

provided as is the case for the remainder of Pretoria, except in the case of shops where 1 space/116 m<sup>2</sup> GFA ( $\pm 0.9$  space/100 m<sup>2</sup>) must be provided.

In Johannesburg the central area is divided into four zones (A, B, C, and D). Except in certain special cases, no parking may be provided for any building in the core (i.e., zone A). In zones B and C it may only be provided for sites of 1480 m<sup>2</sup> or greater in extent and in zone D on sites of 900 m<sup>2</sup> or larger. If parking is provided in these zones, it may not exceed a certain number of spaces, as specified in the town planning scheme. These requirements are much less than those for the remainder of Johannesburg.

It is not possible to recommend minimum standards for the central areas of large cities as they depend on the local circumstances and also on the parking policy adopted by the local authority. The above summary of the requirements for the central areas of Pretoria and Johannesburg do, however, give some indication of what such requirements could be and the principle of precluding the provision of parking in highly pedestrianized areas is supported in these circumstances.

#### CONCLUSION

We hope that the minimum desirable standards for parking dimensions and parking provision requirements developed in the report and summarized in this paper will provide guidance in South Africa and also contribute to some uniformity in parking standards in other countries. These are standards to be applied with the necessary care and understanding; properly motivated deviations will be necessary from time to time. It will also be necessary to revise and update the report from time to time. Comments on the report will thus be welcome.

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## Implementation of a Regional Parking Policy: Institutional and Political Considerations

JOSUÉ TANAKA AND MICHAEL D. MEYER

Parking policy in most U.S. cities consists of the independent actions of a large number of transportation and parking agencies, each implementing different parking management strategies to achieve a wide variety of urban goals. How-

ever, the use of the provision of parking as a policy lever for attaining urban objectives in a comprehensive and consistent manner requires the formulation and implementation of a regional parking policy. This paper examines the in-

stitutional issues that affect the formulation of such a policy. Case studies of Alexandria, Virginia; Baltimore; Boston; Evanston, Illinois; Hartford, Connecticut; and Seattle are used to illustrate the complexity of the institutional structure for parking policy. These case studies showed that formulation and implementation of parking policy are influenced by the capability of the lead agencies to adopt and implement parking strategies, the diversity of objectives and constituencies that correspond to these lead agencies, the degree of consensus on the policy objectives, the level of communication among these agencies, and the state of the economy in the metropolitan area. A set of implementation guidelines is provided for formulating a regional parking policy. We conclude that a regional parking policy is essential if parking is to be used as a means of influencing urban objectives. Major effort has to be exerted in two areas to develop such a policy: (a) establishment of the institutional base to support a regional parking policy and (b) identification of a means of measuring the effect of parking management strategies (and combinations thereof) on urban objectives. We recommend that the latter task be the focus of future research in the area of parking policy.

The provision of adequate parking in urban areas has long been an important item on the agenda of public officials. Parking policy has been traditionally associated with public policy toward the automobile and its concomitant impacts. Before 1970, when the objective of most transportation policy was the accommodation of the automobile through highway construction, parking policy was simply focused on where sufficient space could be found to provide the needed storage for all of the automobiles that use these new highways. During the early 1970s, however, as the emphasis in transportation policy shifted away from a highway-oriented program, the role of parking in the transportation system, and perhaps its more important role in the larger economic and social urban environment, began to receive closer scrutiny (1). The purpose of this paper is to examine this expanded role for parking in the urban system and to identify the institutional characteristics of the existing structure of parking policy formulation and implementation (2).

#### INSTITUTIONAL STRUCTURE OF PARKING MANAGEMENT

Parking availability has traditionally been considered a necessary component of the trip-making sequence and thus a basic element of automobile accessibility and mobility. Until recently, however, the development of a coordinated approach to parking management has been either nonexistent or has focused solely on the objective of congestion relief. Such an approach has also not yet totally been accepted in principle by agencies traditionally associated with the provision, management, and regulation of parking supply. The findings of a recent research study have indicated that "this restrictive perception of parking management is only one aspect of such tactics and, in fact, is not consistent with the application of parking management tactics by many jurisdictions" (3). The institutional structure (i.e., the agencies and their interrelationships) for formulation and implementation of parking policy is very complex and often hinders the development of a coordinated parking management program. The various legal, financial, and operational aspects of the parking sector involve numerous organizations such as development agencies, police departments, building and zoning commissions, real property boards, or public works departments.

