term basis a solution has not been worked out. Initially, guest passes were to be sold for \$1 for a 14 day pass. However, the City was afraid that these passes would be abused (given or sold to commuters) and the police claimed that there were no available means for enforcement, so it was decided not to issue any guest passes. As a result, guests planning to stay more than two hours can not arrive before 7:00 p.m. (two hours before the restrictions end).

Besides having no provisions for guests, the program has several other shortcomings that the City is attempting to work out. There is no provision for workmen such as carpenters who must bring their tools via a truck. Under the current system workmen are legally required to move their vehicles every two hours. However, it appears that the police are being lenient with them. People who live in high-rise apartment buildings and currently rent parking space in the building (for as much as \$60 per month) may now decide it is cheaper to park on the street (where spaces have suddenly become available). If this happens, building owners may turn to commuters to fill up their garages.



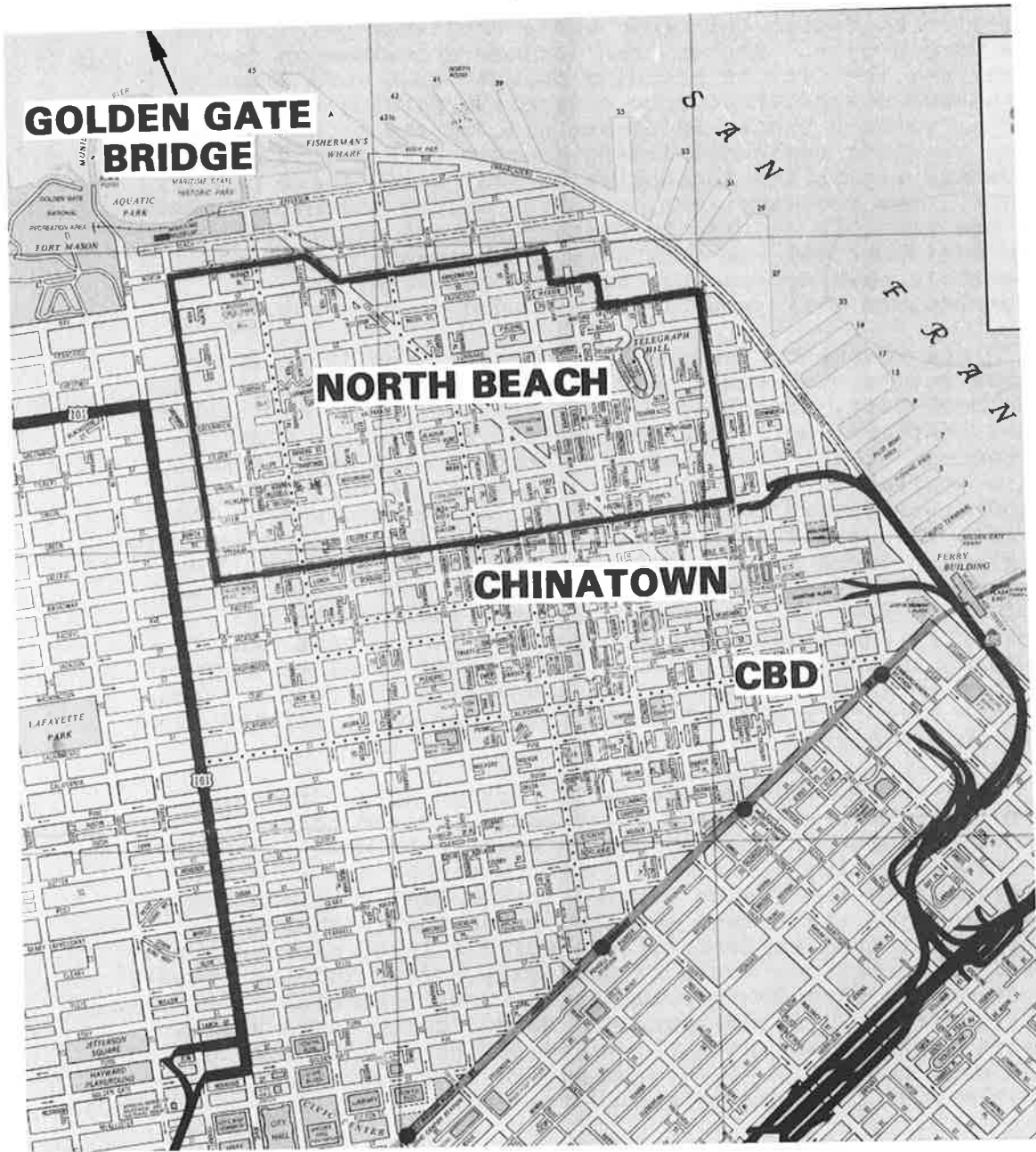


FIGURE 2.2 MAP OF SAN FRANCISCO, CALIFORNIA - CBD AND NORTH BEACH AREAS

The boundaries of the area were very hard to define, and persons living just over the border are unhappy because they can no longer park in the restricted area. This problem is particularly acute at the southern edge of the district bordering Chinatown where available parking spaces are very scarce. Rather than include Chinatown in the district, the City is planning to make this very densely populated neighborhood into a separate parking district. A buffer zone, 2 blocks on either side of the boundary, has been created; residents living in this buffer zone can park anywhere within its boundaries as well as in their primary zones. The Broadway area, which is at the southern border of the zone, is devoted to restaurants and night life, and non-residents who use this area in the evening fill all available parking spaces. For this sub-area, the restrictions will probably be extended to midnight.

San Francisco intends to implement from 15 to 20 new zones during the next 6 to 18 months. These areas are, for the most part, adjacent to major traffic generators such as BART stations, colleges, and medical facilities. The situation at the Glen Park BART station is a case in point. This station is in a valley and is adjacent to I-280. By 7:00 a.m. freeway commuters as well as residents from the neighboring hills have filled every available space near the station. There is no commuter parking lot, and San Francisco does not intend to build one. The official city policy is that all access to the BART stations be by transit. While San Francisco has one of the best transit systems in the United States, the transit level of service is far inferior to that of the automobile for feeder trips to the Glen Park and other BART stations where parking plans are contemplated.

Since there is no available parking after 7:00 a.m., the usefulness of BART to other commuters and to mid-day travelers who find the transit access to be unsatisfactory is severely limited. The solution would be the substantial upgrading of the feeder service to the BART stations and the extension of the system into San Mateo County where sufficient land is available to build a large park-and-ride lot. Both actions would be extremely costly and the transit systems are already experiencing serious financial difficulties. In addition, San Mateo County voted against being included in the BART system during its planning period and most certainly would continue to vote against it due to BART's poor performance record to date.

#### Washington, D.C.

The Washington, D.C. residential permit parking program is currently in effect in 11 areas of the District and will be expanded to 13 more by August 1978. The District is divided into eight zones and a sticker issued to a resident

living in an effected area is good in all affected areas within the same zone. However, it is not valid in any of the other seven zones. The permit parking restriction is in effect from 7:00 AM to 6:30 PM on weekdays, except holidays. Persons without a permit can park for no more than two hours on a restricted street. The sticker, which costs \$5 per year, is affixed to the car's rear window and contains the license plate number of the vehicle. Two fifteen-day visitor permits may be obtained free by each household. One-day permits are issued in unlimited numbers. Students and other temporary residents are eligible for stickers, but only if they can prove that they are actual zone residents and meet the District's requirements for vehicle registration.

Table 2.2 lists the existing and proposed neighborhoods and the reason for the parking ban. The primary reasons for the parking bans are major attractors such as universities, hospitals and transit garages, transit transfer points, and proximity to the CBD.

TABLE 2.2

WASHINGTON, D.C. PARKING PERMIT NEIGHBORHOODS

Existing

Friendship Heights (March 1976) - Transit garage attracting large number of employees

Gateway (March 1976) - Transit garage attracting large number of employees

Walter Read (June 1976) - Walter Read Army Hospital

Pleasant Park (June 1976) - Commuter transfer to bus

Georgetown (August 1977) - Georgetown University and convenient commuter parking

Burleith (August 1977) - Georgetown University and convenient commuter parking

Foxhall Village (August 1977) - Georgetown University

Foggy Bottom (September 1977) - George Washington University and convenient walk to CBD

Glover Park (September 1977) - Major bus line

Capitol Hill (September 1977) - Major bus line and convenient walk to CBD

Kalorama/Adams Morgan (October 1977) - Embassies

To be implemented by August 1978

Potomac Palisades - Bus lines

Spring Valley/Wesley Heights - American University

Dupon Circle - Rapid rail, bus, and convenient walk to CBD

Cleveland Park - Commuter transfer to bus

Van Ness Center - University of the District of Columbia and large shopping complex

Woodley Park - Commuters

Georgia Avenue - Transit garage

TABLE 2.2 (CONTINUED)

WASHINGTON, D.C. PARKING PERMIT NEIGHBORHOODS

Detroit Park - Howard University

Brookland - Two rapid rail stations and Catholic University

Anacostia - Major bus line

Minnesota Avenue - Schools and future rapid rail station.

Tacoma Park - Rapid rail station

Dhillum - Rapid rail station

A neighborhood wishing to implement a parking permit program proceeds as follows:

- A petition is signed by fifty-one percent of the residents on a block (the permit program may be implemented in as small an area as one block within a neighborhood).
- The petition is submitted to the mayor.
- The mayor sends the petition to the Washington Department of Transportation.
- The Department of Transportation conducts a parking study:
  - between 7 AM and 6:30 PM, 70 percent of the legal spaces must be filled
  - 10 percent of the cars must be from outside the ward.
- The Department of Transportation considers the following factors:
  - the clean air requirements of Federal and District air quality plans
  - the possibility of a reduction in vehicle miles travelled
  - the likelihood of alleviating traffic congestion, illegal parking, and related health and safety hazards
  - the proximity of public transportation
  - the desire and need of the area residents for residential permit parking and their willingness to bear the associated administrative costs
  - the need for parking for periods in excess of two hours for business establishments and the general public for religious, health, or educational purposes; and
  - the need for parking regulation to maintain the stability of neighborhoods.
- Following 30 days notice, a public forum is held. This is done for the entire ward in order to minimize costs.

- The records of the forum are kept open for two weeks in order to add additional blocks.
- Thirty days later the hearing officer submits the proposal to the mayor.
- The mayor has 30 days to act; the mayor submits the proposal to the City Council.
- The City Council has 45 days to act.
- The Department of Transportation has 30 days to implement the plan.

The Washington program was the subject of one court case brought by the Business and Professional Association of Georgetown. The judgement by the Superior Court of the District of Columbia was in favor of the City. The Court found that: there is no invidious discrimination in the regulation; the legislation is rational; the regulation does not violate the equal protection clause of the Constitution; and the regulation is a reasonable exercise of the police power and therefore does not violate the Constitution.

An impact analysis was carried out in the Friendship Heights area. Total vehicles parked on the streets decreased by 56 percent from 1140 to 501 after the program was implemented. It is interesting to note that while the number of non-Washington vehicles declined by 62 percent (713 to 270), vehicles with Washington plates declined by 45 percent (427 to 231) indicating the large number of commuter trips made within the city.

While there has not been a high level of enforcement in the Friendship Heights area, the residents have been satisfied that the level of enforcement is sufficient to meet their needs. Businesses have not been adversely affected. Before implementation, business owners were concerned that they and their employees would no longer be able to find a free parking space. However, since the program has made short-term parking spaces available to customers, it has probably helped business in the area. Even many members of the Georgetown Merchants Association who had been against the concept are now pleased with the program.

Another interesting result is the change in the use of the Robert F. Kennedy Memorial Stadium parking lot on the eastern edge of the Capitol Hill area. Before the permit program was instituted on Capitol Hill, this lot was empty; commuters preferred to park on the street rather than pay the \$1 parking fee. Now that the program has been implemented, the one-thousand space lot is filled each day.

