

# Highway Access Management: Preserving Public Investment in the Highway Network

Eric A. Ziering

Uncontrolled access to arterial highways from abutting development frequently results in rampant strip development in highway corridors. Traffic entering and exiting the highway through private access points interferes with the movement of through traffic, and the result is congestion and a reduction in the capacity and safety of the highway network. A prototype program for highway access management is introduced that uses regulatory mechanisms to minimize interference from private access points, thereby bringing about the more efficient use of the existing highway network and reducing the need for new highway construction or expansion of existing facilities. The legal access rights of owners of abutting land, the regulatory authority of state highway departments, and the role of cities and towns are identified as critical factors in the establishment of an effective access-management policy. A task list is presented that attempts to address each of these factors and resolve the conflicting goals of the state, local government, and private developers.

In recent years, transportation planners have had to work in a rapidly changing environment. The direct financial costs of large-scale construction projects have risen tremendously and will continue to do so. In addition, the indirect costs associated with these projects have also risen. The environmental and social effects of highway or subway construction must now be analyzed and accounted for in great detail. As a result, there has been a gradual shift away from large-scale, capital-intensive projects whose purpose is to add significantly to the transportation infrastructure. Short-range, low-capital projects intended to bring about the more efficient use of existing facilities are now considered more feasible from a variety of standpoints.

We have reached a point at which transportation investment must be reoriented toward these types of projects. The scope of new highway construction in the years ahead will be extremely limited as both direct and indirect costs escalate beyond the point at which such projects can be considered cost effective. The emphasis in highway planning must be placed instead on the maintenance of existing roads and on the use of techniques to improve traffic flow and increase capacity on the established network.

Regulatory strategies can also be effective in bringing about the more efficient use of existing facilities. One such strategy is management of highway access. Vehicles moving onto and off arterial highways reduce the effective capacity of the road because entering and exiting traffic interferes with through traffic. Through regulatory mechanisms, access to these highways can be managed in such a way as to minimize this interference and thereby increase the effective capacity of the highway.

The purpose of this paper is to present a prototypical policy for management of highway access that will result in the more efficient use of existing highway facilities. First, the goals and motivations of an access policy are presented. Then, some of the critical factors that influence the development and implementation of an access-management program are examined. Finally, a prototype program of access management, including a policy statement, organizational and political compo-

nents, and a task list for program implementation, is presented.

## DEFINITION OF ACCESS MANAGEMENT AND PROGRAM GOALS

Access management can be defined as the selective implementation of access-control techniques and regulations for the preservation of the utility of the highway network. These techniques vary widely, from highway design (the construction of median barriers or curbs) to those that are more regulatory in nature (restrictions on driveway location or use). For example, the Interstate highway system prohibits access except at designated interchanges, thereby providing a consistently high level of service. In this case, access restrictions are established on newly constructed facilities. More serious problems exist, however, on uncontrolled-access facilities where political, physical, or financial constraints prevent roadway expansion or reconstruction intended to provide additional capacity. Many of these highways have attracted substantial commercial growth and have experienced increased traffic volumes as more commercial establishments locate on land directly adjacent to the highway. These increased traffic volumes stimulate additional commercial development and thus bring about a still greater increase in traffic volume, which eventually leads to severe congestion and safety hazards in the highway corridor. Strip development along uncontrolled-access arterials is the most common manifestation of this phenomenon. Highways along which strip development has occurred are the prime targets of an access-management program.

A major objective of access-management policy is to preserve the traffic-carrying capacity of existing highways without requiring massive expenditures for reconstruction or expansion of these facilities. In more general terms, such a program is a mechanism for ensuring the most effective use of public investment in the transportation network. In addition, access management can result in greater coordination between the characteristics of the highway network and community growth and economic development within the corridor. Finally, it can bring about greater awareness among local officials of vital growth issues that must be faced in planning long-range community expansion.

The use of access management for the protection of the highway network is becoming much more common as a number of states recognize the potential benefits that such a program offers. In the state of Washington, direct commercial access to state highways has long been prohibited (1). The Oregon Department of Transportation has stated that "the department will make the maximum effort to protect and maintain the existing highway system so as to retain optimal conditions that will not be detrimental to the economy of the community and to the public well-being" (2). In conjunction with this, Oregon has an access-control program on all freeways and primary arterials and on many secondary arterials. Wisconsin has for a number of years had

laws that empower the Wisconsin Highway Commission to enact a comprehensive access-management policy. However, only recently has there developed momentum in this direction, primarily as a result of the interest of agencies other than the highway commission in the potential of such a program (3). In contrast, some states are beginning to recognize the need for access management on a much smaller scale. Tennessee, for example, has established cooperative planning procedures to minimize the potential dangers of unrestricted access along a single corridor of one state highway (US-129).