One of the major identifying characteristics of the parking sector at the local level is its separation into public and private providers of parking space. In spite of functional complementarity, the public and private components of parking supply tend to exist independently of each other. However, the private sector is mainly interested in profits, and the public sector agencies have a multitude of

different objectives that they are trying to achieve through the use of parking and other transportation strategies. The private sector is mainly active in commercial off-street parking facilities (e.g., open-lots or garages) and also provides a substantial number of parking spaces for business and private development not available for general use.

The public sector is different in that a larger set of agencies and organizations and a more expansive set of objectives is involved. Indeed, the service represented by parking falls within various functional lines of many public sector organizations, and each one has its own particular conception of the role of parking. Traffic departments are largely responsible for the on-street supply and, in some cases, the off-street supply as well. Their primary responsibility is with traffic flow and safety, and, consequently, parking is viewed in light of its effect on vehicular movement. Transit authorities and sometimes state and county transportation departments often provide park-and-ride lots. The main objective here is to provide an adequate supply of spaces in order to facilitate the use of the transit system.

Many cities also have a municipal agency responsible for the provision of off-street parking. In smaller cities, this agency is usually found within the traffic engineering department and is generally concerned with how off-street parking can alleviate a perceived deficiency of available on-street parking spaces. In most cases, off-street parking policies are based on the belief that an adequate aggregate supply of parking is a prerequisite for sound downtown economic development. Consequently, if the perceived level of on-street parking is inadequate, downtown business people will often advocate the provision of more off-street parking spaces.

This institutional fragmentation in the parking sector often leads to a site- or action-specific approach to planning. As particular needs or local problems arise, they are generally dealt with on a piecemeal basis without full consideration of the impacts of proposed solutions on other elements of the parking sector or on the transportation network. For example, when residents in urban areas complain about the parking situation in their neighborhood, the common approach has been to solve the particular problem at the scale of the residential area concerned. Often, the adopted solutions at this scale solve the residents' problems; however, they also create greater difficulties for larger numbers of people. A good example of this is when large numbers of drivers who usually park near rapid transit stations are no longer able to park and ride the transit line; thus, the transit system is hurt and substantial numbers of people are inconvenienced (4).

The resolution of a problem at the subregional level can result in considerable negative impacts at the regional level. For this reason in particular, the consideration of a parking policy, defined here as a set of parking strategies to achieve broader urban objectives, can provide a basis for solving parking problems at both levels.

The institutional fragmentation at the local level is generally matched by a parallel fragmentation of federal mechanisms for intervening in or influencing parking-related decisions. The Federal Highway Administration (FHWA) can fund two types of parking facilities under the federal-aid highway program: (a) fringe and transportation corridor parking and (b) replacement parking. In the first case, only public-transportation-related parking projects outside of the central business district (CBD) can be funded (5). In the second case,

federal-aid funds can be used to construct off-street replacement parking facilities when the implementation of a federal-aid project requires the removal of on-street parking in an area that has a critical shortage of parking spaces (6).

The Urban Mass Transportation Administration (UMTA) capital grant program funds parking projects if they can be related to transit services. Although under present guidelines for the urban initiatives program parking facilities can be funded if they are found essential to the project and enhance proposed mass transit services, UMTA is currently considering stricter guidelines that would severely limit the type of parking project funded with UMTA funds. In fact, some UMTA regional offices seem to be already following a policy of not funding parking projects.

The Federal Railroad Administration (FRA), as part of its Northeast Corridor Improvement Program (NECIP), will spend about \$35 million for parking in the renovation of several railroad stations. The FRA estimates that, in all, 8000 spaces will be provided through its program.

In some cases, federal funding for parking projects can be at cross-purposes with the objectives of other federal programs. For example, while the U.S. Environmental Protection Agency (EPA) and UMTA, through various programs, focus on decreasing the use of automobiles in downtown areas and fostering the competitiveness of alternative modes of access, funds from the U.S. Department of Housing and Urban Development (HUD) continue to provide incentives for urban areas to plan (largely in isolation from other transportation decision making) large downtown parking developments.

