Access Management

Access Management: A Key to Safety and Mobility

Access management can be defined as the process or development of a program intended to ensure that the major arterials, intersections and freeway systems serving a community or region will operate safely and efficiently while adequately meeting the access needs of the abutting land uses along the roadway. The use of access management techniques is designed to increase roadway capacity, manage congestion and reduce crashes.

Through the years, extensive investment for public roadway infrastructure has been made. This has largely involved public funds, but private monies also have contributed to rebuilding and enhancing the street system. During the past 30 years or more, the ability to increase roadway capacity has been increasingly difficult due to both economic and environmental constraints. Areas that do not practice effective access management face more rapid deterioration of the quality of traffic flow than those areas with a well-thought out access management policy in place.

The purpose of this briefing sheet is to describe the traffic engineering and design considerations in relation to the use of access management techniques to increase safety and reduce crashes.

The lack of an access management plan or policy will ultimately result in a number of negative consequences including:

- Reduction in overall safety reflected by the increase in crashes;
- Greater number of conflicts and potential hazards between vehicular bicycle and pedestrian movements;
- Diversion of through traffic into abutting neighborhoods in attempt to bypass added congestion;
- Increased congestion with slower travel speeds and delays to arterial traffic; and
- Non-transportation effects such as increase in strip commercial development, less pleasing visual settings and ultimately, a poor image for the businesses along the corridor.

Traffic Engineering and Design Considerations to Enhance Access Management

Some of the most significant areas to address in relation to access management are related to *traffic signal spacing, the number of driveways* and the *characteristics of an intersection*.

Traffic Signal Spacing

Figure 1 shows comparative accident rates for a given signal density and number of unsignalized access points per mile. The graph clearly shows that a greater number of access points and signals per mile translate into increases in crash rates. As an example, if the number of access points are held constant at less

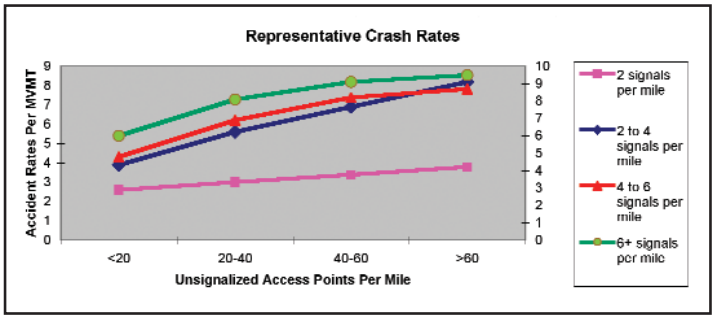

Figure 1

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than 20 unsignalized access points per mile, and the number of signals per mile are categorized as less than two, as compared to two to four signals per mile, there is a 50 percent increase in the crash rate (from 2.6 million vehicle miles of travel (mvmt) to 3.9 mvmt.

Table 1 considers the number of signals per mile in comparison to crash data compiled from seven states. As shown, there is an increase in the crash rate of 158 percent (from 3.53 crashes per mvmt to 9.11 crashes per mvmt) when under conditions of less than two signals per mile as compared to six or more signals per mile.

Table 1

Signal Per Mile	Crashes Per MVMT
Under 2	3.53
2 to 4	6.89
4 to 6	7.49
6+	9.11

Intersection Spacing

As the number of intersections per mile increases, the opportunity for crashes increase. The existence of too many intersections per mile also increases delay and congestion. Table 2 provides a few rules of thumb for intersection spacing:

Table 2

Intersection Spacing/ Roadway Types	Suggested Spacing
Arterial (major roadway) to arterial (intersecting minor roadway)	≥ 1 mile
Arterial (major roadway) to collector (intersecting minor roadway)	≥ 0.5 mile
Intersection of local roads with arterials is not recommended; However if required	500 to 660 feet
Rural areas, intersections between public roads	0.5 mile; preferred 1 mile

The Iowa Department of Transportation conducted an access management research project and collected data in seven communities in conjunction with the development of an access management awareness program. Figure 2 shows the number and type of accidents per year (and percentage reduction) prior to and after implementation of a series of access management techniques. As shown, total accidents were reduced by approximately 39 percent; and rear-end and left-turn accidents were reduced by 41 and 42 percent, respectively.

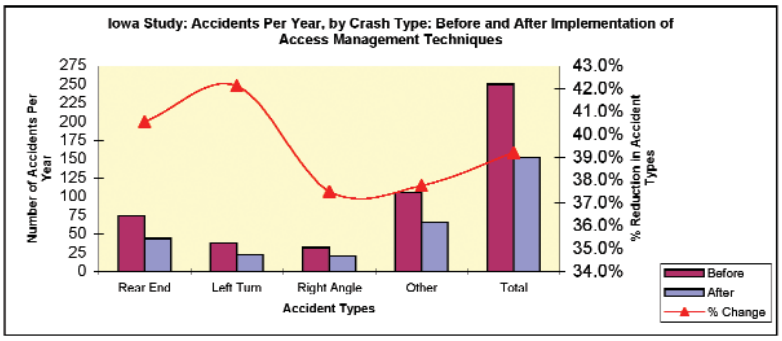

Figure 2

Functional Areas of Intersections

The functional area of an intersection is that area beyond the physical intersection of two roadways that comprises decision and maneuvering distance, plus any required vehicle storage length. The functional area includes the length of road upstream from an oncoming intersection needed by motorists to perceive the intersection and begin maneuvers to negotiate it.

The upstream area consists of distance for travel during a perception-reaction time, travel for maneuvering and deceleration and queue storage. The functional area includes the length of road downstream from the intersection needed to reduce conflicts between through traffic and vehicles entering and exiting a property.

Driveways should not be located within the functional area of an intersection.

Driveways located within the functional area may create too many conflict points within too small an area for motorists to safety negotiate.

The integrity of functional areas of intersections can be protected through corner clearance, driveway spacing and intersection spacing requirements. Intersections should be spaced far enough apart so that functional areas do not overlap.

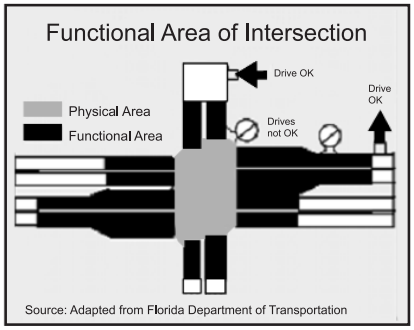

Figure 3

Access Management Tools and Techniques

There are a number of other tools and techniques available to consider for use as part of an access management plan. They include both physical design techniques as well as policy related addressing land development and roadway design standards. Examples of common and highly effective techniques are:

- Consolidate and minimize left turn exits from driveways;
- Use a two-way center left-turn lane;
- Use of raised center median;
- Encourage shared driveways for adjacent land parcels/developments;
- Create service roads for direct land access parallel to major arterial; and
- Provision of adequately designed turn lanes.

Resources

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