Although these states and several others have begun to examine the concept of access management, there are many more states that have not taken steps in this direction. Such efforts should be made before unrestricted access results in the functional obsolescence of major segments of the highway network at a time when major network improvements and expansion are not feasible.

#### FACTORS THAT AFFECT PROGRAM DEVELOPMENT AND IMPLEMENTATION

Access management can be viewed as a strategy that deals with problems related to the insufficient capacity of the highway network through low-capital, and primarily regulatory, mechanisms. However, many legal and political factors could potentially affect the implementation of a state program for management of highway access. This research has identified three such factors: the rights of owners of abutting land ("abutters"), the use of state regulatory powers, and the role of local communities in the development of an access-management program. Each of these is discussed below.

##### Abutters' Rights

The owners of land abutting arterial highways (other than limited-access highways) have, as a condition of ownership, certain property rights related to highway access. The interpretation of these rights varies slightly from state to state, but a general doctrine of the rights of abutters can be drawn from judicial decisions and judicial interpretation of existing statutes.

An abutter is entitled to compensation if

1. All access to the highway network is totally denied,
2. The access permitted the abutter is insufficient for the "highest and best use" of his or her property,
3. Special injury is done to one specific property through access restrictions,
4. The highway that fronts the otherwise landlocked property is rebuilt as a limited-access facility, or
5. Relocation of highway access points impairs the abutter's use of his or her property.

An abutter is not entitled to compensation if

1. Access is circuitous or reasonably regulated,
2. Access restrictions are sufficient for the "highest and best use" of the property,
3. No special injury is suffered,
4. A new limited-access facility is constructed on new right-of-way, or
5. Site design or parking-area changes required to improve the highway necessitate the relocation of access points.

Abutters have the right to reasonable access to the adjacent highway, not unlimited access. A critical is-

sue in the interpretation of this right is the extent to which the state or the highway authority can restrict it without compromising an abutter's rights and having to provide the landowner financial compensation.

The number and location of access driveways to a particular land parcel may be regulated by the highway authority. In addition, the access permitted to an abutter may be indirect or circuitous; that is, because of one-way streets, median barriers, or service roads, an abutter may be required to travel a longer distance than desired to get to his or her property. Direct access to a highway may also be denied if the abutter still retains reasonable access to the highway through the local street network. It has generally been left to the courts to determine, on a case-by-case basis, when access limitations are reasonable. Finally, reasonable restrictions on the design and construction of the driveway itself are appropriate uses of government regulatory power.

The access rights of abutters are protected by one general principle: The access granted to an abutter must be sufficient for the property to be developed to its highest and best use. For example, the owner of a shopping center cannot be restricted to a driveway of a size normally considered standard for a single residential home because it would not accommodate the large traffic flow normally expected at a shopping mall. If a land parcel is zoned for industrial or commercial development, or if there is a significant probability that the zoning might soon be changed to one of these designations, the property owner must be permitted access that is suitable to the type and quantity of traffic normally expected as a result of such development.

This obviously implies that there should be a strong relation between the capacity and design of a highway facility and the zoning of adjacent property. Because these two factors are frequently the responsibility of different jurisdictions, this relation is often unclear or nonexistent.

An abutter is not entitled to direct access to new limited-access highways or freeways. However, if an existing highway is redesignated as a limited-access way or if a new limited-access road is constructed on the right-of-way of an existing uncontrolled facility, then the owner is entitled to compensation for the loss of direct access. Finally, if an abutter has access to a highway that is in some way deficient or dangerous to the general public, that access can be revoked without compensation. In addition, if a highway department makes corridor improvements and decides to relocate existing access driveways as part of the improvement program, the abutter must pay all costs for laying out his or her property to use the designated access points. These two factors provide state highway departments with considerable leverage in making improvements to existing highways that have unsafe access patterns.

##### Role of the State

State highway departments and commissions have the responsibility for the design, construction, and maintenance of highways, including those on the Interstate network. Because of this, the primary concern of the state in relation to access management is the successful preservation of the functional capabilities of the highway network. There are a number of ways in which the state can successfully achieve this goal.