At present parking regulations are enforced by the police department; the amount of enforcement of the permit program varies from district to district, depending on the priority it is given by the district police officer. Washington expects to implement a major parking enforcement program beginning October 1978. The program calls for a significant increase in the levels of ticketing, towing, and booting without adding highly trained policemen and without using valuable judicial expertise to hear complaints arising from the tickets. The increased traffic enforcement would generally be handled by the Washington Department of Transportation with a staff of six supervisors, eight administrative personnel, and 50 ticket writers. Adjudication of traffic cases would be transferred from the court system to the Traffic Adjudication Bureau of the Department of Transportation.

## 2.5 Parking Conclusions

Despite the problems related to the definition and treatment of boundaries, the issuance of visitor permits, and the adverse impacts on rapid transit and shopping accessibility, resident parking permit programs have become a popular means of restraining the use of the automobile in residential areas. The existing programs have been successful in accomplishing their stated goals: parking has been made available to local residents, non-resident traffic has been reduced, and the neighborhood environment has been improved.

The concept is sufficiently flexible so that a community can tailor its program to best meet its needs; the days and hours restrictions are in effect, the definition of those who qualify for parking permits, the boundaries of the area, the relationship among different areas, and the level of enforcement can be adjusted until the program runs smoothly. For example, during the first month of operation of San Francisco's North Beach neighborhood parking program, the area has been enlarged slightly and a buffer zone created in a problem section. In the near future the hours of restrictions will be changed in the entertainment area of the zone since it continues to attract non-resident parkers during the evening hours. In Cambridge, the restrictions were modified to eliminate Sunday from the control period after receiving numerous citizen complaints.

As in the case of traffic restraint devices, the implementation of residential parking permit programs is ideally suited to the locally based political structure of cities. A program can be initiated by a neighborhood in response to a highly visible problem. The concept is politically popular since those who benefit comprise a clearly identifiable constituency in the city while those who lose their parking rights are usually from outside the area.



However, with this ease of implementation comes a very serious cause for caution: the locality planning a non-resident parking prohibition should be required to take into account the consequences its actions will have on the region as a whole. One of the most inappropriate motivations for a restricted parking program is to limit on-street parking near a rapid transit station while providing no alternative means of access. Residents living in the area want to recover their on-street spaces; yet, they will not authorize the construction of a substitute off-street parking facility for environmental reasons. Feeder transit to the station is inadequate for many of the displaced auto trips, and the sprawling land use pattern makes it difficult to upgrade the transit level of service at a reasonable cost.

The streets surrounding the BART stations in the suburban areas of San Francisco are filled with commuters' cars by 7:00 a.m. In order to encourage the use of transit access to these stations, San Francisco has refused to build parking garages. Yet, during the coming year several of these stations will be included in new residential parking permit programs. The existing feeder transit is not capable of providing a satisfactory level of service to many of these commuters who will no longer be able to park on the street, and no plans have been formulated to improve the transit service. Thus, persons who had formerly used their cars only for access to transit may soon be forced to abandon BART and drive to the San Francisco CBD. The same scenario has been repeated in Washington and Boston.

Similar negative effects can be expected to occur on business activity where off-street parking facilities do not exist. What is needed is a regional planning approach to obtain a balance among non-resident parking prohibitions, off-street parking garages, and upgraded feeder service. Since the implementation of off-street parking and transit feeder programs takes several years to accomplish, planning should begin at once in areas considering the widespread use of non-resident parking bans.

### 3. TRAFFIC RESTRAINT DEVICES IN RESIDENTIAL NEIGHBORHOODS

#### 3.1 Definitions and Issues

Neighborhood traffic restraints are physical or regulatory measures placed on residential streets to restrict or prevent the flow of through traffic. The projects of interest apply these measures systematically throughout residential neighborhoods in order to divert through traffic to the peripheral arterials. The specific devices used are detailed in Section 3.2.

## The Problem

The residential neighborhoods that have implemented traffic restraint schemes were all previously impacted by high volumes of through traffic which: created safety hazards, particularly for children and the elderly; degraded the residential environment with noise, air pollution and the visual invasion of autos; and, in many cases, caused disruption of the social life and cohesion of the neighborhoods and interfered with neighborhood activities. These negative effects have been shown to be related to the volume and speed of traffic on residential streets (see Reference 3).

Traffic management plans have been employed to eliminate these problems, to provide open space in which children may safely play, and to improve the physical appearance of the streets. These goals have to be balanced with the need to allow access for emergency, transit, and delivery vehicles, and to maintain access for residents and auto trips with destinations within the area.

The most severely impacted neighborhoods tend to be those which become convenient short cuts for commuters from outlying neighborhoods on their way to the city center or to an expressway. In older urban areas the main street containing the primary shopping and community functions is often also the arterial connecting several communities; thus heavy traffic passes through the heart of each area's activity center. Congestion built up on expressways and arterials can make residential streets into attractive bypass routes. Trucks, restricted from certain parkways may use neighborhood streets as their access routes creating particularly aggravating problems at night. Traffic lights on main roads can often be avoided by cutting through residential areas.

A regular grid pattern of streets tends to aggravate the problem since it creates no clear preferred routes and causes driver to choose a path of minimum congestion, which usually occurs on residential streets. By contrast, complex irregular residential street patterns will discourage entry by outsiders and discourage through movements. In a sense, many of the neighborhood traffic restraint schemes are designed to convert the former type of street pattern to the latter.

The inner city neighborhoods that usually bear the brunt of through traffic are often older, lower income residential areas. Most of these neighborhoods are battling against a number of pressures that in combination with the through traffic threaten their survival such as aging housing stock, changing populations, declining property values, lack of public services and encroaching real estate

development. As occurs in the Berkeley case study, most of the autos travelling through the area carry commuters from the farther, newer and wealthier suburbs. Thus, questions of social equity and related political debates often arise with neighborhood traffic restraint schemes.

### The Solutions

Three types of solutions could be considered:

1. Traffic restrictions which discourage the passage of autos through certain areas, with the primary effect of shifting the traffic to the periphery of such areas.
2. Changes in travel mode brought about by lowering the desirability of travel by private auto while raising that of public transit.
3. Changes in travel demand brought about by shifting land uses and activities in such a way that the need for now troublesome auto travel is eliminated altogether.

For a comprehensive discussion of these approaches and their effectiveness, see Reference 4.

Inducing a change in travel mode is greatly inhibited by the large discrepancy between the level of service for the automobile and for transit. Land use controls are relatively weak, and even the few policies that can be implemented are likely to be effective only in the long term. Thus, for practical purposes, traffic restraint schemes provide the only feasible alternative in the short run.

Most of the sites where residential neighborhood traffic restraint schemes have been implemented (see Table 2) are medium, rather than high, density areas and have wide grid street patterns where the initial increments of neighborhood traffic restraint can be implemented without causing major problems of congestion at the periphery. If neighborhood restraint schemes proliferate throughout the metropolitan area, their total effect may cause serious problems of concentrated congestion and long, circuitous trips.

Neighborhood traffic restraint programs set out to divert traffic from "inside" a neighborhood to its "periphery." This concept appears simple but in many cases identifying where "inside" and "periphery" are to be located is not. The "inside" is generally defined by some sense of physical cohesion, supplemented by a distinct social and political organization. The latter is essential for

shepherding the programs through the local political machinery. The "periphery" should be a traffic carrying channel that can accommodate additional bypass traffic without interfering with the activities that need to occur in its vicinity.

Since this periphery becomes the repository for unwanted traffic and thus for most potentially adverse impacts, it plays a controlling role in the feasibility of neighborhood traffic restraint schemes. If it is a wide street with few pedestrian oriented functions and only limited needs for crossing, then the diverted traffic will cause few problems. This is more likely to be the case in the relatively newer cities where such arterial roads were adapted to almost exclusively auto use from their initial development.

Problems are likely to arise in the older city patterns. In these cities the main arterials are also usually the "Main Streets" of commercial activity and community facilities. Pedestrian access to these facilities (such as shops and schools) is essential and cannot be sacrificed to increased traffic flow, and neighborhood activities often extend to both sides of such streets. In this type of urban fabric large residential traffic restraint districts are usually not feasible. Nevertheless it is often possible to shift the emphasis of different streets to different functions and create overlapping networks of pedestrian preference, local access, and through traffic streets (see Reference 5). This variant of the neighborhood traffic restraint scheme is more sympathetic to the denser, more continuous urban fabric but still assumes that traffic removed from one street can be appropriately diverted to another. If no streets capable (or willing) to carry the excess traffic exist, the solution must lie in the much more difficult areas of changing travel mode or travel demand.

#### Initiation and Implementation

As the two case studies in Section 3.4 illustrate, restraint schemes are usually initiated by a local organization responding to (or created by) residents troubled by the impacts of through traffic. If the organization can develop a sufficient consensus for the issues, it can usually get the City Government to provide technical assistance and adopt a program. Implementation usually begins with a demonstration scheme using temporary diverters. This is then evaluated, modified if necessary, and made permanent if found acceptable by the majority.

One successful neighborhood restraint scheme in a city is likely to create interest among many other residential areas impacted by traffic problems. At this stage the city may adopt a city-wide policy for initiating restraint

schemes. Technical assistance and implementation funds will then be provided to neighborhoods that show popular support for the idea. The Seattle case study describes such a program that has been operating since 1971.

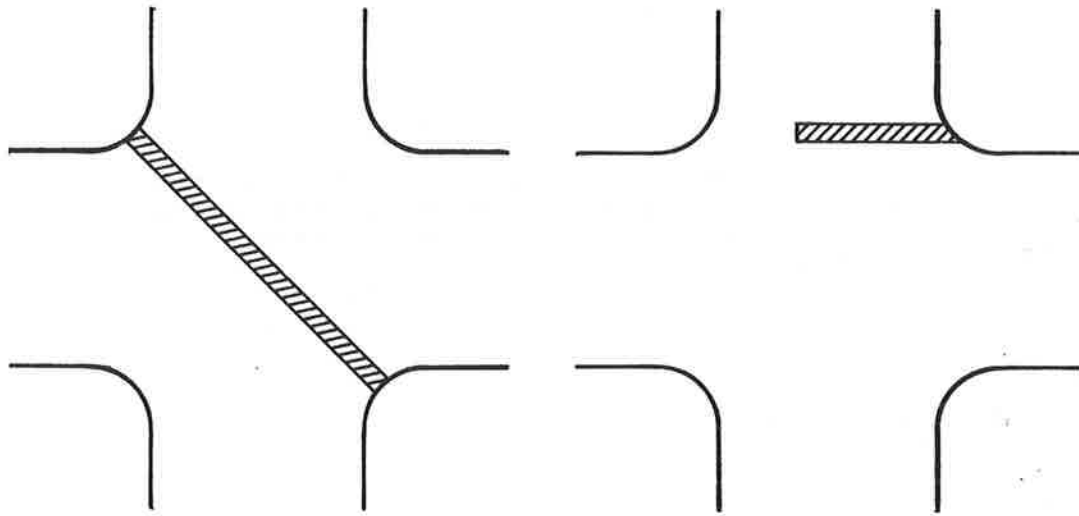
### 3.2 Traffic Restraint Devices

Traffic restraint devices are not new to the United States. Diagonal diverters and cul-de-sacs imposed on existing grid systems were implemented in Montclair, New Jersey in 1945, in Grand Rapids, Michigan in 1950 and in Richmond, California in 1958. The following traffic restraint devices are currently being employed in many American cities; diagonal and semi-diverters, cul-de-sacs, street closures, one-way streets to discourage penetration, "do not enter" signs, one-way maze, rumble strips, bumps, "stop" signs to slow or discourage traffic, narrowing of streets/chokers, traffic circles, traffic signals to redirect traffic, turn prohibition, forced turns, star diverters, median barriers, pedestrian signals, and no truck signing. Several of these devices are illustrated in Figure 3.1 The interested reader should consult Reference 6 for a more complete discussion of the topics of this section.

