

Bridging the Gap Between Access Management Ideals and Land Use Planning Practice: Suggested Policies and Potential Benefits

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Access management has become an increasingly important and controversial issue for the state of Iowa and other states across the nation. Implementing access management can be beneficial in several ways, including improved traffic safety and operations, higher quality corridor development, and the avoidance of more expensive and damaging methods of capacity improvement. One of the major obstacles to the successful implementation of access management principles is the significant disconnect between the agencies that administer roadways and those responsible for local land use planning and regulation. Bridging this gap is clearly a key to safer and better functioning roadways. Making this connection, though, has proven to be a difficult task. The solution involves, among other things, improved communication between road jurisdictions and local planning agencies. A first step toward improved communication is the identification of current "best practices" as models for localities in Iowa to use. Next, a process for identifying future transportation and access conflicts is necessary. Such locations could then be designated as priority areas for increased interaction and coordinated planning. Finally, designating the best possible treatments to apply on such access projects could be accomplished through a more systematic approach. Bridging the gap between access management and land use can produce significant benefits in the success of long-range land use planning, as well as in the functioning and safety of transportation facilities. These benefits are applicable to areas within Iowa, as well as in other parts of the nation.

ACCESS MANAGEMENT BASICS

One of the most difficult problems in roadway administration and design today is balancing the dual function that many roads have: serving through traffic while providing access to property. Providing inappropriate or excessive access to property on arterial roadways can lead to increases in crashes, delays, and traffic congestion. According to the Federal Highway Administration:

"Access Management is the process that provides access to land development while simultaneously preserving the flow of traffic on the surrounding road system in terms of safety, capacity, and

speed. It attempts to balance the need to provide good mobility for through traffic with the requirements for reasonable access to adjacent land uses" (1).

Access management involves carefully planning direct access from property to adjacent roadways. By doing this, the number of conflict points that lead to opportunities for accidents are reduced. Therefore, access management projects are designed to serve one main purpose: reducing conflict points. Six general types of treatments or retrofit projects are most commonly used in the state of Iowa. These six major treatments are often used in combination with each other and along with other roadway improvements to help manage access along arterial roadways:

- Driveway consolidation: Designed to limit the number of driveways per mile and provide adequate spacing between driveways.
- Corner clearance: Involves removing or relocating drives away from intersections or to better locations on side streets.
- Continuous two-way left-turn lanes: Adds dedicated turning lanes in the center of a three or five-lane roadway to separate left-turns from through traffic.
- Alternate access ways (frontage or backage roads): Adds alternate roads off the main traveled roadway that function to separate turning and through traffic completely.
- Raised medians at intersections: Provides for limited installation of barriers near intersections that prevent some turning movements near intersections.
- Full raised medians: Add barriers in the center of a major roadway that prevent left-turns and cross traffic and eliminating a considerable number of conflict points.

BENEFITS OF ACCESS MANAGEMENT

Implementing the principal techniques of access management can be beneficial in several ways. First of all, access management can have significant positive impacts in terms of safety, congestion reduction, and lessened delay (2). In addition, there are numerous secondary benefits that can be accrued through improved management of access. Among other benefits, the use of access management techniques may ultimately promote corridor redevelopment. These basic access management principles can also be effectively used to avoid more expensive and environmentally damaging methods of capacity improvements. There are also possible indirect benefits resulting from access projects. Such benefits may include

the overall investment in transportation infrastructure and lessened auto emissions due to delay and congestion.

In the state of Iowa, a number of these benefits have recently been quantified through a joint study conducted by the Iowa Department of Transportation, the Access Management Task Force, and the Center for Transportation Research and Education (CTRE). The Access Management Task Force, made up of private and public sector representatives, worked cooperatively with the other entities to develop a work plan that would guide research, education, and outreach activities related to access management. Phase I of this study, called the Iowa Access Management Awareness Program, resulted in the publication of two reports. First, a literature review covered the relevant access management sources to assist in refining the research agenda (3). Secondly, a report was developed on current access management policies and practices in the State of Iowa (4). This second report concluded that there is a significant disconnect in Iowa between roadway administration (e.g. driveway permitting and control of access rights) and land use regulation (e.g. master planning and local zoning). The integration of this vital transportation issue and land use planning was one of the major reasons behind the Iowa program. The principal potential impacts of access management were divided into three categories in the literature review: traffic safety, traffic operations, and business vitality. These topics were addressed in a report on Iowa case studies with an emphasis on safety and business vitality, since traffic congestion is not a serious problem in most places in Iowa. Results from the case studies indicate that (2):