Each state has the ability to legislate and enforce regulations and restrictions on behalf of the public welfare as long as these regulations do not interfere with private property rights. The single most important regulatory process that should be used to manage high-

way access is the review of driveway permit applications.

Most states have at least a rudimentary procedure for the opening of new driveways onto state-controlled roads, although the actual procedures and regulations vary widely from state to state. Typically, a potential developer of land adjacent to a highway applies to the highway commission for a driveway, or "curb-cut", permit. This application is reviewed on the basis of specified criteria and is either approved or rejected by the appropriate office. When this review power is used correctly, it can be very effective in the management of highway access.

First, the permit process should specify design standards for driveways. These specifications should include the number of driveways permitted per parcel or per length of highway frontage, the visibility requirements, the spacing of adjacent driveways, and the dimensions of the driveway itself. These driveway standards should be linked to both the type of development being proposed and the type of highway facility on which the parcel is located. Large commercial or industrial developers may be required to provide left- and right-turn lanes and merge areas, whereas residential developers may not be required to provide such features for their access points.

Driveway specifications can most easily be linked to highway type by using highway functional classifications. In the state of Washington, for example, there are different sets of design requirements for driveways on primary arterials, secondary arterials, and local streets. In this way, requirements can be made more strict on roads that carry a higher percentage of through traffic so that interference from entering and exiting traffic can be minimized. On roads that function primarily as collector-distributors, these requirements are less strict and direct access is more readily available.

The permit process should explicitly set forth the power of the state to continue to regulate the location and use of the driveway after it has been constructed. In Alaska, for example, permit regulations state that the granting of a permit does not waive any state right to direct the removal, relocation, or maintenance of the finished driveway. In addition, driveway permits can be revoked if "the use and presence of the driveway or approach interferes with the required use of that portion of the right-of-way occupied by the driveway, or constitutes a hazard to traffic" (4).

Permits can also be limited so that they become void whenever the use of the land changes from what was described in the original permit application. In this way, a new development cannot automatically use the driveway or driveways from a previous development; the developer must apply for a new driveway permit based on the volume of traffic expected from the new development.

All of these driveway permit regulations are designed to ensure that the highway department has continuing control over the location and design of access points. Should the state at some time wish to make corridor improvements, its right to relocate, redesign, and, in some cases, remove existing access driveways has been clearly stated.

Some states have carried the regulation of driveway permits even further than this. In Oregon, for example, access points have been assigned to all land parcels that adjoin state highways, whether or not any development has taken place (5). This guarantees that all spacing and design guidelines can be safely met and requires potential developers to consider the location of the access point as a constraint in site design. There also exists a somewhat different permit process through

which landowners can request additional or relocated access driveways, subject to the approval of the highway commission.

In New Orleans, developers cannot obtain a building permit until they have received a driveway permit from the highway commission (1). This is an alternative way to ensure that developers consider driveway location during the design phase, since construction on the site is prohibited until the building permit is granted. Similar links can be made between driveway permits and land subdivision so that, when a large parcel is subdivided into smaller plots or home sites, access permits must meet with state approval before resale of the individual properties takes place.

In addition to driveway permits, the state has other regulatory controls over highway access. All state highway departments have the authority to establish traffic regulations, which generally include traffic signals, vehicle restrictions, and the construction of curbs, medians, and other barriers to control the flow of traffic. Although this authority is usually based on providing for the safety of the traveling public, enabling legislation for this authority should also define the preservation of the capacity of the highway network as a basis for these regulations.

Most state highway departments also have some legislated authority to construct limited-access highways (such authority was the basis for the construction of the Interstate highway system). This authority can be expanded to permit the designation of a network of controlled-access highways within the state (highways on which access is not totally restricted but is subject to strict regulation and scrutiny by the state highway department). Wisconsin has a statute that permits such a declaration to be made for rural portions of state highways whose average daily traffic exceeds some threshold, but there is no reason why this authority could not be expanded to allow any portion of the state highway network to be designated a controlled-access road.

Another source of state authority is the principle of eminent domain, which empowers the state to violate private property rights when it is deemed necessary in the best interests of the public at large and is usually used as the legal basis for taking land for some public purpose. It also requires the state to compensate the property owner for damage done or property taken. An obvious example of the use of eminent domain is the taking of land for the construction of a highway, but it can also be used more subtly to allow the state to "purchase" the right of access to a state highway.