The appropriate device or set of devices depends on the community's needs and financial resources. The community should ask itself the following questions:

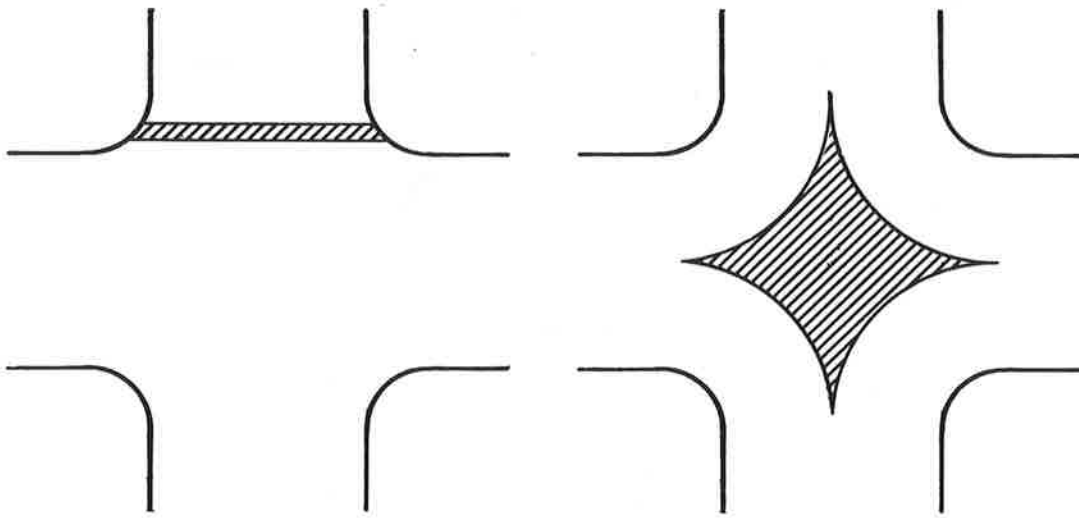
- Does it want the control to be external to the area or internal? While entrance barriers are easier to enforce than a maze of one-way streets, they reduce the accessibility of the area to neighborhood residents as well as to those passing through.
- What is the desired level of impact? A full barrier will cut off an area completely while a turn prohibition will merely reduce the flow.
- What amount of violation is tolerable, and what will be the enforcement levels? Physical barriers are self enforcing while signs are easily violated.
- Are the controls to be temporary (a few hours a day or on weekends) or permanent? This decision impacts the design and materials used.

The more restrictive physical controls have the advantage of being self-enforcing and of creating a visual impression that a street is not intended for through traffic. Disadvantages are the cost, the restriction of emergency and service vehicles, and the reduction in accessibility to the neighborhood by its residents. The



DIAGONAL DIVERTER

SEMI-DIVERTER



CUL-DE-SAC

STAR DIVERTER

FIGURE 3.1 PHYSICAL RESTRAINT DEVICES

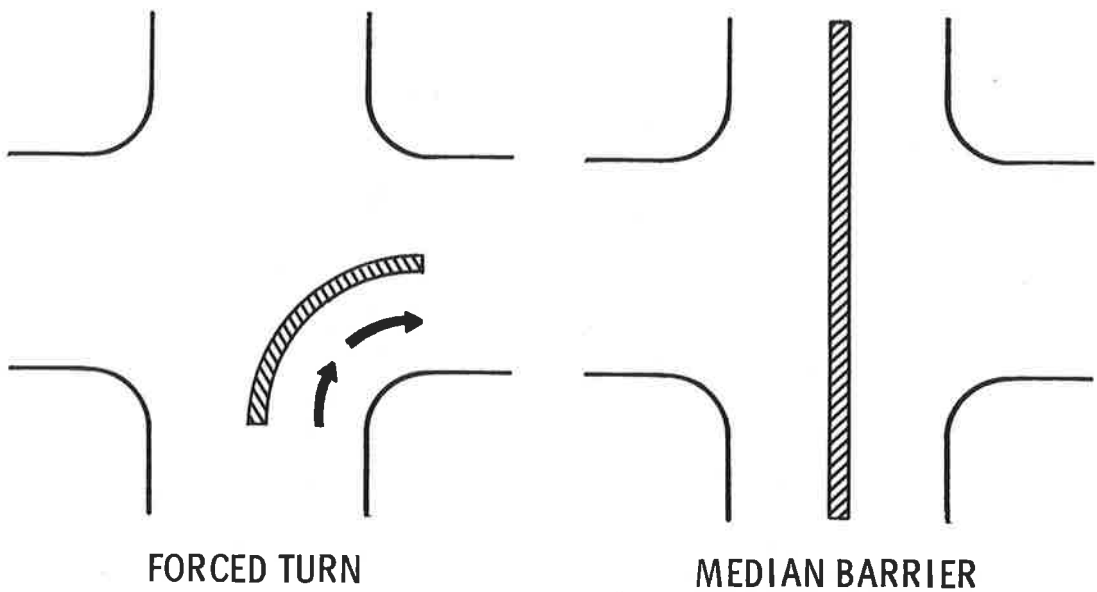
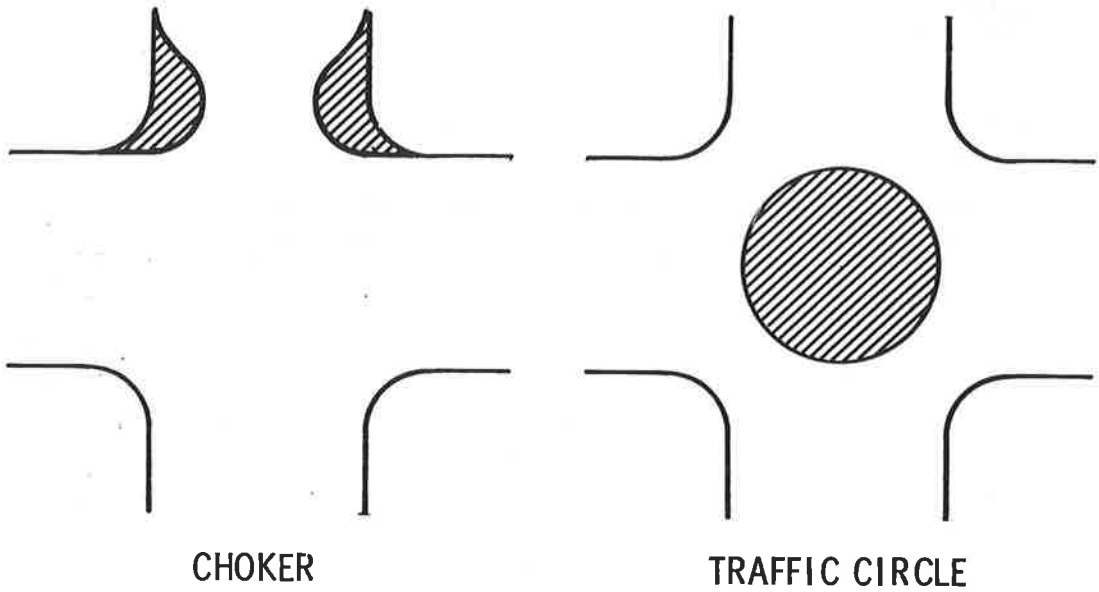


FIGURE 3.1 PHYSICAL RESTRAINT DEVICES (CONT'D).

following provides a brief summary of the most common physical controls used in American cities:

- Speed bumps and undulations - to reduce vehicle speed; problems with safety and noise to residents.
- Rumble strips - to alert drivers to control devices or to a dangerous condition such as a sharp turn.
- Diagonal Diverter - barrier placed diagonally across an intersection to convert it into two unconnected streets; makes travel through a neighborhood difficult, can be designed to permit emergency vehicles; temporary diverters may be asphalt berm, concrete blocks, wooden barricades, concrete bollards with connecting boards or chains, or street posts with reflective devices; permanent diverters may be standard steel guardrails, concrete barriers, or concrete or asphalt islands with or without landscaping; costs range from \$500 to \$2000 for temporary diverters and \$1000 to \$12,000 for landscaped ones.
- Intersection barrier of street resulting in a cul-de-sac - diverter blocking entrance to a street at an intersection but leaving the block open to traffic at the other end; types of construction and costs same as for diagonal diverter.
- Midblock cul-de-sac - barrier at midblock to allow access to midblock traffic generator; more convenient to residents but confusing to outsiders; type of construction and costs same as for diagonal diverter.
- Semi-diverter - barrier across half of the roadway; minimal impediment to emergency vehicles but easily violated; types of construction same as for diagonal diverters; costs range from \$300 to \$1200 for temporary semi-diverters to \$1,000 to \$8,000 for landscaped ones.
- Forced turn channelization - traffic islands specifically designed to prevent through traffic from passing through an intersection (e.g., the Seattle star diverter); makes travel on local streets difficult but does not prevent it; may be made of concrete blocks, asphalt berms, islands or pavement buttons; costs range from \$200 to \$1500 for berms and blocks to \$1000 to \$10,000 for islands.



- Median barrier - used to prevent traffic from turning from a major arterial onto a street passing through a residential neighborhood; may be raised concrete, concrete bars, asphalt berm, cement barrier or standard guardrail.
- Traffic circles - used to slow traffic; safety problems since vehicles come closer to pedestrians and bicycles, and vehicles may go in wrong direction to save time; temporary circles are made of barrels or concrete blocks, permanent ones of bollards or islands; costs range from \$500 to \$2000 for temporary ones and from \$7000 to \$10,000 for permanent ones.
- Chokers - narrowing of a street, either at an intersection or at mid-block; used to reduce traffic and to improve the appearance of the neighborhood; construction can be concrete bars, buttons, or concrete bulbs (existing curb extensions).
- Other physical control devices - play streets closed to traffic for a specific time period, signing (stop, speed limit, turn prohibition, one-way, do not enter, dead end, local access only, truck restrictions, etc.), and one-way street systems (to discourage entry or to create a maze).

### 3.3 Summary of American Experience

Minor traffic restraint devices, such as truck prohibitions and "do not enter" signs exist in many American residential neighborhoods. A number of communities, however, have instituted major comprehensive restraint schemes employing a combination of the more elaborate measures such as diverters, barriers, street closures, and one-way mazes. Table 3.1 summarizes the use of these devices in 37 American cities. Berkeley, Seattle, and Madison have the most extensive programs. Case studies of Berkeley and Madison are found in the next section. The most popular devices among the 37 cities are "stop" signs to slow or discourage traffic, diverters, and one-way streets and "do not enter" signs. These are followed in descending order of popularity by barriers forming cul-de-sacs, narrowing of streets or chokers, street closures, forced turns, one-way mazes, rumble strips and bumps, median barriers, turn prohibitions, traffic signals, traffic circles, and star diverters.

### 3.4 Case Studies

#### Berkeley, California

Berkeley, California is a 10.6 square mile older-style American city, eight miles to the northeast of San Francisco

TABLE 3.1 SUMMARY OF TRAFFIC RESTRAINT DEVICES IN RESIDENTIAL NEIGHBORHOODS

COMMUNITY	Diverter	Cul-de-Sacs/Barriers	Street Closures	One-Way Streets to Discourage Penetration or "Do Not Enter" Signs	One-Way Mazes	Rumble Strips	Bumps	Stop Signs to Slow or Discourage Traffic	Narrowing of Streets or Chokers	Traffic Circles	Traffic Signals to Redirect Traffic	Turn Prohibitions	Forced Turns	Stars	Median Barriers
Alexandria VA			X												
Berkeley CA	X	X		X				X	X		X	X			X
Beverly Hills CA								X							
Boston MA							X		X						
Buena Park CA								X							
Campbell CA		X													
Charlotte NC						X									
Cleveland OH			X		X							X	X		
Corpus Christi TX															
Davis CA	X		X					X							
Decatur IL	X			X				X	X				X		X
Detroit MI	X											X			
El Paso TX		X													
Formington UT		X					X	X							X
Hampton VA	X			X					X	X			X		
Isla Vista CA		X						X	X						
Jersey City NJ				X											
Kalamazoo MI								X					X		
Kansas City MO				X											
Lake Oswego OR	X			X	X										
Madison WI	X	X		X				X	X	X	X		X		
Newark NJ															
Norfolk VA												X			
Palo Alto CA	X	X						X	X						X
Rocky Mount NC			X	X	X			X				X	X		X
St. Joseph MI								X							
St. Louis MO	X	X	X	X	X										
St. Paul MN	X		X												
San Luis Obispo CA								X							
Santa Ana CA	X	X						X				X	X		
Santa Cruz CA								X							
Seattle WA	X	X		X			X	X		X				X	
Shaker Heights OH	X		X	X	X				X				X		
Springfield MA									X						
Torrance CA					X		X					X			
Visalia CA									X						
Wichita KA	X		X											X	
Number of Applications	14	10	8	11	6	1	4	17	10	2	3	7	8	2	5

across the San Francisco Bay. In 1970 the city's population was 117,000.