- A typical access management project in Iowa may reduce annual accident rates between 10 and 70 percent. The average reduction in accidents for all projects is around 40 percent. Both personal injury and property damage only accidents are reduced significantly.
- Access management projects raised the level of traffic service to motorists during the peak hour along a corridor by one level, providing significant benefits in terms of increased operating speed and reduced traffic congestion.
- Access projects are often controversial among local businesses because of a perceived potential for lost business. However, corridors where projects have been completed actually perform better in terms of retail sales than their surrounding communities. This indicates that access management projects generally do not have an adverse effect on the majority of businesses. Some individual businesses may be affected, however the number is small.
- Around 80 percent of businesses reported sales at least as high after the project was in place. Few businesses reported declines associated with the projects. Similarly, about 80 percent of businesses reported no customer complaints regarding access to their businesses after projects. The businesses that report complaints are highly oriented toward drive-by traffic.
- Motorist opinions of the access management projects studied were highly positive. In all cases, 90 to 100 percent of motorists surveyed had a favorable opinion of access improvements made. The vast majority of motorists agreed that the improved roadways are safer, operate better, and are easier to drive on.

The result of the business vitality related analysis points to another important aspect of access management. Access management can have a very positive impact on overall corridor development. As a secondary benefit of improved traffic flow and safety, access management can promote a healthier business climate along an improved corridor. Some evidence from the Iowa projects shows that business re-development, investment, and revitalization begin

to occur a few years after access management projects are completed. Another important benefit of access management is the reduced cost of new roadway construction. Today, we are seeing a paradigm shift in how we approach our transportation system. As our system has matured to its current level, we have turned to updating, managing, and improving the current network instead of more new construction. While construction costs are rising, access management projects are much less costly. They also reduce the need for displacement of businesses and homes often necessary with major widening projects. Some of the cost of additional right-of-way may also be avoided, although not entirely. Because of these factors, access management techniques and projects are becoming more attractive to transportation officials.

Access management can also potentially promote less environmental impact and more sustainable development through its positive effect on the movement of many different types of transportation modes. First of all, alternative forms of transportation will also benefit from safety and decreases in delay. Public bus transportation, for example, can directly benefit from reduced travel time, congestion, and delay. For public transportation, reduction in travel time is a key factor in increasing ridership. Bicycles and pedestrians can also benefit in some ways from access projects. In a corridor that has been improved, cyclists face fewer decisions and conflict points as well. With access improvements, bicyclists would have to deal with fewer driveway locations and turning movements and consequently more predictable motorist travel patterns (5). In addition, these projects can have a lesser effect on the environment than major new construction or other reconstruction.

Finally, access management can ultimately be an effective tool in protecting the public investment. Access management is a method of promoting a maximum return on the highway system (6). Ultimately, all these potential benefits resulting from sound access management techniques can have a significant impact in numerous areas. From the direct traffic and safety benefits to the potential reduction in automobile emissions, the benefits of sound access management are extensive.

CURRENT PROBLEMS

Assuming that access management is a beneficial activity in terms of safety, traffic operations, and other areas, there are certain barriers that remain. These barriers are what keep transportation programming and land use planning apart. The survey of Iowa communities mentioned earlier identified this gap, but at the same time, the survey concluded that city and county officials in Iowa see access management as an increasingly important issue and as a high priority for action (4). The survey of Iowa cities and counties also found four fundamental legal aspects of access management in Iowa. First of all, access management is exerted initially at the state level through enabling legislation. Secondly, state's enabling legislation can dictate the level of power given to local jurisdictions. In Iowa there is significant latitude given to counties and cities in terms of access management. Thirdly, there are definite legal implications of managing access. A "taking" may potentially result from insufficient compensation to private property owners for using their land for a public purpose (4). Lastly though, land use planning techniques can be used to promote proper access management and provide consistency in legal and regulatory practices.

In most cases in Iowa, larger city and county governments do have ordinances pertaining to some aspect of access management;

however, these ordinances have little direct relationship to an overall transportation plan. Most local ordinances in Iowa do not fully utilize the powers granted by the Code of Iowa for controlling access. There is also no consistent process used by roadway jurisdictions to review local access-related changes to roadways, except at the point when driveway permits are being sought by landowners (4). At this point, the involvement is very often too late. These transportation plans must incorporate access management as an integral part of the process. This can only be realized by the involvement of land developers, local planners, and state transportation planners as early in the planning process as possible.

In Iowa, there are also very few examples of a community incorporating access management elements within their comprehensive planning activities, but this is clearly another way in which access ideals can be used at the local level (4). Other local planning methods such as land division techniques, subdivision regulations, permitting of access locations, driveway spacing requirements, and overlay zoning, are possible ways to supplement access management strategies. The environment for applying access management principles is similar in other states to that in Iowa. Therefore, coordination of access management policies among local agencies and other agencies involved is the key challenge for most states wanting to administer access management programs.

In order for access management activity to be viable and acceptable to potential developers, they and the public should also be involved at the earliest possible stages. Transportation planners and engineers must work together and consider impacts of access decisions on the surrounding land use and development. Too often in the past, it has been an afterthought or no thought at all. Therefore, it is necessary to integrate all of these areas and develop a system which will use input from several important and often overlooked sources, and include these important players earlier in the planning process. This does make conflicts and legal challenges less likely, though there have been few legal challenges to create case law in the state of Iowa to date.

