Comprehensive Access Management
An Alternative To Highway Construction

Until recently, strip development has been viewed primarily as a land use issue. Such development does, however, have a strong relationship to the transportation system. Methods for dealing with the effects of strip development on roadways have rarely been handled in a consistent manner. Access management is a method for controlling the impacts of strip development on the roadway system which effectively balances the access needs of the roadway.

Without an effective access management program, demand for road improvement usually increases. Increased traffic volume, moreover, improves business exposure as well as demand for roadway improvements and widenings. This cycle is indicated in Figure 1.

It is not always increased traffic volumes that cause the demand for roadway improvement and widening. An increase in access points to a roadway causes a rise in the number of potential conflict points on a road. Conflict points are locations at which accidents may occur. Furthermore, at every access point, traffic on the road may have to slow down to allow vehicles to enter or exit the road. The increase in potential accident locations and the reduction in efficiency of the system causes a demand for increased roadway capacity. Figure 2 illustrates an often used management strategy -- the reduction of conflict points when left turns are eliminated.

Traditionally, the demand for increased roadway capacity has been met by adding lanes to an existing road or constructing new roads. An effective access management program can significantly reduce or postpone the fiscal, environmental, and social costs often associated with uch roadway modifications. Access management can eliminate the need for new right of ways and the resultant social displacement of some traditional roadway modifications. An efficient roadway system can also reduce the air pollution that is associated with the arterial roadways in typical strip development. Unfortunately, roadway efficiency is inversely related to the degree of access to a road.

METHODS FOR DEALING WITH THE EFFECTS OF STRIP DEVELOPMENT ON ROADWAYS HAVE RARELY BEEN HANDLED IN A CONSISTENT MANNER

Different roads serve different access needs. Controlled access freeways have operating efficiency as their highest priority. Residential streets have access as their clear priority. The mixed needs of collectors and arterial roadways make them the most difficult elements in an access management program (Figure 3). This article deals primarily with these types of roadways.

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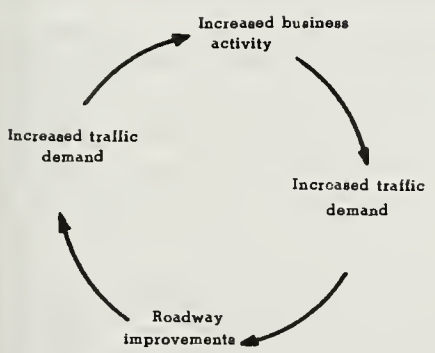


Figure I BUSINESS GROWTH - ECONOMIC CYCLE

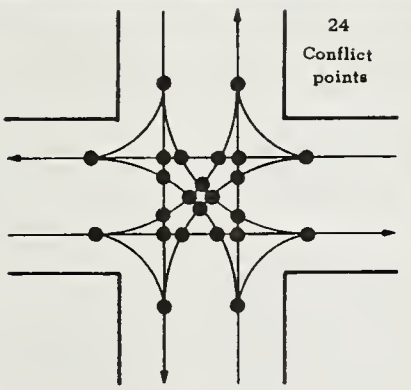


Figure 2a CONFLICT POINTS AT A TYPICAL FOUR-WAY INTERSECTION

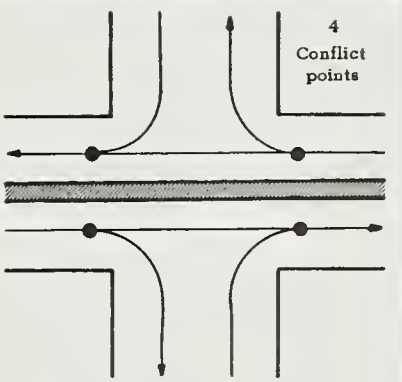


Figure 2b DRIVEWAY INTERSECTION WITH RESTRICTED ACCESS

The Optimal System

The best possible system balances efficiency and safety against access requirements of the adjoining properties. Cooperative, legislative, enforcement, and technical aspects are considered in creating a balanced access management program.