Most of Berkeley is on a grid system with major arterials and collector streets providing access to all areas of the city (see Figure 3.2). A freeway runs along the city's western boundary providing access to Oakland and San Francisco to the south and Marin County and the Napa Valley to the north. Berkeley is served by two BART rapid rail stations and numerous fixed route bus lines. The University of California on the eastern side of Berkeley is a major traffic generator.

Through traffic intrusion on local streets was a concern to residents in virtually all parts of the city except the northeastern hill neighborhoods where the population density is low and the street pattern is not a grid. Berkeley began its neighborhood traffic management plan in 1964 with the installation of several diverters in the San Pablo Park neighborhood in the southwest section of the city. These diverters were fully landscaped and meant to upgrade the appearance of this low-income neighborhood as well as decrease through traffic. During the next few years several more diverters were installed throughout the city.

Based on the initial success of the diverters, Berkeley hired a group of consultants in 1972 to develop a coordinated traffic management plan for the entire city. Their work consisted of traffic studies, meetings with neighborhood groups, publication of an "Issues Report," a postcard survey, public meetings for final neighborhood review, and the publication of a final report (Reference 7) in 1974. The plan called for the installation of a large number and a variety of traffic management devices including diverters, islands, stop signs, and chokers throughout the city. The plan and the cost (in 1974 dollars) is summarized in Table 3.2.

The Berkeley Traffic Management Plan proposed by the consultants was implemented in August 1975 on a trial basis which ended on May 31, 1976. In May 1976 a report was produced on the effects of the plan (Reference 8). The report summarized the major findings as follows:

- Changes in traffic volume have occurred generally as expected. Traffic on most local streets has decreased or remained unchanged. Traffic on some arterials and collector streets has increased. A few local streets, generally short segments in the vicinity of diverted streets which formerly carried substantial traffic, have suffered traffic increases. Several arterial and collector streets have benefited from the Traffic Management Plan and experienced traffic decreases. Generally these have been streets of residential character



FIGURE 3.2 BERKELEY, CALIFORNIA TRAFFIC CONTROL PLAN

TABLE 3.2

BERKELEY TRAFFIC MANAGEMENT PLAN

<u>Quantity</u>	<u>Item</u>	<u>Cost Each</u>	<u>Total Cost</u>
6	Signals	\$35,000	\$210,000
74	Diverters	500-2250	128,250
3	Signal Modifications	5000-15,000	25,000
39,900 ft.	Striping	.27 to 1.00/ ft.	13,830
4,450 sq. ft.	Concrete and Asphalt Islands	2.50/ft.	11,130
179	"Stop" Signs	30-50	6,090
9,400 sq. ft.	Paint and Bar Islands	0.43/sq.ft.	4,040
10	Chokers	400	4,000
83	Pavement Markings	10-40	2,900
66	Signs (Other than "stop")	30	<u>1,980</u>
		Subtotal	\$407,220
		Contingencies @ 10%	<u>40,780</u>
		TOTAL	\$448,000

while most of the arterial streets experiencing increase are non-residential or of mixed land-use in character.

- Traffic increases on the arterial and collector streets have not caused serious increases in congestion. Current capacity utilization ratios at key intersections are improved over those measured in 1970. Traffic operations improvements carried out in the intervening period have absorbed the impacts of Traffic Management Plan induced shifts as well as normal traffic growth.
- Overall travel times in Berkeley along the designated circulation system have not changed significantly from pre-Traffic Management Plan conditions. However, elimination of through-neighborhood shortcuts has caused increases of overall travel time on many trips. The seriousness of this change depends on whether one is travelling in an emergency situation or simply a matter of personal convenience.
- Traffic accidents and traffic fatalities in the City are down over the period the Traffic Management Plan has been in effect though injury accidents are up slightly. Along with traffic volume, the Plan appears to shift many of the accidents which formerly occurred in neighborhoods to the bounding arterial streets. Instances of vehicles striking traffic management devices have decreased as people have become familiar with the Plan. As familiarity increases and devices are better marked, this is likely to become even less of a problem.
- There is considerable disobedience of all types of traffic management devices deployed in the City. Violation of diverters, semi-diverters and closures occurs regularly and should perhaps be the subject of increased police enforcement. However, violations are not so frequent as to impair the effectiveness of these devices or to warrant development of more sophisticated provisions for emergency vehicle gaps.

The undercarriage preventer blocks which guard emergency vehicle openings against violators are generally successful in discouraging violations. However, they can be crossed by high-slung vehicles and many private cars, if driven with care. They have damaged a few police vehicles during high speed crossings. In the absence of increased enforcement, the blocks appear the best

compromise between unprotected emergency openings and fully closed diverters.

Violation of circles (left turns on wrong side of circle) is frequent and involves a serious accident potential--one reason why replacement of several circles is recommended herein.

Violation of "stop" controls - failure to stop - is flagrant at many locations. Placement of "stop" controls at intersections where there is perceptually little need to control right-of-way appears to have bred driver contempt and hazardous disregard for this device. Most of the obviously inappropriate "stop" controls incorporated in the Plan were never installed or have been removed. Large scale occurrence of hazardous violations is one of the reasons for recommendations herein which indicate removal of all "stop" controls which have been placed for valid right-of-way control purposes.

- "Stop" controls have had very limited effect in reducing traffic speed except in the immediate vicinity of the device itself. This is another reason for the removal recommendation above.
- Modifications to many of the devices deployed in the initial Traffic Management Plan implementation could improve their visibility and functional qualities.
- Air quality in the Bay Area as a whole, citywide in Berkeley, or on individual Berkeley streets has not been meaningfully impacted by Traffic Management Plan implementations.
- Insufficient data is available to quantify changes in energy (gasoline) consumption resulting from Plan implementation. However, in all probability, gas consumption has increased for many trips still made in Berkeley.
- The Traffic Management Plan has had a range of effects on community services operating in Berkeley. Among these are:
  - Little discernible effect on AC Transit operations.
  - Refuse collection service routings have been revised with little quantified effect on operation efficiency. On at least one cul-de-sac, Tanglewood, the collection truck must back out one block after collections.

- Adjustments to Berkeley Unified School District bus routes have enabled continued fulfillment of school transportation requirements. However, such route adjustments are estimated to cost \$10,000 for the current school year.
- Adjustments to the school crossing protection plan will be needed primarily due to changes in attendance because of the earthquake safety rehabilitation program. The Traffic Management Plan should be taken into account in such adjustments.
- Vandalism on diverters and related devices cost some \$6,700 for repairs in the first six months of Plan implementation. Repeated vandalism of two devices accounted for nearly two-thirds of all vandalism.
- No catastrophic incidents resultant from Traffic Management interference with fire protection services have been reported but the Fire Department is concerned that the risk of serious incidents may be overlooked. A specific design criteria for the Traffic Management Plan was mobility of fire protection apparatus. However, emergency access openings have been blocked by parked cars or apparatus otherwise delayed by Traffic Management devices on at least five occasions since the Plan implementation. Several new hydrant installations will be required if certain diverters are made permanent. If the Plan is continued, measures should be taken to ensure the quality of fire protection services in Berkeley.
- Crime statistics and police response time data provide no substantiation that the Traffic Management Plan has adversely affected the overall quality of police services in Berkeley. However, individual incidents and perceptions of patrol officers indicate potential for problems. Increased manpower and resource allocation to the Patrol Division could offset potential adverse effects of the Plan and lead to better traffic enforcement.
- Numerous citizen communications regarding Traffic Management have been received regarding the Plan both before and after implementation. The balance of citizen view on Traffic Management, pro or con,



cannot be judged on the basis of communications received. However, these communications have been of great value in pointing up issues of concern related to the Plan and suggestions for specific device modifications.

The plan generated considerable controversy. Persons living in the low-lying residential areas, who suddenly found their streets free from through traffic, were delighted. By contrast, persons living in the affluent northeast hills section, who had grown accustomed to taking short-cuts through these now-protected neighborhoods to get to work, shopping or the freeway, were dead-set against the plan. Opponents of the plan placed a "diverter initiative" on the June 1976 ballot that could have removed all diverters had it passed. However, it failed by a vote of 26,000 to 20,000. The areas that voted to eliminate the diverters were the northeast hills section, the southwest San Pablo Park neighborhood, and a few other fringe neighborhoods. Strongest support for the plan was, as expected, in the well protected central neighborhoods.

Following the evaluation report and the election, a few minor changes were made to the plan, and the City Council declared it a success. A second initiative to remove the diverters was placed on the ballot in April 1977, but it, too, was defeated.

To this day the controversy goes on. People living on residential streets that had been designated as arterials are angry, and the police department finds that the diverters interfere with their duties. Some people still have not grown accustomed to the new street pattern and end up having to back out of unsuspected cul-de-sacs. There is a court case pending to remove the diverters. Yet, for every opponent there appears to be at least one proponent, and the traffic restraint plan remains in place.

Residents complain about the appearance of the diverters, which are for the most part cement bollards connected by wooden beams. The City would like to replace them with permanent landscaped ones, but the cost would be from \$10,000 to \$30,000 for each diverter. The total cost to make the system permanent would be from \$500,000 to \$2.5 million.

#### Seattle, Washington

Seattle, Washington has been implementing neighborhood traffic management schemes on a neighborhood by neighborhood basis since 1971 (References 9 and 10). Since most of the city's residential subdivisions are plotted in grid configuration, vehicle restrictive devices were needed to channel vehicles onto the major arterials which are spaced at one-half mile intervals. In 1968 Seattle voters approved

a bond issue for neighborhood improvement program funds that can be used to pay for traffic management schemes.

Seattle has developed a sequence of procedures that must be followed before a traffic management device may be installed. A request for a traffic management plan must be made by a neighborhood resident or group of residents and have the approval of a majority of the neighborhood property owners. This is followed by a traffic study performed by the City's Engineering Department, public meetings, a proposal for the demonstration, a survey of all neighborhood residents, a demonstration period where temporary control devices are installed, a second neighborhood survey, more public meetings, and finally a decision by the City Council whether or not to make the plan permanent.

Residents from the Stevens Neighborhood were the first to petition the City in 1971 to develop a traffic control plan to alleviate the excessive traffic, vehicle speeds and accidents in their 12 block neighborhood. The Stevens Neighborhood area, which is nearly all single family homes, is bordered by arterial streets (see Figure 3.3); yet, commuters and persons accessing the adjacent park found it more convenient to use the interior streets.

Following the planning sequence outlined above, a demonstration scheme consisting of four temporary diagonal diverters was installed in September 1971. The control devices were sand-filled 50 gallon drums connected by wooden rails. In March 1973, following the review process, a permanent diversion system was installed at a cost of \$38,000. The plan was modified to include two traffic circles, a diagonal diverter, a partial diverter, and two traffic "bulges," acting as semi-diverters (see Figure 3.4).

An evaluation was performed (Reference 11), and most of the measured impacts were positive: traffic was reduced from 25 to 50 percent; accidents fell from 12 per year to .5 per year; traffic volume or accidents did not change on adjacent arterial streets; vehicles were only slightly inconvenienced; the neighborhood is quieter and residents have developed a stronger identity; and the environmental values were enhanced. The only detrimental effects were confusion to people unfamiliar with the control devices and slightly longer driving routes for some of the residents and service and emergency vehicles.