A NEW APPROACH

The apparent disconnect between transportation ideals and practice is an obvious problem. There are several potential and important ingredients to building a solution to this problem. All of these elements must, most importantly, involve improving communication between all parties involved. This new approach, integrating many ideals learned from studying access projects and the issues that surround them, can be formulated into a simple process involving three main steps. This new integrated transportation planning process would include more well-defined steps and more extensive involvement by all those affected by any access-related decision.

The first, and very crucial, step in approaching access management involves the strengthening of the transportation planning process itself. Once again, improved communication and involvement at every level of the process is vital. In a few places there do exist processes that work well and provide sufficient involvement (7). The first action, which is currently underway in the state of Iowa, is the identification of such "best practices" and the subsequent integration of these elements within local land use practice. In other words, these "best practices" may be used as models for other localities in Iowa to use. Through projects such as the Iowa Access Management Research and Awareness Program parties at every level

of the process are being educated about the potential benefits and subsequent need for good access management techniques through an outreach effort. Specifically, a new set of educational materials is being designed in Iowa to demonstrate the benefits of coordinated access management to both local land use planners, government officials, transportation engineers and planners and local officials.

The next major step in improving access problems statewide is to identify the major problem areas. These are the roadway sections that are most likely to benefit from the principles of access management. In the past, most major access projects in Iowa have been accomplished through the Transportation Safety Improvement Program of the Iowa Department of Transportation. This safety-driven approach was understandable given the substantial safety benefits of access management. However, this approach downplayed the other potential benefits, and was primarily reactive rather than proactive. A more systematic and logical approach to identifying access problem areas is needed. This new approach must create a typology of practices to match best practices with community attributes. Such a systematic process for identifying such problem areas could be most readily implemented through the use of Geographic Information Systems (GIS) technology. GIS has the ability to analyze several different sets of information spatially to determine the potential relationships between factors such as driveway placement and traffic volumes.

This GIS-based approach would involve the integration of several data sets, as well as the expertise and ideas of those professionals most involved with handling access management issues. A delphi method approach could be utilized to assemble ideas and to create a basis for weighting the importance of the multitude of factors which affect the functioning and safety of roadways. It is first necessary to identify, through interviews and case study analysis, which potential factors and subsequent data elements are most important in locating potential access-related problem locations. In other words, it is necessary to determine which factors contribute the most to access problems, and to what extent. Base record data is available for many of the different factors involved in "creating" an access problem. Data sets to be considered in this step are traffic volumes, roadway classification, speed limit, current land use, future land use, access points per mile, and number of lanes of through traffic.

The next logical action would be to query a variety of these relevant data sets to make an initial identification of potential problem roadways. Data elements that would be queried at this initial stage include roadway classification and traffic volume (AADT). Roadways such as local streets with very low daily traffic volumes and completely access controlled interstate highways would be eliminated at this step. Both of these roadway types fall outside the realm of where roadway function and need for access conflict (4). The relationship between traffic movement and property access is shown in Figure 1.

The next action would be to query these most likely problem roadway links through further data elements; such as number of accesses/egresses, roadway section length, number of lanes of traffic, and current and future land use. Combining these first two data elements would provide a rough estimate of access points per mile. With this knowledge and the number of lanes, a rough estimate of overall conflict points could be established. This estimate would provide a useful index of potential access management problems. Further iterations involving specific levels of traffic would give more specific ideas of potential locations of serious conflict prob-



Figure 1 Relationship between traffic movement and access.

lems. Other data elements, such as current and future land use developments and access-related accident data from GIS-ALAS could also potentially be used for the identification of future access problem areas. This approach, using GIS based tools, would provide a more systematic way for a state or other agency to focus on the most serious potential access problems. This method could then be instrumental in identifying where future transportation and land access conflicts have or are most likely to arise statewide, such that a state Department of Transportation could designate them as high priority areas for increased interaction and coordinated planning.

The third major step in the implementation of access management ideals is the actual application of the best possible methods or treatments for managing access at a specific location. Fitting the best techniques to specific situations is an important part of the process. Through research and data collection into successful and unsuccessful uses of access management techniques, general rules of thumb can be identified. One approach to this step would be the

implementation of an “expert system” to model a procedure for determining the preferred access management applications at specific locations identified by the previous step.

CONCLUSION

Bridging the gap between access management transportation planning ideals and actual land use practices can produce significant benefits in the success of long-range land use planning as well as the functioning and safety of transportation facilities, in addition to numerous secondary indirect benefits. The process for bridging this gap involves the interdisciplinary technical expertise, improved communication, cooperation of all parties involved in the transportation planning process, and the application of information technology to identify problem areas as early as possible and suggest the best possible solutions.

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