In summary, the parking sector is characterized by a high degree of complexity and fragmentation, both in terms of the variety of organizations responsible for managing each of its components as well as in terms of the variety of objectives that motivate the involvement of these organizations in the parking sector. Perceived local parking problems tend to be dealt with as they arise (i.e., a specific action is chosen and tailored to address a particular problem). Thus, parking supply in the aggregate is managed by a large variety of individual actions that attempt to deal with a set of specific problems. This isolated use of parking actions is also associated with a general lack of concern for secondary impacts of local problem solutions, particularly in locations adjacent to the geographic area of immediate concern. As has been found in the implementation of neighborhood parking strategies, the problem has often just been transferred to adjacent areas (see paper by Meyer and McShane in this Record).

The use of a specific strategy to deal with a particular problem might address only one aspect of the global parking allocation problem. Indeed, parking problems cited by different localities might be considered as variations on the more basic problem of allocating a restricted supply of parking to a variety of competing uses, such as residential parking, retail and business-related parking, entertainment and other off-peak parking uses, and communication. The definition of a strategy related to a specific local problem might, therefore, result in increasing the tensions in the allocative process among the other competing uses.

One solution to the problems identified above is the articulation of a regional parking policy that consists of parking management packages. Not only is the notion of parking policy a prerequisite to the creation of a structure able to reduce the impacts of negative spillover effects, but it is also a prerequisite for addressing problems at the

scale of the urban area. Because a comprehensive parking policy constitutes an action at the level of the urban area, it is a particularly appropriate way of addressing urban objectives. A coordinated parking policy approach thus constitutes a prerequisite to the serious linking of parking policy and urban objectives.

The failure to reconcile the fragmented nature of the parking sector with the necessity for formulating and implementing a comprehensive parking management program leads to a tenuous link between action in the parking sector and the ability to deal with larger urban issues through parking. From this point of view, issues that surround policy implementation and the analysis of such issues become a prerequisite to the formulation of parking policy. The following analysis is therefore not aimed at the implementation of specific parking management strategies but at the more basic analysis of the possible configurations in which parking policy might be conceived within the existing institutional environment of the parking sector.

#### ANALYSIS OF PARKING POLICY FORMULATION AND IMPLEMENTATION

The objective of the methodology used in this research was to provide an analytical framework for understanding the institutional functioning of the parking sector. Such an understanding was necessary in order to define institutional preconditions that lead to the formulation and implementation of parking policy. The tool of analysis used in the following methodology is institutional analysis. It is defined as the analysis of a group of organizations that interact in the pursuit of a particular task, and the resulting problems that arise from the nature of these interrelations at any stage of the policy process, by using elements of organization and political theory. As such, institutional analysis is normative since it is aimed at improving the policymaking process and policy content. It is also decision-oriented in the sense that it is used to produce an input to the decision-making process. And it is anticipatory in that it structures in a logical taxonomy the uncertainty that surrounds the pursuit of a particular task.

A telephone survey of transportation, parking, and local elected officials in selected case-study cities was the primary method of data collection. The selection of the case-study cities was based on three sources of information that provided data on the characteristics of different cities in relation to their parking management activities: (a) the Virginia Highway and Transportation Research Council survey of 1977 (7), (b) the 1979 Public Technology, Inc. survey, and (c) the 1979 Peat, Marwick, and Mitchell study (3,8).

Three criteria were used in selecting the case-study cities for this research:

1. Together, the cities should have implemented a wide variety of parking management actions;
2. Individually, they should have implemented a variety of strategies; and
3. There should be a common set of implemented strategies among the cities.

By using these criteria, the following set of cities was chosen for study: a set of large cities, which consists of Baltimore, Boston, and Seattle, and a set of medium cities, which consists of Alexandria, Virginia; Evanston, Illinois; and Hartford, Connecticut.

#### Baltimore

Three major organizations are concerned with parking



in Baltimore. The Baltimore Department of Transit and Traffic plays a central role in the planning and implementation of several parking management strategies within the city limits. A carpool preferential parking program, which is part of the general policy to improve air quality in the Baltimore region by reducing the use of the automobile, and a residential parking program, which is aimed at solving the local parking problems of residential neighborhoods adjacent to large traffic generators, are examples of two such strategies. These two strategies, however, present some contrasting institutional characteristics.

The carpool preferential parking program is developed within the administrative structure of the department. In contrast, the residential parking-permit program requires, over an area of 10 blocks, signatures from 60 percent of the households (one signature per household) in order to support an application. Additional field work is then necessary before implementation. The acceptance by key actors of the residential parking program has also been controversial. Many of the businesses and other establishments that attract nonresident automobiles have opposed such a program, thus the environment of program implementation is somewhat turbulent.