As a result of the success of the Stevens Neighborhood project, Seattle has installed vehicle control plans in at least seven other locations (References 12, 13, 14, 15, 16, and 17). These plans include diagonal diverters, barriers to create cul-de-sacs, "stop" signs to slow traffic, circles, star diverters, and a bridge closing. Experience has shown that traffic circles have only a minor influence on the traffic volume and divert only a moderate amount of

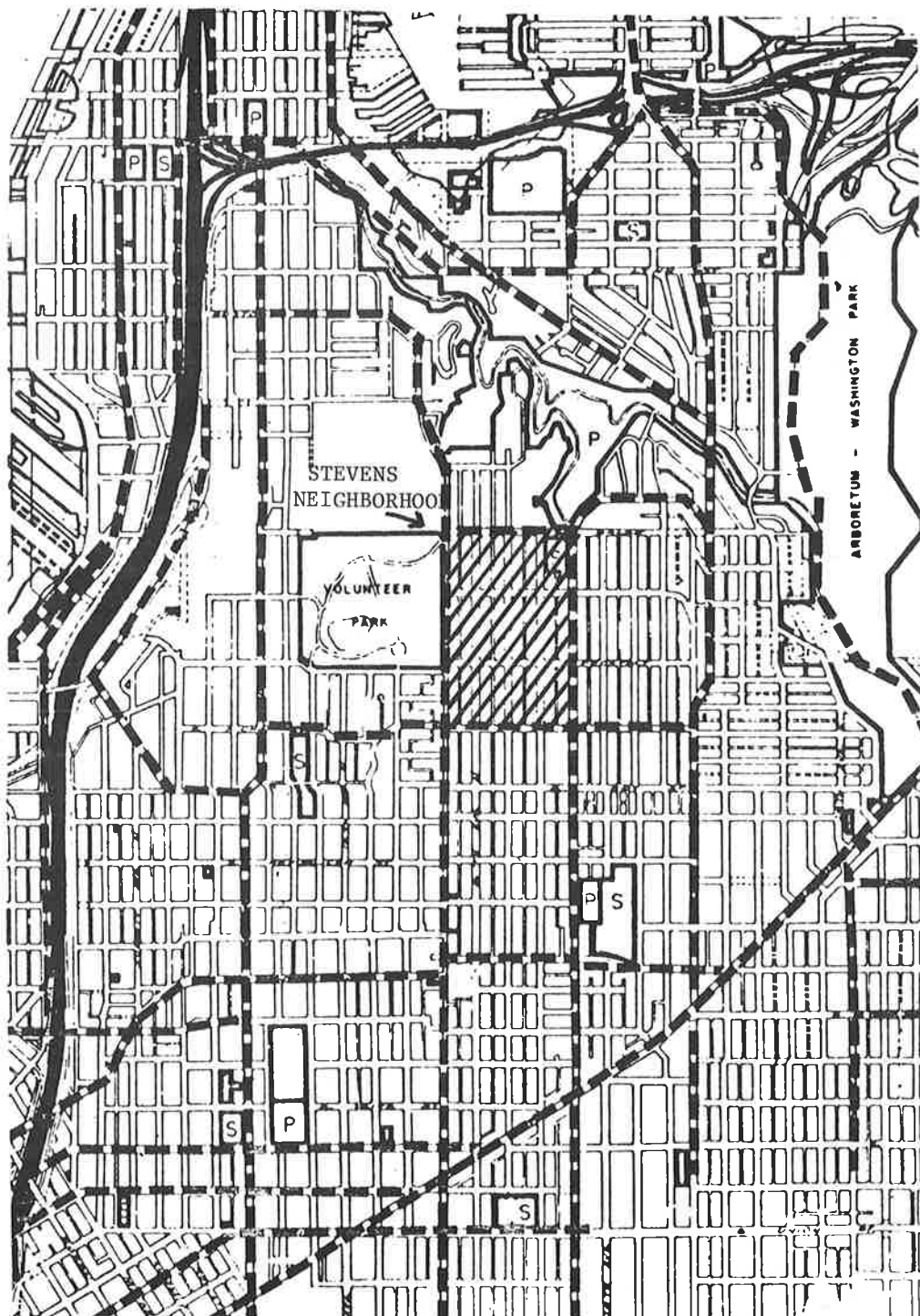


FIGURE 3.3 SEATTLE, WASHINGTON AND THE STEVENS NEIGHBORHOOD

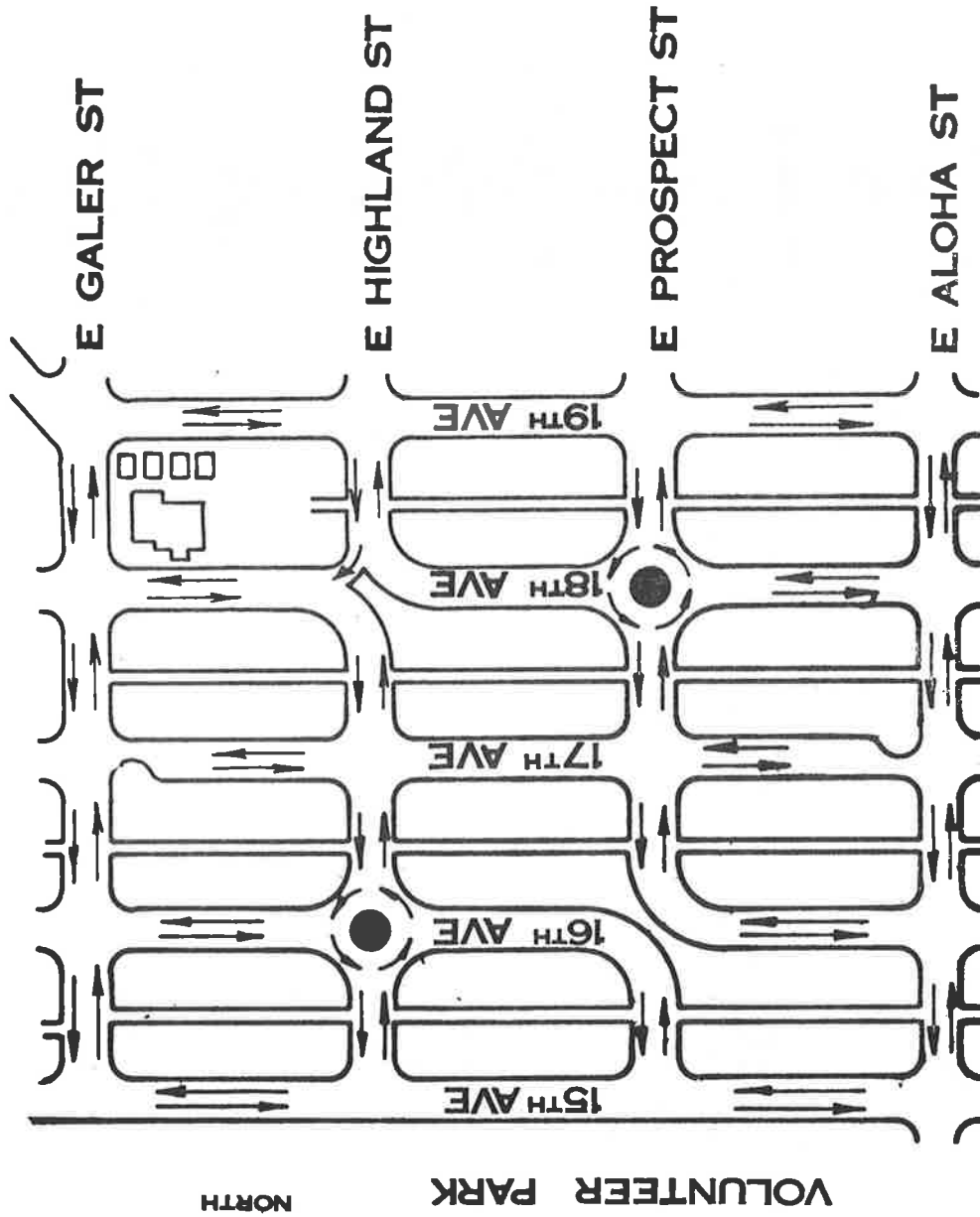


FIGURE 3.4 STEVENS NEIGHBORHOOD PERMANENT TRAFFIC RESTRAINT PLAN

traffic to other streets. In many cases they have been installed as a first step in a traffic management plan. Cul-de-sacs and traffic diverters, including star diverters, have had a more significant effect on speed and traffic volumes. Seattle has found that star diverters should not be used unless there is sufficient intersection area and roadway width to permit an installation that would include adequate extension (such as a median) to force right turns. Otherwise, they will be constantly violated. "Stop" signs were found to have no effect on vehicle speeds.

As a result of the careful planning and implementation process described above, the final restraint schemes have been very popular among the residents. The one time that the control devices were installed on a permanent basis without an evaluation period resulted in several costly modifications when flaws were discovered in the plan. Seattle recommends that all traffic control devices be installed on a temporary, experimental basis so that they can be adequately evaluated and modified before they are made permanent.

### 3.5 Traffic Restraint Conclusions

Most of the neighborhood traffic restraint schemes implemented in the United States have occurred in relatively less dense cities (see Table 3.1). These cities usually have a grid street pattern and sufficient reserve street capacity to accommodate the diverted traffic without causing serious congestion. In the cores of the denser, older cities such as New York, Boston or Philadelphia no such district-wide programs have been tried.

Both case study cities fall into the relatively low density category. The impacts obtained under these conditions produced no major surprises. As predicted in the planning studies, local street traffic decreased considerably on the streets with the restraining devices. Arterial traffic increased slightly on the periphery of the neighborhoods, but these increases could be handled with relatively minor (and thus low cost) traffic management devices and caused no serious adverse impacts. Changes in overall travel times were minor but seemed significant to those who lost their accustomed shortcuts. Actual impacts on public services and deliveries were minor but caused some stress among those who objected to the forced adjustment. The accident rate decreased dramatically in Seattle while Berkeley reported some collisions with the traffic management devices and continuing vandalism and confusion. While no systematic studies of changes in neighborhood perception, cohesion and activity pattern are available, the Berkeley residents living on the non-traffic streets have been pleased with the results, and the Stevens neighborhood in Seattle reported improvements of all these factors.

All of the traffic restraint projects relied strongly on local initiative by the affected neighborhoods. The neighborhoods provided the political pressure while the city government supplied technical assistance. The partnership of these two elements was generally carried through the planning, review, demonstration, evaluation and permanent implementation stages. Generally the organized and concentrated political support of the neighborhood (often in alliance with other neighborhoods with similar programs) has prevailed over the more diffused opposition of those who may have been inconvenienced. In some cases this latter group consisted of commuters from outside the municipality who had no political leverage in decisions controlled by the city. Even in Berkeley where the main opposing group was located inside the city, the traffic restraint program survived two successive popular referenda.

The compensatory programs at most sites were limited to relatively minor traffic management measures. These appear to have been sufficient due to the traffic carrying capacity of the street system.

As neighborhood traffic restraint devices gain widespread use (as is occurring in Seattle) or are introduced more comprehensively in denser, more congested areas, the impact of displaced traffic and the measures required to deal with it will change. At some threshold point, which will vary with the local conditions, congestion will increase to the point that major compensatory programs will be required. These may be one of two types:

1. Substantial increase in traffic capacity through road building or widening.
2. Traffic reduction through substantial shift to public transit or carpooling.

The neighborhood traffic restraint schemes are highly suited to the prevailing planning and political styles of American cities. Such schemes can be identified with the interests of a specific constituency that can effectively lobby for them through local politicians. They are relatively inexpensive and can be implemented quickly. For these reasons they have been gaining in popularity during the past several years.

By contrast, once the threshold mentioned above is reached, the required compensatory measures are costly, complicated to plan and implement, and have long lead-times. Thus, it is very likely that in most instances long periods (probably several years) will elapse between the time the need for compensatory measures emerge and the time such measures begin to effectively operate to relieve congestion. The continuing stress during this period could create

reaction and reversal of some of the neighborhood traffic restraint schemes.