As previously described, access can be restricted as long as these restrictions do not interfere with the abutter's use of his or her property. As soon as the restrictions become too strict, the individual's property rights have been damaged and he or she is entitled to financial compensation. Under eminent domain, the state can establish access regulations that would otherwise be considered illegitimate because the state repays the property owner for excessive damage done through those regulations. Therefore, whenever the state deems it essential to the public welfare that access be restricted past the point where the land can be developed to its highest and best use, it can invoke eminent domain to pay landowners for the damage that results from loss of access.

The disadvantage of eminent domain is that the amount of financial compensation required may be considerable. Where access is denied an otherwise landlocked parcel, all development on the site is effectively prohibited and the state for all practical purposes must buy the land from its owner. For a site that might potentially have contained a large commercial or industrial development,



this could be prohibitively expensive. In addition, excessive use of eminent domain would not be acceptable to local governments that may wish to encourage development.

### Role of the Local Community

Local communities must play a critical role in the development of an access-management policy. Even though their interests most frequently conflict with those of the state, local communities can benefit considerably from a state access-management plan that is properly targeted and implemented.

Establishing substantial industrial or commercial development in order to provide a sound tax base is often of primary concern to local communities. State highways that pass through towns provide ideal locations for such development, and any restrictions on access to these highways interferes with their potential for attracting industry or business. On the other hand, strip development along state highways is generally unattractive and blighting and undesirable to a community in spite of the potential tax benefits it may bring. A correctly designed access-management program can effectively prevent unrestricted strip development while permitting the economic growth that is essential from the local community's point of view.

Cities and towns can exercise several types of regulatory controls in support of a state access-management program. As mentioned earlier, building permits can be linked to driveway permits so that a developer must consider, as an important factor in designing a plan for the abutting property, the location of a driveway that is safe and that provides adequate capacity. Local zoning regulations can affect highway access in a number of ways. They can reflect support for the curb-cut regulations that have been established at the state level, either by duplicating those design requirements or by stating requirements for compliance with state standards for driveway permits. It is particularly important that local zoning codes affirm different sets of design standards for different types of development; the establishment of different regulations for different land uses is a long-established and well-accepted function of zoning regulation.

Zoning can also be used to encourage improved site and circulation-pattern design. Parking areas, for example, are frequently designed so that vehicles that are waiting for or moving in and out of parking spaces may interfere with traffic on the abutting road. In this case, it is not the availability of access that disrupts the highway but the way in which internal design affects the use of the access point. Zoning regulations could require that all vehicle parking be located at the rear of abutting buildings, away from the highway, or that sufficient vehicle "storage" be provided as a buffer to prevent vehicles that circulate on the property from interfering with highway traffic.

### Summary of Important Factors

In summary, then, many factors must be considered in the design and implementation of an access-management program. Owners of abutting land have the right to adequate access to the highway network and the absolute right to develop their property to its highest and best use. Government regulations and restrictions can therefore be used to limit access to some extent but, when the use of the property is interfered with, the landowner must be compensated for his or her losses according to the legal concept of eminent domain. State government has several regulatory mechanisms at its disposal.

Regulation of driveway permits is the most important of these, others being traffic regulation and the creation of limited-access highways. Eminent domain is invoked (a) whenever access must be so restricted that the abutter must be compensated, (b) when land is acquired for new highway construction, and (c) when limited-access highways are built in existing rights-of-way. Local communities play a critical role in access management because their goal of economic growth may conflict with any kind of access restrictions. On the other hand, local zoning and building regulation can give tremendous support to an access-management program if the program is designed in such a way as to support, rather than be in conflict with, local community goals.

All of these issues must be dealt with in the development of an access-management program. The successful implementation of the program depends on the explicit recognition of all of these factors.

### PROTOTYPE ACCESS-MANAGEMENT PROGRAM

Access management will of necessity become a major new focal point of highway departments. This will happen more quickly in some states than in others, and the specific techniques of access control that should be used will also vary, depending on the size of the state highway network, the intensity of development along the network, and constraints on budget or personnel levels. Because this variation may in some cases be great, the access-management program presented here is more correctly described as an open framework in which states can develop comprehensive, individual programs that properly address their own specific needs and problems.

Access-management programs will almost certainly be moderately capital intensive in nature. Although many of the strategies encompassed by such a program are regulatory and therefore have no associated capital expenditures, successful program implementation will require substantial commitments of funds in the following areas:

1. Personnel expenses will be substantial. Large staffs will be needed to oversee and administer the access program and to participate in the educational and cooperative planning programs that are outlined later in this paper.