Another major agency involved in the parking sector of Baltimore is the Off-Street Parking Commission, whose main role has been to provide funds for the building of off-street parking facilities. The main objective of the commission is to support the development of the city with an adequate supply of off-street parking, an objective that is substantially different from that of the Baltimore Department of Traffic and Transit.

The Baltimore Department of Traffic and Transit is more concerned about using parking management strategies to improve air quality and decrease the use of the automobile by commuters; however, the Off-Street Parking Commission has operated on the precept that the development of Baltimore depends on its accessibility to automobiles, particularly in terms of parking. Even though there is interaction between the Off-Street Parking Commission and other city agencies, it does not seem to affect the dual focus in Baltimore's approach to parking.

The third major actor in Baltimore's parking program is the Greater Baltimore Committee, which is associated with the Baltimore Chamber of Commerce. The committee has established a task force that will examine the existing parking situation in Baltimore and recommend both short- and long-term solutions. An underlying attitude among committee members is that there is a strong need for a more coordinated approach to the parking sector.

The parking sector in Baltimore thus operates on the basis of a parking policy that is not clearly enunciated and reflects the dual concern of the city to improve air quality and maximize the redevelopment of the downtown area. Consequently, in spite of executive intervention in such strategies as the preferential carpool program, there is a conspicuous lack of cohesiveness in the orientation of parking policy in Baltimore. The initiative of the Greater Baltimore Committee could possibly provide the catalyst for development of such an orientation.

### Seattle

Seattle's parking program originated with the EPA state implementation plan (SIP) regulations aimed at improving air quality in the nonattainment area of the Seattle air quality control region. Even after the subsequent relaxation of EPA's enforcement, the concern and interest of the city to manage its

parking supply in a consistent manner has remained. Other transportation-related objectives, such as the reduction of peak-hour traffic or the increased use of transit, have also emerged as strong objectives underlying the parking program. The mayor's office, the Seattle Office of Planning and Evaluation, the City Council, and the Seattle Department of Community Development continue to maintain a positive attitude toward a structured and consistent parking management policy.

A clear commitment for coordination exists in Seattle. Coordination is currently practiced in two ways: the definition of responsibilities within the parking sector and the creation of a task force on parking. In terms of role definition, Seattle presents a clear operational structure based primarily on the guidance provided by the Office of Policy and Evaluation, the City Planning Commission, and the Department of Community Development. This guidance is predominantly oriented toward environmental objectives, and no other parking policy guidelines are followed by other agencies within the city administration. This consensus allows for the development of adequate supporting strategies for parking management and the derivation of maximum benefit out of the success of complementary activities such as transit and carpool. It then becomes possible to develop around the policy core accessory parking management strategies aimed at more localized problems, such as a residential parking permit program or a growth-constraint program.

This consensus on environmental objectives is, in addition, reinforced by actions aimed at maintaining a working relationship among parties who could easily be antagonistic. A good illustration of such a relationship is a collaborative effort between the city's Office of Downtown Development and the Downtown Seattle Development Association in regard to a proposed downtown transit mall and the provision of additional parking. Although such collaborations are not a panacea, they provide valuable channels of communication and constitute useful conflict-avoidance mechanisms.

The definition of responsibilities also involves the Building Department, which overlooks the application of the zoning ordinance, mainly from the point of view of a strict environmental interpretation of the code. This role within a single organization allows for increased procedural efficiency and clearer decision making. It also provides for a better environment of policy guidance at the Office of Policy and Evaluation on particular development issues related to zoning in that it does not need to deal with a complex set of different agencies.

A task force on parking, which constitutes a second mechanism of coordination, has been involved in two main areas of work. The first area concerns the development of means to alleviate the parking problems associated with the zoning ordinance. For example, a ban on demolition of any building for transformation into an open lot and, even stronger, a ban on new open parking lot facilities have contributed to a decreased supply of available commercial off-street parking. Among transportation strategies considered by the task force to provide alternatives to downtown parking have been vanpools or subsidies to transit users.

Another function of the task force has been to examine the short-term parking supply in the retail core of the CBD. As the amount of spaces open to the general public has decreased and the private supply has increased substantially due to significant downtown development, the task force is searching for new regulatory tools able to provide an

adequate supply of short-term parking within the retail zone.