It is critical that the access management program be coordinated within the larger planning process by a well-defined policy adopted by all agencies. Often the access control policies

"A SUCCESSFUL ACCESS MANAGEMENT PROGRAM COORDINATES THE LOCAL LAND USE PLAN WITH THE OPERATIONAL OBJECTIVES FOR THE ADJOINING ROADS."

of states, counties, and local jurisdictions are in conflict. Most major arterials are constructed with federal or state funds, with the state transportation agency retaining jurisdiction over the highway.

Highway officials concern themselves primarily with the transportation efficiency of the roads; property owners feel that ownership implies unlimited access; and local officials feel a responsibility for both economic development and an effective transportation system. Zoning for strip development along a limited access roadway spells disaster for an access management program. These competing interests often work at cross purposes to the detriment of all concerned. A successful access management program coordinates the local land use plan with the operational objectives for the adjoining roads.

Legal Issues

Many legal questions exist concerning the power of the state to control access of properties adjoining a state highway. A basic legal concept to address is that the owner of the property abutting a state highway is entitled to reasonable access. The critical issue is the definition of reasonable, which is ultimately left to the courts. Past experience elicits some useful principles:

- The number and location of access points to any parcel may be controlled by the state
- Access may be denied if the property owner has reasonable access through the local street network
- If an access point is relocated the property owner must pay for any interior site modifications resulting from the relocation
- If an access point is dangerous, it may be revoked without compensation

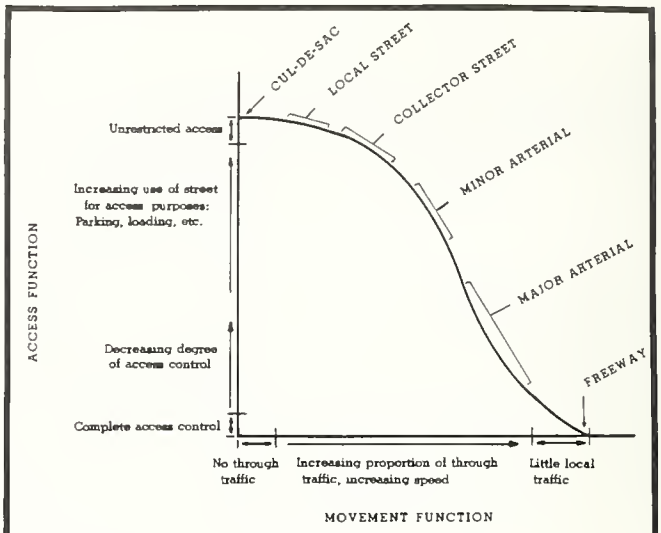


Figure 3 RELATIONSHIP BETWEEN CONTROL OF ACCESS AND TRAFFIC MOVEMENT

- The permitted access need not be direct
- If an existing highway is redesignated as limited access, the owner of the abutting property is entitled to compensation
- An abutting property owner is not entitled to access to a new limited access highway
- Access provided to a property must be suitable to the type and quantity of traffic normally expected as a result of such development

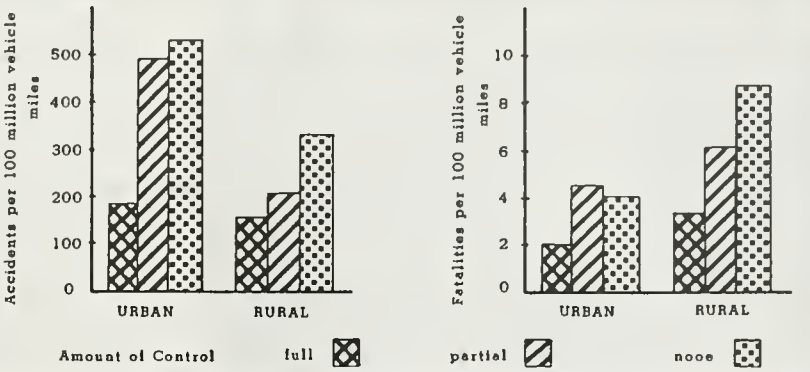
Legislative aspects in creating an access management program involve establishing goals, defining the mechanism for accomplishing those goals, the legal basis for the program, and ensuring uniform application of the code. An effective access code must be flexible enough to