2. Eminent domain will be invoked to some extent by nearly all states that are involved in access management, although this again will vary from state to state. In more highly developed states, the funds required to compensate property owners for loss of or damage to their property may be quite substantial, particularly if eminent domain is used along entire highway corridors.

3. Funds will be required for construction projects when states deem it necessary to expand or make other improvements in an existing corridor.

Highway planners must come to the realization that a substantial commitment of funds may be required for the successful implementation of an access-management program. Even though much of the personnel and funding could actually be supplied by shifting resources from existing construction and maintenance efforts to the new program, this would often prove difficult to accomplish. There must be strong support for the program, both from the leadership in the state highway department and often from the state legislature, which must allocate funds for the program.

It is worth noting that an access-management pro-

gram, although primarily regulatory in nature, is in several ways very different from strategies that are grouped in the transportation system management (TSM) category. The goals of both are similar in that they attempt to avoid large capital outlays through the more efficient use of existing facilities, but past this point the resemblance begins to break down. Most TSM-type projects are relatively small in that they may address a single facility (e.g., an exclusive bus lane along a highway corridor) or a single geographic area (e.g., automobile-restricted zones). In addition, most TSM projects are short range and easily reversible if not successful. Access management, on the other hand, is a comprehensive, statewide effort that is much larger in scope than most TSM projects and cannot be discontinued in the way that most TSM projects can. As a result of their size and other characteristics, access-management programs are also far more expensive than normal TSM projects; as mentioned earlier, significant capital expenditures may be required in some states for successful implementation.

Now that some of the broader descriptors of an access-management program have been examined, a fairly specific implementation plan can be outlined. The plan presented here is not intended as a step-by-step instruction manual on access management, but it does identify several specific tasks that must be accomplished. These tasks can generally be placed in one of three categories: program management, planning coordination, and program implementation.

#### Program Management

Program management encompasses all tasks that are primarily administrative in nature. The most important of these tasks is the development of a policy statement on access management. The policy statement should cover several major areas: It should define the goals of the access-management program, describe the important interest groups and summarize their concerns, and identify the various mechanisms through which the program will be implemented and enforced. Because the function of the policy statement is to serve as a unifying base for the entire program, it is important that it be given strong support by a variety of institutional sources, including the highway department, the state legislature, the governor's office or staff, local governments and zoning boards, and regional and local planning agencies.

A second major task is the allocation of responsibility for program execution. Generally, some branch of the highway department will be the lead group, but many other branches may also be involved. It is the responsibility of the lead group to identify the roles of all participants. Review of driveway permits, legal support, state-local coordination, and enforcement, in addition to more obvious tasks such as network planning, should be assigned to appropriate groups or agencies. These assignments depend heavily on the existing institutional structure in each state, but it is probably most beneficial to keep most of these functions centrally located in a single division or office so that the policy statement is not interpreted differently by separate groups.

A third task in program management is the implementation of legislative and regulatory changes that provide the state with adequate levers of control over highway access. Some states, such as Wisconsin, may not need any significant changes in existing laws or regulations. Others, such as Massachusetts (6), may require some clarification of existing statutes as well as significant regulatory changes. Still other states may require even more dramatic revisions. In any case, all

laws and regulations should be tied directly to the highway department's policy statement on access management, clearly spell out the responsibilities of all actors, and identify all design standards and requirements.

There are two major benefits to be gained from this task:

1. Because all design requirements are clearly spelled out, developers and local communities will be able to plan development with no uncertainty about access to the highway. Since access decisions will not be discretionary, investment decisions and site design can be based on the established regulations.

2. Because all statutes and regulations are unified under the policy statement, court decisions on individual cases in which access has been restricted may be more supportive of the highway department. Without a comprehensive program, individual landowners are more likely to be awarded damages if their access is limited while their next-door neighbor's is not. But, if these access restrictions are applied broadly to many property owners in support of the welfare of the general public, the courts will be less likely to award damages.