Recent judicial decisions have put new regulatory and intervention powers at the disposal of the city agencies for use in the parking sector. For many years, private operators succeeded in lobbying the state so that the city had a limited ability to build or acquire municipal lots and no taxation power at all, because the city had to keep the parking tax aligned with that of other operators. Recent state legislation has given the cities the option to use their new development or taxation powers in the parking sector. Thus, the regulatory environment of commercial parking in the core area is substantially transformed and the public has increased control over the supply of parking. However, the city is still unsure about how to use these new powers because of the pressure exerted by private operators and because it is still unsure about the technical consequences of such measures.

### Boston

The policy orientation of Boston relative to parking has not changed substantially since 1972. The city continues to encourage the use of mass transit to downtown and to discourage the use of the automobile. In spite of some equipment problems, the transit network is efficient, extensive, and provides the support for such a policy. In addition, the recent economic upsurge of downtown Boston has also indirectly protected the development of such a policy because clear indication of the negative economic implications of the freeze on parking spaces can be made. The transportation and economic environments provide, therefore, a favorable setting for the development of a parking policy aimed at discouraging automobile commuter traffic and one that reflects a commitment to air quality improvement objectives.

The fringe parking and park-and-ride programs operated by the Massachusetts Department of Public Works and the Massachusetts Bay Transportation Authority (MBTA), along with the freeze on commercial parking supply, are consistent with the objective of decreasing automobile use in the downtown area. Similarly, residential parking-permit programs and increased enforcement are aimed at protecting neighborhoods and congested areas of the city from high levels of inconvenience generated mostly by commuter parking.

Even with a general consensus on these guidelines for parking policy (the only significant opposition to these guidelines, and the freeze in particular, was voiced by the Chamber of Commerce), some problems at the administrative level arise due to the relative independence of the agencies involved. In the case of the freeze implementation, for example, a lack of coordination between the Boston Air Pollution Control Commission and the Building Department produced procedural delays that could be avoided by the definition of a clearly expressed process that involves all concerned agencies. Similarly, in the case of parking spaces leased to private operators by the Real Property Department or of private commercial parking operations, consistency in implementation is impossible. First, leases tend to be very long term, so that renegotiation of leases does not occur frequently and the inclusion of special pricing clauses is rare. In addition, in the case of private ownership and operation, it is very difficult to obtain unanimous cooperation of the operators on particular adjustments to the rate structure.

In the absence of a clearly defined parking policy, informal channels of communication operate

within the Boston administrative structure. In particular, informal communication operates among the Boston Redevelopment Authority, the Traffic and Parking Department, and the Boston Air Pollution Control Commission. In addition, the Traffic and Parking Department has shown, particularly in its residential parking-permit programs, a particular concern for interaction with community organizations at all levels of the policy process.

Boston presents, therefore, the case of a city that has a latent, unified set of purposes in relation to parking policy and a fragmented administrative structure with partial channels of informal communication operating within it.

### Medium-Sized Cities

The institutional structure for parking programs in medium-sized cities is generally fragmented and emphasizes a specific objective in agency actions. Indeed, all cities tend to be characterized by a major policy emphasis on growth. This emphasis varies in intensity among cities, depending on the particular economic environment. For example, Hartford's emphasis on development is strong due to the strong impact it has suffered from suburbanization, but Evanston is mainly concerned about growth at the site-specific level due to the relatively high level of development within the city.

Parking has become a major topic for debate in Alexandria, as evidenced by the following statement from the city of Alexandria Annual Report (9, p. 14):

The continuing revitalization of downtown Alexandria has increased demand for residential, shopper, and employee parking. Concurrently, new development has replaced some facilities.... A number of strategies have been applied or are under consideration to ease the situation. First, the city government is attempting to maintain the current supply of public parking. Second, all practical actions are being taken to place portions of the courthouse parking garage in operation before courthouse construction is completed. Third, City Council approved the residential parking permit system.... Fourth, the city government is supporting programs to reduce employee parking demand in the downtown area.... Finally, city staff is preparing a feasibility study for possible parking garages.

The major actors in the Alexandria parking program include the Traffic Engineering Department, which undertook much of the analysis and recommended implementation of specific strategies; the City Council, which actively debated and finally adopted a permit-parking program; and the Chamber of Commerce, which perceived the permit program as a hindrance to shopper convenience.