The conclusion, however, should not be excessive caution against neighborhood traffic restraints. Due to their politically viable nature, these, in combination with the parking restraints discussed in the first half of this paper, may be some of the most effective initial steps for shifting American commuters from autos to public transit. The difficulty lies in improving the transit alternative fast enough so that when the pressure of induced congestion builds up the shift to transit occurs naturally and pressures for road building or reversal of the restraints are avoided.





APPENDIX A

ARLINGTON COUNTY, VIRGINIA  
ZONING ORDINANCE

(as contained in the appendix of the Arlington County Code)

D. RESTRICTIONS ON PARKING IN DISTRICTS IN WHICH  
COMMERCIAL AND INDUSTRIAL USERS ARE NOT PERMITTED

1. Whenever the County Manager or his designee shall determine that the streets of a particular district or discrete portion of a district in which residential users are permitted and commercial and industrial use are not permitted, except transitional uses or by conditional use permit are being used for parking by the operators of vehicles while the operators of those vehicles are using districts in which commercial or industrial uses are permitted or portions of districts in which Conditional Special Uses have been permitted under Section 3.A9 a-c of the Zoning Ordinance and the average number of vehicles parking in such a manner is in excess of 25% of the number of parking spaces on such streets and the total number of spaces actually occupied by any vehicles exceeds 75% of the number of spaces on the weekdays of any month, as disclosed by an engineering study, the County Manager or his designee shall prohibit parking during the hours when such use has been found on those streets of those districts or portions of districts found by the survey to have been so affected. In such cases the county manager shall cause appropriate signs giving notice of the prohibition to be posted on those streets restricting all parking except parking by the holders of permits to be granted only under the following conditions.
  - a. To persons who are residents of any particular area in which parking is so restricted, to be limited to that particular area in which parking is so restricted for every vehicle owned by those persons and registered in the County.
  - b. To persons who are visitors of any residents of any particular area in which parking is so restricted, to be limited to the particular area in which parking is so restricted, to be valid for a stated period but no more than 30 days, and not to be any more than two persons who are visitors at a residence during any period in which another visitor to that residence holds such a permit; and

- c. to persons who do business with any residents of any particular districts in which parking is so restricted during the hours of restriction, to be limited to that particular area or areas which parking is so restricted and in which such person so transacts business.

However, the parking prohibition of this Section 33, Subsection D shall not apply to service of delivery vehicles which are being used to provide services or make deliveries to dwellings.

On the application of any resident to the district, the Chief of Police or his authorized designee may issue permits to be valid for only one day and for no more than four hours on that day upon a showing by the resident that during the hours for which the permits are to be issued, his residence will be used in such a way consistent with its residential character and other provisions of law that visitors to his residence would not be able to park without violating the law. If the Chief of Police shall find the foregoing facts and further find that the issuance of the permits will not unduly impair traffic safety during the time of their validity, he shall issue such permits and may limit the streets or portions of streets on which they shall be valid. The number of such permits shall not at any time exceed 50% of the number of spaces in which they are valid.

2. Any such person shall show to the County manager or his authorized representative satisfactory evidence that he fulfills all the conditions for such a permit. Whenever the conditions no longer exist, the persons holding such a permit issued under subparagraph 1(a) or 1(c) shall surrender it to the County Manager or his authorized representative. It shall be unlawful for any person to represent that he is entitled to such a permit when he is not so entitled, to fail to surrender a permit to which he is no longer entitled, or to park a vehicle displaying such a permit any time when the holder of such permit is not entitled to hold it. No permit issued hereunder shall be valid for more than one year, but may be renewed upon expiration, provided the condition for issuance exist.
3. The signs placed in such areas shall be of such character as to inform readily an ordinarily observant person of the existence of the rules and regulations imposing the foregoing restrictions.

It shall be unlawful for any persons to violate such rules and regulations.

4. Wherever metered parking is in effect in any portion of a district that becomes subject to the restrictions of this paragraph D, the parking spaces controlled by meters may be excepted from the provision of this paragraph so long as the control by meters continues.
5. Nothing in this Section 33, Subsection D shall repeal or supersede any other provision of law which provides authority to regulate parking.

APPENDIX B

SUPREME COURT DECISION - COUNTY BOARD OF ARLINGTON COUNTY,  
VA, ET AL., V. RUDOLPH A. RICHARDS, ET AL.

No. 76-1418.

Oct. 11, 1977.

Action was brought for a judgment declaring invalid a county ordinance authorizing permit parking on certain public streets in residential areas. The Virginia Supreme Court, 217 Va. 645, 231 S.E.2d 231, affirmed a judgment declaring the ordinance invalid and county sought certiorari. The Supreme Court granted certiorari and held that a county ordinance directing the county manager to determine those residential areas especially crowded with parked cars from outside the neighborhood and authorizing the issuance of free parking permits to residents of designated areas, to persons doing business with residents there and to some visitors, but denying permits to all other persons, did not deny equal protection.

Reversed and remanded.

Mr. Justice Marshall would have granted the petition for certiorari and set the case for oral argument.

1. Automobiles ⇐7

Constitutional Law ⇐235

County ordinance directing county manager to determine those residential areas especially crowded with parked cars from outside neighborhood and authorizing issuance of free parking permits to residents of designated areas, to persons doing business with residents there and to some visitors, but denying permits to all other persons, did not deny equal protection. U.S.C.A.Const. Amend. 14.

2. Constitutional Law ⇐235

To reduce air pollution and other environmental effects of automobile commuting, community reasonably may restrict on-street parking available to commuters, thus encouraging reliance on car pools and mass transit, and community may also decide that restrictions on flow of outside traffic into particular residential areas would enhance quality of life, thereby refusing noise, traffic hazards and litter, and such restric-

tions would not violate equal protection. U.S.C.A.Const. Amend. 14.

3. Constitutional Law ⇐213.1(2)

Equal protection clause does not presume distinctions between residents and nonresidents of local neighborhood to be invidious, but requires only that distinction rationally promote objectives of regulation. U.S.C.A.Const. Amend. 14.

PER CURIAM.

The motion of D. C. Federation of Civic Associations, et al., for leave to file a brief, as *amici curiae*, and the petition for a writ of certiorari are granted.

To stem the flow of traffic from commercial and industrial districts into adjoining residential neighborhoods, Arlington County, Va., adopted zoning ordinance § 29D. The ordinance directs the County Manager to determine those residential areas especially crowded with parked cars from outside the neighborhood.<sup>1</sup> Free parking permits are then issued to residents of the designated areas for their own vehicles, to persons doing business with residents there, and to some visitors. To park an automobile without a permit in a restricted area between 8 a. m. and 5 p. m. on weekdays is a misdemeanor.

Acting under the ordinance, the County Manager designated a restricted area in Aurora Highlands, a residential neighborhood near a large commercial and office complex. Commuters who worked in this complex and had regularly parked in the area sued in the Circuit Court of Arlington County to enjoin the enforcement of the ordinance on state and federal constitutional grounds. The Virginia Supreme Court ultimately held that the ordinance violated

1. This condition is met when "the average number of vehicles [operated by persons whose destination is a commercial or industrial district] is in excess of 25% of the number of parking spaces on such streets and the total number of spaces actually occupied by any vehicles exceeds 75% of the number of spaces on such streets on the weekdays of any month

the Equal Protection Clause of the Fourteenth Amendment.<sup>2</sup>

As stated in its preamble, the Arlington ordinance is intended

“to reduce hazardous traffic conditions resulting from the use of streets within areas zoned for residential uses for the parking of vehicles by persons using districts zoned for commercial or industrial uses . . . ; to protect those districts from polluted air, excessive noise, and trash and refuse caused by the entry of such vehicles; to protect the residents of those districts from unreasonable burdens in gaining access to their residences; to preserve the character of those districts as residential districts; to promote efficiency in the maintenance of those streets in a clean and safe condition; to preserve the value of the property in those districts; and to preserve the safety of children and other pedestrians and traffic safety, and the peace, good order, comfort, convenience and welfare of the inhabitants of the County.”

Conceding the legitimacy of these goals, the Virginia Supreme Court found that the ordinance’s discrimination between residents and nonresidents “bears no reasonable relation to [the regulation’s] stated objectives,” and, therefore, that “the ordinance on its face offends the equal protection guarantee of the 14th Amendment.” 217 Va. 645, 651, 231 S.E.2d 231, 235. We disagree.

[1, 2] To reduce air pollution and other environmental effects of automobile commuting, a community reasonably may restrict on-street parking available to commuters, thus encouraging reliance on car

2. Although the state trial court found the ordinance invalid under the State and Federal Constitutions, the State Supreme Court rested its decision solely on the Equal Protection Clause of the Fourteenth Amendment.
3. Restrictions on nonresident parking have sparked considerable litigation. See, e. g., *South Terminal Corp. v. Environmental Protection Agency*, 504 F.2d 646, 671–676 (CA1) (restrictions upheld); *Friends of the Earth v. Environmental Protection Agency*, 499 F.2d 1118, 1125 (CA2) (restrictions upheld); *Massachusetts v. Petralia*, 362 N.E.2d 513 (1977) (restrictions upheld); *Ohio v. Whisman*, 24 Ohio Misc. 59, 263 N.E.2d 411 (Ct. of Com. Pleas, Scioto Co. 1970) (restrictions invalidated); *Georgetown Assn. of Businessmen v. District of Columbia*, Civ. No. 7242–76, D.C. Super. Ct., Aug. 9, 1976 (restrictions preliminarily enjoined). The United States as *amicus curiae* notes that parking restrictions to discourage automobile commuting have been recommended by the Environmental Protection Agency to implement the Clean Air Amendments of 1970. See 38 Fed. Reg. 30629.

pools and mass transit. The same goal is served by assuring convenient parking to residents who leave their cars at home during the day. A community may also decide that restrictions on the flow of outside traffic into particular residential areas would enhance the quality of life there by reducing noise, traffic hazards, and litter. By definition, discrimination against nonresidents would inhere in such restrictions.<sup>3</sup>

[3] The Constitution does not outlaw these social and environmental objectives, nor does it presume distinctions between residents and nonresidents of a local neighborhood to be invidious. The Equal Protection Clause requires only that the distinction drawn by an ordinance like Arlington’s rationally promote the regulation’s objectives. See *New Orleans v. Duke*, 427 U.S. 297, 303, 96 S.Ct. 2513, 2516, 49 L.Ed.2d 511, *Village of Belle Terre v. Boraas*, 416 U.S. 1, 8, 94 S.Ct. 1536, 1540, 39 L.Ed.2d 797. On its face, the Arlington ordinance meets this test.

Accordingly, the judgment is set aside, and the case is remanded for further proceedings not inconsistent with this opinion.

*It is so ordered.*

Mr. Justice MARSHALL would grant the petition for certiorari and set the case for oral argument.



ations upheld); *Ohio v. Whisman*, 24 Ohio Misc. 59, 263 N.E.2d 411 (Ct. of Com. Pleas, Scioto Co. 1970) (restrictions invalidated); *Georgetown Assn. of Businessmen v. District of Columbia*, Civ. No. 7242–76, D.C. Super. Ct., Aug. 9, 1976 (restrictions preliminarily enjoined). The United States as *amicus curiae* notes that parking restrictions to discourage automobile commuting have been recommended by the Environmental Protection Agency to implement the Clean Air Amendments of 1970. See 38 Fed. Reg. 30629.

## APPENDIX C

### PARKING POLICIES IN FORTY COMMUNITIES

**ARLINGTON COUNTY, VA**

**Curbside Ban** Due to a shortage of parking in the county, curbside bans are only used on very narrow streets, and only apply to one side.

**Limits on Consecutive Parking Hours** Residential communities bordering employment and shopping centers may have 1 and 2 hour restrictions.

**Alternate Side Requirements During Day time** Alternate side requirements were instituted after a Virginia State court initially struck down the permit system (subsequently upheld by the U.S. Supreme Court - Appendix A.) The regulations are still in force in some areas; however, the county will consider substituting the permit system if residents request it. The changeover time may be at 10:00 a.m. or 2:00 p.m. and the intent is to prevent all-day parking.