A final project-management task is the development of local regulations in support of the state access-management program. This task requires a substantial amount of interaction with regional and local officials and is critical to the successful implementation of the program. As mentioned earlier, local zoning regulation can circumvent the state's best efforts unless it is tied in with the state driveway specifications in some way, so the importance of local support for the state program cannot be overstated. Ideally, local regulations should ensure that building permits cannot be obtained without a valid driveway permit and that all development conforms with state standards for driveway location and design. In addition, zoning requirements regarding site design and circulation patterns within the development can yield additional benefits in reducing the amount of interference between through traffic and traffic moving onto or off the road. To a large extent, the successful establishment of these local regulations depends on the planning coordination tasks outlined below.

#### Planning Coordination

Planning coordination includes two major tasks. The first of these is the establishment of educational programs through which the access-management program can be described and justified for local and regional planners. Many local officials are unaware of the importance of highway access as it affects highway capacity and safety as well as local development and economic growth. They will probably react negatively to an access-management program because the use of access controls implies that restrictions will be placed on local communities by the state. An educational program should stress the potential benefits that local communities can experience through access management, such as the control of strip development, and should emphasize that access controls are not intended to interfere with economic growth and development but only to ensure that this development takes place in such a way as to maintain the functional capability of the highway network.

It is as part of this task that a major institutional conflict must be resolved. Cities and towns see it as the state's responsibility to provide adequate highway transportation and to make improvements where the network is congested or otherwise deficient. The state, on the other hand, interprets extensive development by cities and towns as something that is damaging to the highway net-

work and does not feel that it should be responsible for improving portions of the highway network in locations where local government's encouragement of extensive development generates traffic that exceeds network capacity. Clearly, some balance should be established so that the state bears its responsibility for the maintenance of the highway network and the community encourages well-planned and directed growth that does not conflict with the responsibility of the state.

A second major task in this category is the establishment of cooperative planning among the state highway authority, local planners, and developers. Establishing updated statutes and regulations—setting the ground rules for development—will aid significantly in this task, although local planners and developers may resent the establishment and enforcement of such regulations. Cooperative planning efforts by the state, however, can help to show other interest groups how to successfully accommodate development while complying with the established access regulations. A good example of this kind of cooperative planning occurred in Tennessee along US-129, where the state highway department, in conjunction with new access regulations, provided preliminary site-planning assistance to owners of abutting land. The landowners were then free to take any acceptable design ideas to other companies for further development.

By assigning staff members to work with local officials and developers, a state highway department can help to ensure that local groups will know about potential projects early in the planning stages so that they will be able to provide input to the developer's initial site design or to a community's land use plan. In addition, building a good working relationship with local planners will help to streamline the establishment of local regulations in support of the entire access-management program.

#### Program Implementation

Program implementation incorporates a number of tasks that will vary from state to state. The first is a highway survey that examines all portions of the state highway network. Each highway segment should be classified as to the size and capacity of the road, levels of existing and potential development, existing and potential safety hazards, and functional classification. When this is completed, certain highway segments may be identified as being of critical importance. For example, a roadway segment that is undergoing heavy strip development and may soon become congested would be a target for immediate action under the access-management program.

When the highway survey has been completed, the state must proceed with the development of a master plan for state highways. It is in this area that substantial variation among states will occur. Some states may find it necessary to declare a network of state highways to be controlled-access highways and develop standards and specifications appropriate to that designation. Other states might declare certain segments to be controlled-access highways and develop a long-range program for the acquisition of access rights on less critical portions of the network. Still other states might find it necessary to apply access controls only on a spot basis. These decisions must be based on a wide variety of factors, including existing and predicted traffic levels, development potential, and fiscal and personnel constraints that might limit the scope of state activity.

Finally, the state must develop a programmed implementation plan that specifies the state's priorities in establishing the access-management program. For example, a state might declare its first priority to be the purchase of access rights along rural portions of

state highways and its second priority to be the construction of service roads on critically congested portions of the network. These projects must be programmed so that the projects that are given priority are matched with expected funds and scheduled for implementation at some point in time. Again, it is expected that priority rankings will vary widely among states. More urban states, for example, would probably not give high priority to corridor improvements in congested areas where strip development has occurred because the required expenditures for such a program would be enormous. These states might prefer instead to concentrate on stricter specifications and review of driveway permit applications.

#### Task Summary

The program tasks described in the preceding discussion can be summarized as follows:

1. Program management—(a) development of a policy statement, (b) allocation of responsibility for program execution, (c) implementation of legislative and regulatory changes, and (d) development of local regulations;
2. Planning coordination—(a) development of educational programs and (b) establishment of cooperative planning; and
3. Program implementation—(a) state highway survey, (b) development of master plan, and (c) programmed implementation plan.