The Chamber of Commerce has also played an activist role in establishing parking policy in Evanston. For 10 years, the chamber has been sponsoring a merchant's parking coupon system that provides attractive parking rates to customers in the downtown area. Evanston has also been unwilling to allow open areas to be used for parking lots and, given the high level of transit accessibility, the City Council has changed the zoning law to reduce by 50 percent the minimum level of parking spaces needed in development projects. The City Council has also created a residential parking-permit program for a neighborhood adjacent to a major hospital. The Evanston parking policy is thus heavily oriented toward economic issues and in solving on a microscale basis problems that arise in specific neighborhoods or subareas.

A similar focus on urban economic development can be found in Hartford, where city officials and business groups have actively promoted downtown development through marketing, urban planning, and artistic design. In the process of defining the problems of the downtown area, these groups found that a major reason for shoppers not coming to the center city was transportation. Accessibility to shopping centers and availability of parking were perceived as clearly superior in suburban areas. To combat this, the downtown council, a government-business joint action group, has been active in promoting parking facilities in the downtown area, and the Hartford Development Commission also includes parking availability as part of its promotional strategy to attract development. In particular, it puts businesses directly in contact with private operators of parking facilities in areas where parking is scarce. The Zoning Commission enforces the effort to increase the parking supply by putting no ceiling on parking construction and by requiring relatively high minimum parking requirements for office buildings (one space per 500 ft<sup>2</sup>). In addition, substantial areas of redevelopment lots are presently devoted to surface parking.

To compete economically with the suburbs, the downtown council has developed, in conjunction with Connecticut Transit, Inc., and the Connecticut Department of Transportation, an instant-repay program aimed at making the downtown retail shops subsidize use of transit or parking in downtown for the customer. Special coins, sold by a major bank to merchants at \$26/100 coins, can be used either on buses or in parking lots by a customer who receives them from the merchant or professional office visited. A coin is given to the customer on presentation of an instant-repay coupon, which is distributed in buses or parking lots. The number of coins given is left to the discretion of each business, although a standard practice has been to give one coin for a \$5.00 purchase, two coins for a \$10.00 purchase, or a maximum of four coins per transaction (8).

Due to a high level of suburbanization, Hartford's daytime population is three times larger than that at night. Following the decision by Governor Thomas Meskill to minimize the effects of the anticipated gasoline shortage, a three-point program to reduce fuel consumption, traffic congestion, and air pollution was initiated by the Connecticut Department of Transportation. This program consisted of fostering carpooling and buspooling in private industry through computer ridematching, construction of additional interchange parking facilities for carpools, and development of additional express commuter bus service between suburban areas and the CBDs of Connecticut cities (12). The program has, therefore, a strong fringe parking component aimed both at increasing the use of carpools and transit to downtown Hartford. The program has developed in an impressive way; 121 commuter lots, which offer a capacity of more than 9000 spaces, were provided statewide by the end of 1978, but only 434 spaces in four lots were offered in 1970.

In summary, the types of parking management strategies implemented in medium-sized cities analyzed in this research reveal an ability to deal with particular, well-defined problems. The instant-repay program in Hartford or the merchant's coupon program in Evanston are aimed at one particular segment of the parking problem. Similarly, the residential parking problems of Alexandria and Evanston are site-specific actions in response to particular parking problems that arise from growth and congestion. From an institutional perspective,

the small-scale nature of the parking actions taken in these cities implies a smaller level of interaction needed among agencies. Also, the business community seems to play a dominant role in the direction of parking policy for these cities.

Analysis of these case studies indicates that five institutional variables seem to influence the process of parking policy formulation and implementation. These are as follows:

1. The capability of the lead parking agencies in the adoption, planning, and implementation of parking management strategies;
2. The diversity of objectives and constituencies that correspond to these lead agencies;
3. The degree of consensus among the agencies on the objectives of the parking management program;
4. The level of communication between these agencies; and
5. The state of the economic environment of the metropolitan area.

The identity of the different agencies involved in the adoption, planning, and implementation of parking management strategies used within a city provides a first indication of the level of concentration of effort in the parking sector. The range of effort includes a single agency to plan and implement all parking strategies to a variety of different agencies that are involved at each stage in the development of each parking management strategy. Initial inquiry about the nature of these agencies, therefore, constitutes a necessary preliminary step to assess the level of diversity that exists among the set of agencies involved in parking management.