"PRACTICAL ENFORCEMENT IS OF PRIMARY CONCERN IN THE COMPOSITION OF THE ACCESS CODE."

be applied in all the necessary situations, in order to eliminate all arguments of arbitrariness. To accomplish these ends, the code elements must be based on engineering and design criteria as well as upon the designated function of the roadway. The recently-adopted access code used in the State of Colorado will be considered as an example of such a code.

The State of Colorado Highway Access Code contains four sections addressing each aspect of access management. The first section summarizes the intent and contents of the law. Section Two involves the administration of the code and explains the process for variances and appeals. The third section classifies each section of the state highway system into one of five categories

Figure 4
EFFECT OF CONTROL OF ACCESS ON ACCIDENTS AND FATALITIES IN URBAN AND RURAL AREAS



in accordance with the functional characteristics of the road, as well as the design standards for each access category. Section Four of the Colorado code details the design standards and specifications for each access type classified in Section Three.

Restricting access is an appropriate use of governmental power. The majority of access control techniques can be enforced through police powers. Eminent domain may be used when the acquisition of private property rights is necessary to implement an effective management technique. This usually requires some compensation to property owners by the state. If enforcement of an access code proves unwieldy, it will in all probability be the death knell of the program. Practical enforcement is of primary concern in the composition of the access code.

Elements of Access Management

The four basic elements of access management are briefly discussed below.

1. Driveway Design Standards. These have an impact on roadway efficiency and safety. Driveways should be located as far as possible from intersections. This prevents conflicts from vehicles attempting to break into a queue at a traffic signal. The width and turning radius of an access point determines the entrance and exit speed of vehicles using that access. An inadequately designed access will disrupt the flow of traffic on the road. A smoother flow of traffic is created by limiting the number and spacing of driveways. This allows for more efficient timing of signals and fewer deceleration points on the roadway.

2. Median Construction. Left turns cause the majority of accidents on arterial roadways. Use of medians can reduce these accidents by controlling, channeling, and eliminating the left turns. Traffic then flows more efficiently. Use of raised medians is often controversial in that it may significantly affect sales for certain types of businesses.

3. Frontage/Service Roads. This is the most expensive and time-consuming access control measure. Most effective on high speed roadways, this technique allows for the complete separation of local access points from the roadway. It significantly increases flexibility in determining the best access points, thereby increasing traffic efficiency and safety.

4. Miscellaneous. Several other tactics fall under the access management umbrella. These include installation of signals at access points, designation of one-way roads, removal of parking from the roadway, and adequate internal design of adjoining developments.

Summary

An access management program can be a low cost method for maintaining and improving the safety and efficiency of the roadway system. Figure 4 illustrates the effect of various degrees of access control on accident and fatality rates.

The attractiveness of such a program is that it entails no massive capital outlays. It may be implemented as maintenance modifications are required on existing roads, or as new facilities are planned and designed. Without a doubt, implementation of such a plan is very political. Controversy usually results when the status quo of property rights is threatened. However, with proper social, engineering, and economic analysis, as well as thorough public participation, comprehensive access management can be used as an effective and economical step in the process of transportation planning.

This paper draws heavily from Access Management for Streets and Highways, a manual published by the U.S. Department of Transportation in 1982. The United States Government does not endorse products nor manufacturers. Trademarks or manufacturer's names appear herein only because they are considered essential to the object of this document.