Although this list is not exhaustive, it does include those tasks that are most critical to the implementation of an access-management program. It is clear that the efficient use of the highway network through primarily regulatory means is an institutionally complicated procedure. The interests and jurisdiction of many groups must be accounted for, and the establishment of working relationships between these groups is essential.

#### CONCLUSIONS

Because the network of arterial highways in this country is an essential portion of the transportation infrastructure, the preservation of the network is critical. The single most important factor in maintaining a high level of service is the effective management of access to these highway facilities. It is widely observed that the availability of uncontrolled access to a highway from commercial, industrial, and/or residential property can lead to rampant strip development along the highway corridor. The movement of vehicles through these strips causes congestion and increased safety hazards and results in severe deterioration in the level of service provided by the arterial.

Strip development and its associated congestion were once alleviated by constructing bypass routes along new rights-of-way, but increased costs have made this impractical. Now, it is essential that this type of deterioration in highway service be prevented. Through management of the availability of access to the highway network, economic development and community growth can still be achieved, but the negative effects of this growth on the capacity of the highway network can be minimized.

A key issue in the development of an access-management program is the property rights of owners of abutting land, which include their right of reasonable access to the highway network and the right to develop their property to its highest and best use. Through regulatory mechanisms, the state can limit abutters' access until one of these two rights has been violated, at which time eminent domain must be invoked and the



landowner compensated for damage done to his or her property.

Another issue in developing an access-management program is the conflict between the state's desire to maintain the highway network and the desire of cities and towns to use the network as a basis for development. The use of local regulatory controls becomes extremely important because they are capable of severely affecting the potential success of an access-management program.

The prototype access-management program attempts to recognize these major factors and present a list of important tasks that are critical to successful program implementation. Because states vary widely in their need for access management, the task list is not intended to be exhaustive but merely representative of what a state must accomplish. Given the current environment of transportation planning, the level of effort required to accomplish these tasks will increase as access management becomes more important in future years.

#### ACKNOWLEDGMENT

This paper was prepared while I was with the Transportation Systems Division, Department of Civil Engineering, Massachusetts Institute of Technology. This research was supported by the University Research Program of the Urban Mass Transportation Administration

(UMTA). The views expressed are mine and do not represent the views of UMTA.

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*Publication of this paper sponsored by Committee on Transportation and Land Development.*

#### *Abridgment*

# Accommodating Urban Development While Preserving Close-In Natural Landmarks

Romin Koebel

The importance in the life of cities of preserving open space and saving endangered natural landforms is examined. The spatial development of Columbus, Ohio, and the effort to preserve that city's natural topographic features in conjunction with development are cited as an example. The part played by the concept of transfer of development rights in preserving natural landmarks is also discussed.

Open space, plazas, and natural areas enhance environmental quality, amenity, and area ambience. In the past, cities have gone to great lengths to create open space: Georgian London laid out handsome residential squares; in Paris, French noblemen created Renaissance plazas where there had previously been urban squalor. Provision of open space has figured prominently in recent strategies to rehabilitate the quality of the spatial environment. Boston's Government Center Plaza and lower Manhattan's Chase Manhattan Plaza, carved out of the existing urban fabric, triggered dramatic economic revival by restoring confidence among investors and builders. As rehabilitated structures and new, privately financed construction quickly surrounded the new spaces, real-estate tax revenues soared.

In Columbus, Ohio, the configuration of the water-

course system and its associated landforms profoundly affected the evolving spatial pattern of the city. The original grid, aligned perpendicular to the bridge across the region's principal watercourse, established the directions of the region's two main growth shapers, High Street and Broad Street. For a while, these axes, intersecting at right angles and offset from the principal points of the compass, governed the alignments of new plats. But, as expansion continued, development began to be aligned with the all-encompassing national grid. Older pockets of development, such as outlying North Columbus with its skewed grid of small, square blocks, were enveloped by the new pattern.

"Breaks" occurred at the interfaces between different gridirons. Glen Echo Ravine, deeply indented in the bluffs above the meandering Olentangy River, was once part of a popular amusement park at the end of the streetcar line. A major break occurred where Glen Echo Ravine intervened in the path of northward development along High Street. There was conflict between the geometries of interpenetrating grids, which resulted in a wedge-shaped fracture zone with offset intersections; small, odd-shaped blocks; and a medley of incompatible uses. Although one artery is aligned to the regional