Throughout the case studies, both the economic environment and the urban transportation context had a substantial impact on the nature of the set of parking management strategies implemented. The state of the economic environment affects the substantive goals of a city. In a city attempting to induce redevelopment in its downtown area, priorities are set relative to the necessity of attracting developers downtown. Alternatively, in a city enjoying a stable and consistent rate of growth, the management of growth, rather than seeking it, becomes the predominant notion. In the sense that parking tends to be perceived as an important component of downtown revitalization through its positive impact on accessibility, parking policy itself becomes affected by the nature of the economic environment. As the state of the economy improves and stabilizes at a consistent rate of growth, consideration of other objectives, such as environmental quality or residential amenities, becomes an essential guiding element in the determination of the set of objectives that supports the selection of parking management strategies.

The diversity of objectives and constituencies that correspond to this variety of parking strategies leads to the other important characteristics of the institutional structure for parking--the level of consensus and communication among the relevant agencies. The level of consensus on the objectives to be reached through the implementation of parking management strategies reflects the overall coordination and integration of parking policy within the metropolitan area. The degree of communication among the different agencies also affects the level of integration that can be reached within the existing institutional framework.

#### IMPLEMENTATION GUIDELINES FOR A REGIONAL PARKING POLICY

The analysis of the case studies described in the



previous section provides useful input into the formulation of a strategy for developing a comprehensive, regional parking policy and, most importantly, for identifying the roles of transportation agencies at all levels of government in encouraging such a policy. The following guidelines are offered for an individual or group of individuals who wish to set up the necessary institutional structure and to establish the foundation for a comprehensive policy.

#### Identify Relevant Participants and Their Capabilities for Active Participation in a Parking Policy Formulation Process

As was seen in the case studies, each metropolitan area has a different institutional structure for parking management. In some cases, city agencies are the most important actors; in others, the chamber of commerce or other business group plays a prominent role. The first step in developing a metropolitan parking policy is, therefore, the identification of organizations and individuals that play an important role in the provision of and policy guidance on public and private parking availability. An important task in this identification is also to determine the capability of each actor to actively participate in a policy formulation process. Some questions that need be asked here are, What staff capabilities do these groups have? What are the political and financial constraints under which these groups operate? What specifically can these groups contribute to a comprehensive parking policy? Over what component of the parking system do these groups have control?

#### Establish an Institutional Base for the Formulation of a Parking Policy

Once these groups have been identified, it is necessary to establish some means of continuous interaction and a forum for discussion on, and resolution of, conflicts that surround the directions of parking policy in a metropolitan area. A wide variety of actions could be taken, ranging from the creation of a new agency responsible for coordinating the operations of the parking sector to reliance on the entrepreneurial skills of agency staff to coordinate the process. In those cities where a sense of a regional parking policy has already been established, a task force or subcommittee has been the most used mechanism for providing the needed forum. The task of establishing this institutional base, however, is not necessarily an easy one in that agencies that have different objectives and capabilities are often hesitant to discuss issues aimed at creating a mutually satisfactory position on parking policy. This is especially true when both private and public interests are important actors in developing an integrated policy. However difficult it might be, the creation of such an institutional base is a prerequisite for efforts to develop a parking policy.

#### Develop Awareness of the Different Objectives for Which Parking Strategies Can Be Used

Because such a wide variety of agencies are involved with parking, there will generally be little consensus on one major objective that should guide the development of a parking policy. To try and reach a consensus on such an objective, given the different agency mandates and constituencies, would be most difficult. Instead, each participant in the process should be made aware that parking management strategies affect a large number of urban objectives and

that they can thus be used as a policy lever for achieving a diverse set of purposes, such as the following (1):

1. Healthy economic climate and a business community able to support local employment needs, which means the ability to attract and keep desired kinds of development and industry, a healthy retail sales climate, and a stable or growing municipal revenue base;
2. Most efficient use of existing transportation, land, and other public resources;
3. Ease of mobility and accessibility of resources for vehicles and pedestrians;
4. Equity of resource distribution and preferential allocation of some resources;
5. Environmental goals, especially reduced air pollution and the related goal of minimized energy consumption; and
6. Enhanced amenity and cultural attractiveness, or the preservation of a city's unique character.

As shown in Table 1, officials from different agencies in the case-study cities viewed the implemented strategies as helpful in attaining several objectives. As was also found in the case studies, however, many agency officials considered parking strategies solely from the perspective of their own agency's mandate and did not necessarily understand the relationship between their actions and the actions of other parking-related agencies. It is thus essential that a general awareness of what parking management strategies can and cannot do be developed among the participants of the parking policy process so that an internally consistent and multiobjective policy will be produced.