**Non-resident Prohibition** A residential parking permit program is currently in effect in a 14 block area near Crystal City, VA. (This program was contested all the way to the U.S. Supreme Court where it was upheld.) Major employment centers in Crystal City were creating excess parking demand in nearby neighborhoods. County officials felt the metro stop provided an alternative to driving and that the parking ban would not create an unreasonable burden. It was also observed that many drivers were simply avoiding parking charges in commercial lots. The program has successfully alleviated the problem and additional sites in the county for RPPPs are now under consideration.

**ATLANTA, GEORGIA**

**Curbside Ban** If residents request no parking regulations, or if the city feels the street is too narrow to accommodate traffic and parkers, bans may be instituted on one or both sides.

**Limits on Consecutive Parking Hours** In select areas near the CBD and heavily used transit stops, the city has prohibited parking between 9:00 a.m. and 11:00 a.m., and 2:00 p.m. and 4:00 p.m. This policy prevents all day parking and is generally well received by the residents. (The community initiates the request for parking restrictions.)

**Alternate Side Requirements During Daytime** None

**Non-resident Prohibition** None

**BALTIMORE, MARYLAND**

**Curbside Ban** Curbside parking bans are in effect during peak traffic hours on major arterials traversing residential areas.

**Limits on Consecutive Parking Hours** See alternate side below

**Alternate Side Requirements During Daytime** Temporary and changeable signs are used around a sports stadium and racetrack to prevent all-day parking when events occur. For example, parkers are prohibited on one side from 12:00 a.m. to 3:00 p.m. and on the other side from 3:00 p.m. to 6:00 p.m.

**Non-resident Prohibition** The city attempted to install a residential parking permit program. Commuters sued and the city was enjoined. The case is currently being processed and a decision is expected by mid-March. Residents had requested the program due to parking congestion caused by a nearby hospital and transit station. Other reasons were deteriorating air quality and noise.

**BERKELEY, CALIFORNIA**

**Curbside Bans** None

**Limits on Consecutive Parking Hours** None

**Alternate Side Requirements During Daytime** None

**Non-resident Prohibition** None

BOSTON, MASSACHUSETTS

Curbside Ban Parking is prohibited on certain through streets to promote traffic flow.

Limits on Consecutive Parking Hours A city-wide ordinance limits parking to two hours on all streets not otherwise regulated. Residents are exempt from this restriction and may obtain parking permits from city hall. Neighborhood boundaries have been established and a resident's exemption is only valid in the area near his home. One residential section permits free resident parking at certain meters. Much of Boston's development occurred before wide-spread auto ownership. Computers to employment centers, government offices, and rapid transit lines create enormous parking demands.

Alternate Side Requirements During Daytime None

Non-resident Prohibition See limits on consecutive parking hours above.

BRONX-NEW YORK CITY, NEW YORK

Curbside Ban None

Limits on Consecutive Parking Hours Meters are used on many residential streets abutting commercial areas.

Alternate Side Requirements During Daytime Alternate side parking restrictions are in force on one side from 7:00 a.m. to 11:00 a.m. and then change to the other side from 11:00 a.m. to 2:00 p.m. The effect is to prevent all-day parking as few commuters can move their cars during mid-morning. The restricted side is alternated daily. Residents effectively have first shot at permissible parking between 7:00 a.m. and 11:00 a.m. by virtue of having moved their car the day before.

Non-resident Prohibition None

BUFFALO, NEW YORK

Curbside Ban During the wintertime, overnight parking is prohibited on bus routes in residential areas (to permit snow removal). In older sections of the city, inadequate off-street parking creates supply problems, particularly when the wintertime ban is in effect.

Limits on Consecutive Parking Hours One and two hour restrictions are mainly employed around university areas and industrial sites adjacent to residential neighborhoods. Transit stations do not create major parking problems and in only a few instances have restrictions been implemented nearby. Although restrictions apply to both residents and visitors, the city feels they are widely accepted and generally successful. Enforcement is selective and generally occurs only when residents complain.

Alternate Side Requirements During Daytime An alternate side parking requirement is in effect from 9:00am to 7:00pm, Monday through Friday. Although the intent is to facilitate snow-plowing and street-cleaning, the effect is to discourage all day parking as most employees must be at their place of work by 9:00am (and are thereby prevented from moving their car at 9:00 a.m.).

Non-resident Prohibition A residential parking permit program proposed by a previous traffic commission was rejected by the city legislature.

CAMBRIDGE, MA

Curbside Ban The historical development of Cambridge has produced some streets which are much too narrow for both parking and traffic. These streets have complete parking bans at all times.

Limits on Consecutive Parking Hours Meters with one and two hour limits have been installed near commercial areas.

Alternate Side Requirements During Daytime None

Non-resident Prohibition A residential parking permit program was initiated in 1972 and has since spread to 90 percent of the residential streets. The Massachusetts Supreme Court subsequently ruled that the ordinance must be city-wide to be constitutional. Residents with an auto registered in Cambridge may purchase a parking permit and visitor passes (the permit must be renewed annually). A large university and rapid transit terminus are major commuter attractions.

CHAPLOTTEVILLE, VIRGINIA

Curbside Ban On narrow streets with parking problems, the city may ban all parking at residents' request.

Limits on Consecutive Parking Hours None

Alternate Side Requirements During Daytime None

Non-resident Prohibition A residential parking permit program has been implemented in 4 areas of the city. Three sites are near the university and one site is near downtown. Residents may purchase permits for \$10/yr; autos without decals are prohibited from parking in these areas between 6:00 a.m. and 5:00 p.m.

CHICAGO, ILLINOIS

Curbside Ban None

Limits on Consecutive Parking Hours One and two hour restrictions are employed around certain business areas and rapid transit stations. No municipal policies are under consideration to reconcile commuter parking demand and supply around rapid transit stops. However, parking is provided at commuter rail lines which are more distant from the CBD.

Alternate Side Requirements During Daytime None

Non-resident Prohibition A residential parking permit program was proposed by the Mayor shortly after the Arlington, VA decision. A residential community adjacent to a large university had previously requested non-resident parking prohibitions; in part, because the nearby student parking lot was not being fully utilized. The proposed area is within a 2-3 block radius of the university and will cover 24 curb blocks. Two types of permits will be sold: (1) year-round, and (2) one-day (to be validated by residents on the day of use). The program will be implemented around May 1, 1978 on an experimental basis. After evaluation, consideration will likely be given to applying similar controls near restaurants, banquet halls, theatres, stadiums, recreational facilities, etc. on a city-wide basis.

CINCINNATI, OHIO

Curbside Ban Parking will be prohibited from one side of a street, if it is less than 18 feet wide. The purpose is to provide reasonable access for emergency vehicles.

Limits on Consecutive Parking Hours The city initially employed two and a half hour parking restrictions to deter long-term parkers. However, administrators felt that this only shifted the problem from one area to adjacent neighborhoods and the police found it troublesome to enforce. Meters (ranging from 30 minutes to 2 hours) have largely replaced the above restrictions in residential areas. Residents expressed mixed emotions on the deployment of meters; but, generally accept them in deteriorated parking conditions. Industrial areas, universities and transit stops were all cited as potential problem areas. Meters are also installed near business districts where patrons encroach on residential parking.

Alternate Side Requirements During Daytime None

Non-resident Prohibition Concept currently being discussed.

CLEVELAND, OHIO

Curbside Ban All residential streets designated one-way have parking bans on one side. Exceptions are older neighborhoods with inadequate off-street facilities; parking may be permitted on both sides of the one-way. Narrow courts or alleys may have bans on both sides.

Limits on Consecutive Parking Hours Two hour parking limits between 7:00 a.m. and 6:00 p.m. are employed near factories, employment centers, and schools. Residents must petition for restrictions and a traffic study is conducted to determine if they're warranted.

Alternate Side Requirements During Daytime Special wintertime regulations are used to facilitate snow removal.

Non-resident Prohibitions None



DENVER, COLORADO

Curbside Ban Through streets in residential areas may have parking bans to promote traffic flow.

Limits on Consecutive Parking Hours Limits of one-half, one and two hours between 8:00 a.m. and 5:00 p.m. may be implemented at citizens' requests. Restrictions are aimed at all day parkers near transit stops and commercial areas. The city will ascertain if adequate off-street parking is available before implementing time limits.

Alternate Side Requirements During Daytime None

Non-resident Prohibition None

HARRISBURG, PA

Curbside Ban None

Limits On Consecutive Parking Hours None

Alternate Side Requirements During Daytime None

Non-resident Prohibition A residential parking permit program has been formulated and is scheduled to be implemented in the late spring. Neighborhoods around the state capital, a major hospital, and certain business areas were subject to severe parking congestion and requested relief. The program will prohibit non-resident parking between 8:00 a.m. and 6:00 p.m. Visitor passes will be provided.

LOS ANGELES, CA

Curbside Bans None

Limits on Consecutive Parking Hours Limits will be enacted if resident request them and the Traffic Department warrants their propriety. The practice is fairly widespread throughout the city and factories and universities are typical reasons for resident requests.

Alternate Side Requirements During Daytime None

Non-Resident Prohibition None

MADISON, WISCONSIN

Curbside Ban Restrictions are used on very narrow streets and generally are in effect from 8:00 a.m. to 6:00 p.m.. Some arterials running through residential areas may also have parking bans.

Limits on Consecutive Parking Hours The city employs two hour parking limits in many residential areas. Areas near commercial districts are typical sites.

Alternate Side Requirements During Daytime None

Non-resident Prohibition A residential parking permit system is in effect near colleges, high schools, and business districts. Certain criteria must be met before an area will be considered for inclusion in the permit program (e.g., proximity to transit stop to provide alternative mode, number of non-resident parkers, etc.). The city is consciously coordinating parking and transit and all streets selected for the RPPP to date are within 1200 feet of a bus stop.

MIAMI, FLORIDA

Curbside Bans None

Limits on Consecutive Parking Hours A large shopping center was creating excessive parking demand in a nearby residential area. Residents requested, and the city installed, parking meters to discourage parking. The policy has been successful and has diverted parkers back to the shopping center parking lot.

Alternate Side Requirements During Daytime None

Non-resident Prohibition None

MIDTOWN MANHATTAN-NEW YORK CITY, NEW YORK

Curbside Ban There are total parking bans in mixed use areas (both commercial and residential) from 7:00 a.m. to 7:00 p.m., Monday through Friday. Some residential areas also restrict parking during morning and evening traffic peaks.

Limits on Consecutive Parking Hours Hourly limits and parking meters are widely used. Virtually all areas have alternate side requirements which effectively limit the number of parking hours.

Alternate Side Requirements During Daytime Alternate side parking is permitted from 8:00 a.m. to 11:00 a.m. on one side and then 11:00 a.m. to 2:00 p.m. on the other side. This mid-morning change prohibits all-day parking.

Non-resident Prohibition None

MILWAUKEE, WISCONSIN

Curbside Ban Curbside bans are occasionally employed on narrow streets and during peak hours on major thoroughfares.

Limits on Consecutive Parking Hours One and two hour restrictions are widely employed throughout the city. Due to the localized nature of many parking problems, strategies have evolved which may incorporate several policies. For example, parking may be banned on one side and one hour restrictions placed on the other side. Areas near the university have serious parking problems and the city and school have cooperated to rectify them with fringe parking lots and shuttle buses.

Alternate Side Requirements During Daytime None

Non-resident Prohibition Neighborhoods near factories, schools, hospitals, etc. are eligible for inclusion in the residential parking permit program. Many of these areas were initially subject to two hour restrictions, but residents felt they were being unjustifiably penalized. If residents request the program and the city warrants its propriety after applying program criteria, residents will be exempted from the 2 hour restrictions if they purchase and display a permit (costing \$6/yr).

MINNEAPOLIS, MINNESOTA

Curbside Ban Bans have been instituted in areas with severe parking problems (near a university). Residents requested the control.