#### Identify and Analyze the Types of Parking Management Strategies Available for the Parking Policy

The range of impacts of a parking policy can be evaluated through the scope of the parking management strategies of which it consists. Based on the case studies, three levels of application may be defined (see Table 2). The areawide level corresponds to the broadest range of impacts and reflects that many strategies affect not only a particular area of the city but also the urban area as a whole. Park-and-ride programs, for example, are typical strategies that are not bound to specific geographical subareas of the region. The next level corresponds to strategies that have an impact at the level of the neighborhood. Residential parking programs fall mostly within this category. Finally, some actions are typically implemented at the site-specific level. This means, for example, that a particular set of parking management actions is applied at a local site in order to reduce the level of demand for site parking.

Each of the parking management strategies should be related to the objectives of the parking policy and estimates should be made, where possible, of the impact the strategies have on the attainment of these objectives. In most cases, the conclusions regarding feasible combinations of parking strategies and urban goals will be based largely on the likely effects of different market forces imposed on different parking-supply-demand scenarios and on implications of past experiences. No obvious metric exists, or has been used, to judge the absolute or relative effects of various parking management techniques on the goals being examined. Although preliminary efforts have been made in this direction, the analysis of parking management strategies must necessarily be based on experience and judgment (12).

**Table 1. Perceived objectives of implemented parking management strategies in the case-study cities.**

Strategy	Perceived Objective				
	Improve Air Quality	Improve Residential Areas	Encourage Retail Activity	Encourage Downtown Development	Produce Congestion Relief
Parking freeze and zoning	X				X
Park-and-ride	X				X
Preferential carpool parking	X				X
Parking enforcement		X	X	X	X
Residential parking permit programs		X			
On-street parking restrictions			X		X
Local constraints and pricing					X
Preferential parking for retail shopping			X	X	

**Table 2. Perceived scope of parking management strategies in the case-study cities.**

Strategy	Scope		
	Areawide	Neighborhood	Site Specific
Parking freeze and zoning	X		
Park-and-ride	X		
Preferential carpool parking	X		
Parking enforcement		X	
Residential parking permit programs	X	X	
On-street parking restrictions	X	X	X
Local constraints and pricing			X
Preferential parking for retail shopping			X

#### Formulate a Strategy for Implementing the Parking Policy

In a recent book on policy implementation, Nakamura and Smallwood state (15), "The policy implementation process is characterized by a complex series of diverse linkages among policymakers, implementers, and evaluators, and a high degree of political judgment and leadership is required to tie this system into an integrated whole." The institutional structure for parking policy is clearly characterized by such diverse linkages and thus susceptible to obstructions and delays throughout the parking policy formulation and implementation process. As such, it is extremely important that a strategy for policy implementation, where organizational responsibilities are clearly spelled out, where the lead agency or agencies have introduced features into the policy (e.g., incentives, mandates, or sanctions) to deal with resistance, and where efforts have been made to establish a feasible coalition of parking policy proponents, be developed and used.

#### CONCLUSIONS

The case studies of parking policy illustrate the fragmented nature of the institutional structure of parking policy in American cities. A large number of organizations, both in the public and private sectors, have a major role to play in establishing a comprehensive and coordinated parking policy. Currently, most parking policy in American cities consists of the independent actions of several agencies, each of which has a different mandate and a different set of constituencies. Each uses a variety of parking management actions to achieve objectives that often conflict. As is argued in this paper, however, a coordinated parking policy constitutes a prerequisite to the serious linking of parking policy and urban objectives.

The development of such a parking policy requires a close examination of the institutional relations that exist in the parking sector and the formulation of a strategy for establishing an institutional base

for a regional parking policy. Given the large number of agencies often involved with parking, one could expect significant obstacles in developing a policy aimed at achieving one or two objectives. It is therefore recommended that a major purpose of the policy formulation process should be to make the participants aware of the impact parking management strategies have on a large number of urban objectives.

Finally, a major obstacle to the development of a comprehensive parking policy is the lack of data on the impact of various parking management techniques on urban goals and objectives. The identification of such impacts and the formulation of a consistent set of effectiveness measures are research items that should receive top priority.

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## Role of Law Enforcement in Transportation Planning

JAMES E. SMITH

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

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

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

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

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

### CASE FOR PLANNING IN TRANSPORTATION SYSTEM MANAGEMENT PROJECTS

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

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