Limits on Consecutive Parking Hours There is a city-wide ordinance restricting parking to two hours. Signing and enforcement are selective and occur mainly around the university. Near certain business areas, bus lines, restaurants, etc., parking is limited to one hour.

Alternate Side Requirements During Daytime None

Non-resident Prohibition The city has designated two "critical" parking areas with one and 2 hour parking restrictions for non-residents (during the hours of 8:00 a.m. to 6:00 p.m.). Residents are eligible for identification stickers which exempt them from the regulation. Preliminary observations suggest that some auto commuters have switched to transit or carpools. (This conclusion is based on the observation that the gain in off-street parking is less than the reduction in on-street parking.)

NONTGOMEY COUNTY, MARYLAND

Curbside Ban Parking may be banned from one or both sides of the street if it is determined that emergency vehicles or other traffic is significantly hampered by excessive parking. Citizens request that such an evaluation be made.

Limits on Consecutive Parking Hours Residential areas bordering central business districts may have 1 hour, 2 hour, or all day (9:00 a.m.-5:00 p.m.) parking restrictions.

Alternate Site Requirements During Daytime None

Non-resident Prohibition A residential parking permit program has been instituted in a 25 square block area in Bethesda, Md. Neighborhood organizations petitioned the County Council to ameliorate parking congestion caused by retailers, employment centers, and a major bus terminal for Washington-bound commuters. The program is considered successful and an additional site near a college in Silver Springs is under review.

NEW BRUNSWICK, NJ

Curbside Ban None

Limits on Consecutive Parking Hours Hourly limits are used in some neighborhoods; however, enforcement is selective.

Alternate Side Requirements During Daytime None

Non-resident Prohibition New Brunswick has severe problems with New York City-bound workers who use the commuter rail lines. An ordinance is currently being drafted to prohibit non-residents from parking in residential areas near the train stations. Neighborhoods near the University may also be included in the ordinance (to alleviate parking shortages caused by students).

NEW ORLEANS, LOUISIANA

Curbside Ban None

Limits on Consecutive Parking Hours The city has an ordinance which prohibits out-of-parish (county) parkers from parking on city streets for more than four consecutive hours. Suburban commuters generate significant parking demand in residential areas near a major downtown transit route. The city is currently seeking ways to intercept commuter traffic. Alternatives under consideration include: (1) stricter enforcement of existing ordinance, and (2) resident sticker program to make auto identification easier. (Autos are presently identified by parish-issued safety inspection stickers.)

Alternate Side Requirements During Daytime None

Non-resident Prohibition See limits on consecutive parking hours above.

OAKLAND, CALIFORNIA

Curbside Bans None

Limits on Consecutive Parking Hours The traffic department responds to residents' requests for hourly parking limits. Limits will be instituted if the department deems they are appropriate.

Alternate Side Requirements During Daytime None

Non-resident Prohibition None

PHILADELPHIA, PENNSYLVANIA

Curbside Ban Curbside parking is prohibited during peak hours on many arterial streets traversing residential areas.

Limits on Consecutive Parking Hours One and two hours limits are employed around transit stations, employment centers and universities. (Metered parking is also used.) Restrictions are implemented in response to community requests and enforcement generally occurs when citizens complain.

Alternate Side Requirements During Daytime There is a four hour restriction one day a week to permit street-cleaning.

Non-resident Prohibition None

PITTSBURGH, PA

Curbside Ban At residents' requests, curbside bans may be instituted to enhance traffic flow or promote safety on narrow streets.

Limits on Consecutive Parking Hours Hourly limits are rarely used in residential neighborhoods. In the few instances where they are used, residents have requested the limits to relieve parking pressures generated by nearby factories, hospitals, etc.

Alternate Side Requirements During Daytime Parking may be prohibited on arterial collector streets during the peak hours on alternate sides. The purpose is to promote traffic flow by prohibiting parking on the inbound side during the morning and on the outbound side during the evening.

Non-resident Prohibition This policy is under consideration.

PORTLAND, OREGON

Curbside Ban One of several policies which may be employed to alleviate parking problems. Residents will request a parking investigation and if the city determines there is a problem, a neighborhood meeting will be arranged. The meeting is followed by a city-sponsored post card mailing to allow residents to privately vote for their choice of parking policy for the area.

Limits on Consecutive Parking Hours Hourly limits may be implemented at the request of residents. Hospitals, theatres, taverns, playgrounds, schools, and transit stations all account for resident requests for parking restrictions. A free transit zone downtown has encouraged parking in residential areas adjacent to the CBD.

Alternate Side Requirements During Daytime None

Non-resident Prohibition Residential parking permit program under consideration.

PRINCE GEORGE'S COUNTY, MARYLAND

Curbside Ban Parking has been wholly prohibited in some residential areas in the county. The policy has been adopted in response to citizens' requests to alleviate commuter parking congestion. The practice is not widespread.

Limits on Consecutive Parking Hours Two hour limits are widely used around transportation corridors to discourage all day commuters. Combinations of parking bans on one side of the street and hourly limits on the other side are also used.

Alternate Side Requirements During Daytime None

Non-resident Prohibition Takoma Park, Md. has instituted a residential parking permit program in response to parking congestion caused by a college and a Metro stop. There is limited parking at the transit stop and the neighboring residential areas requested relief. The neighborhoods also oppose parking lots because of the additional traffic attracted. The kiss and ride alternative has been proposed but is not likely to resolve the commuter parking/resident resentment problem.

PROVIDENCE, RHODE ISLAND

Curbside Ban: Parking bans have been instituted in select neighborhoods to reduce auto congestion and promote emergency vehicle access. Neighborhood parking conditions were aggravated by a college and shopping center. In the area near the college, the solution was to implement curbside bans from 8:00 a.m. to 4:00 p.m. on school days. The traffic department responds to citizen's requests and performs parking studies to determine actual conditions. The current ban is considered successful and diverts parkers to areas designed for greater volume.

Limits on Consecutive Parking Hours: Limits on consecutive parking hours are used in residential areas where the parking problems are not severe enough to warrant curbside bans.

Alternate Side Requirements During Daytime: None

Non-resident Prohibition: None

QUEENS-NEW YORK CITY, NEW YORK

Curbside Ban: Streets with narrow widths or commuter thoroughfares may have all day curbside parking prohibitions.

Limits on Consecutive Parking Hours: Two hour restrictions are widely used in neighborhoods abutting commercial areas.

Alternate Side Requirements During Daytime: None

Non-resident Prohibition: None

RICHMOND, VIRGINIA

Curbside Ban: Curbside Bans are only used on narrow streets. There are no concious municipal policies to exclude autos from certain areas.

Limits on Consecutive Parking Hours: A one hour parking restriction is widely used in residential areas throughout the city. (SEE RPPP BELOW).

Alternate Side Requirements During Daytime: None

Non-resident Prohibition: A residential parking permit program was instituted in 1973 in a densely populated area of about #1 block faces. Student commuters to a nearby university were creating unmanageable parking demand. Parking in the area is restricted to one hour; however, residents displaying a permit are exempt. The City feels that enforcement has been the key to the program's success.

ROCHESTER, NEW YORK

Curbside Ban: None

Limits on Consecutive Parking Hours: City-wide ordinance permits 6 hours of consecutive parking; however, it is only rarely and selectively enforced. Three hour limits are used to prevent all day parking near industrial and commercial sites.

Alternate Side Requirements During Daytime: None

Non-resident Prohibition: None

ST. LOUIS, MISSOURI

Curbside Ban None  
 Limits on Consecutive Parking Hours None  
 Alternate Side Requirements During Daytime None  
 Non-resident Prohibition None

SALEM, OREGON

Curbside Ban None  
 Limits on Consecutive Parking Hours One and two hour parking limits between the hours of 8:00 a.m. and 5:00 p.m. are in effect in several residential sections. Employment centers, state offices, and retail stores create excess parking demand in nearby residential areas.  
 Alternate Side Requirements During Daytime None  
 Non-resident Prohibition The city issues all-day parking permits to residents in areas with one and two hour restrictions (the permits are free). Salem is pursuing a transportation policy which promotes alternatives to the auto. The residential parking permit program was initiated by the city and started on February 1, 1978 after environmental data, car counts, and license checks were collected and analyzed. The evaluation process includes an investigation of parking alternatives and there is a conscious policy to recognize the parking needs of transit commuters.

SAN ANTONIO, TEXAS

Curbside Bans None  
 Limits on Consecutive Parking Hours None  
 Alternate Side Requirements During Daytime None  
 Non-resident Prohibition None

SAN FRANCISCO, CA

Curbside Ban Parking bans are employed on one side of some narrow streets to permit emergency vehicle access. Bans on both sides of the street are only considered if the street is extremely narrow.  
 Limits on Consecutive Parking Hours One and two hour limits may be instituted at the request of neighborhood residents. Traffic generators (e.g., transit stops, commercial districts, etc.) typically have prompted resident requests.  
 Alternate Side Requirements During Daytime None  
 Non-resident Prohibition A pilot residential parking permit program was instituted near the BART station in Daley City in 1977. The program covers about seven block faces and the parking permits allow residents to park all-day in areas posted with two-hour limit (between 8:00 a.m. and 6:00 p.m.). Although a large parking garage exists near the transit stop, commuters had previously found it cheaper and/or easier to park in nearby neighborhoods. The program has successfully reduced traffic and parking congestion. A residential parking permit program was implemented in the North Beach residential area in 1978. San Francisco intends to implement from 15 to 20 new zones during the next 6 to 18 months.

SEATTLE, WASHINGTON

Curbside Ban  
 Limits on Consecutive Parking Hours  
 Alternate Side Requirements During Daytime  
 Non-resident Prohibition

None  
 Meters restrict parking to short term use in some areas. Residents requested installation to offset demand created by large parking attractions (employment centers, businesses, etc).  
 None  
 A residential parking permit program is under consideration. The potential areas for application are near a business district; however, before implementing an RPP the city wishes to increase parking opportunities elsewhere to accommodate displaced parkers.

TUCSON, ARIZONA

Curbside Ban  
 Limits on Consecutive Parking Hours  
 Alternate Side Requirements During Daytime  
 Non-resident Prohibition

Curbside parking is prohibited in some residential areas which border commercial districts. Prior to implementing a ban, the traffic department determines if there is adequate off-street parking for residents.  
 Hourly limits are used to prevent all-day parkers and to encourage short-term use of parking capacity.

None  
 None

WASHINGTON, DC

Curbside Ban  
 Limits on Consecutive Parking Hours  
 Alternate Side Requirements During Daytime  
 Non-resident Prohibition

On narrow streets and alleys, parking may be prohibited on one or both sides.  
 Two hour limits between 7:00 a.m. and 6:30p.m. are widely used in neighborhoods strongly impacted by commuter parking. The city is trying to include these areas in its residential parking permit program. (See below)  
 None  
 The city has a residential parking permit program which allows residents unlimited parking in areas posted for 2 hours. The system is administered on a zonal basis (corresponding to city wards) and provides residents with parking passes for visitors. Residents must apply for a visitor pass on each occasion. The city believes that careful monitoring of the pass prevents wide-spread abuse. Both commercial areas and transportation corridors are included in the existing zones (e.g., Georgetown, Capital Hill, Friendship Heights).

WILMINGTON, DELAWARE

Curbside Ban  
 Limits on Consecutive Parking Hours  
 Alternate Side Requirements During Daytime  
 Non-resident Prohibition

Some major commuting routes traversing residential areas having parking restrictions during peak hours. Also, parking is prohibited from 8:00 a.m. to 9:30a.m. on one side of the street in select locations with strong long-term parking demand. This restriction is used in conjunction with the residential parking permit program in areas where enforcement is hampered by the large size of the area.

Two hour restrictions are in effect in certain residential areas.  
 None

The city has a residential parking permit parking program which exempts residents from the posted two hour parking restrictions. Isolated parking problems around medical centers and downtown employment centers lead to citizens requests for relief. The program initially lacked a permit renewal requirement which prevented effective control and lead to illegal activities. The city has subsequently instituted a 2 year renewal requirement.

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