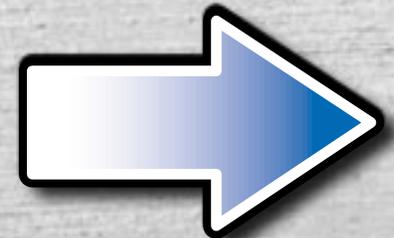


ACCESS MANAGEMENT Handbook



*Balancing the Demands on
Our Roadways*



ACCESS MANAGEMENT HANDBOOK

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Purpose of This Handbook

Access management is defined as the control of driveways and intersections to maintain safety at a roadway's full traffic carrying capacity. Implementing an access management program based on the principles described in this handbook will encourage smooth and safe traffic flow on a community's roadways and will help communities avoid some of the traffic problems caused by uncontrolled strip development.

This handbook emphasizes the importance of including access management principles in a community's comprehensive development plan. However, communities without a comprehensive plan or whose plan does not address access management can still use the guidelines suggested in this handbook to develop a successful access management program.

This book will be especially helpful for city and county officials who want to include access management standards in local ordinances such as zoning, subdivision, or site plan review ordinances. The appendices include the Iowa Primary Road Access Management Policy adopted by the Iowa Department of Transportation (DOT), and example ordinances that can be implemented at the city and county levels.

While this handbook is designed specifically for Iowa, officials from other states may find the general definitions and principles helpful. Of course, the code of other states may be different from Iowa's, and therefore portions of this handbook may not be pertinent to officials in those states.

How to Use This Handbook

Chapter 1 defines the terms used throughout this handbook.

Chapter 2 addresses current problems, including traffic congestion resulting from unplanned roadside development along arterial roadways, and the need for collaboration between state and local governments.

Overview

Chapter 3 explains the basic principles and benefits of access management. Benefits include preserving highway capacity, reducing crashes, and enhancing economic vitality.

Chapter 4 describes and illustrates types of access management strategies that are best suited for the local level, including strategies to limit driveway numbers and remove slow turning vehicles from the arterial. This chapter also suggests access management strategies related to other issues like transit and pedestrians.

Chapter 5 shows how a comprehensive plan plays an important role in developing and implementing a local access management program. This chapter also discusses some of the unique issues involved with retrofitting existing corridors.

Chapter 6 discusses how to involve the public in support of a community's access management project.

Appendix A provides an example access management ordinance that can be adopted by a city in Iowa. **Appendix B** provides an example access management ordinance that can be adopted by a county in Iowa. **Appendix C** contains the text of Chapter 306A of the Code of Iowa, which grants the authority to the Iowa Department of Transportation (Iowa DOT) to control access on the state's highways, and The Iowa Primary Road Access Management Policy, which implements Chapter 306A through rules and regulations promulgated by the Iowa DOT.

The **Endnotes** section lists sources of tables, charts, graphics, and other information used throughout the text. The **References** section lists additional readings that users of this handbook may find helpful.

Introduction

The following glossary will provide a common vocabulary for engineers, planners, city council members, county boards of supervisors, business owners, and the general public as they discuss access management principles and projects.

Glossary of Terms Used in this Handbook

Acceleration Lane – A speed change *lane* that enables a vehicle entering a roadway to increase its speed to a rate at which it can safely merge with through traffic.

Access – The ability to enter or leave a public street from or at an adjacent driveway or another public street.

Access Management – The control of *driveways* and *intersections* to maintain safety at a roadway's full traffic carrying capacity.

Access Management Program – The sum of all actions taken by a governing council, board, or agency to maintain the safety and traffic carrying capacity of its roadways. These actions may include enacting ordinances that control driveway location and design. Adopting and implementing a comprehensive planning and zoning ordinance to guide the overall pattern of growth also can be a part of an *access management program* if it is aimed at avoiding or limiting *strip development*.

Annual Average Daily Traffic (AADT) – The annual average two-way daily traffic volume. It represents the total annual traffic on a road per year, divided by 365.

Arterial – A highway intended primarily for through traffic and where access is carefully controlled.

Backage Road – A *local street* or road running parallel to an *arterial* for service to abutting properties and for controlling *access* to the *arterial* which provides land *access* to the rear lot line of the property. *Arterial frontage* becomes the rear lot and buildings front on the *backage road*. See also *service roads* and *frontage roads*).

Collector Street – Roads intended to move traffic from local roads to secondary arterials.

Compact Area – A geographic area encompassing roadways along which structures are spaced less than 200 feet apart for a distance of ¼ mile or more.

1-Glossary

Conflict – A traffic-related event that causes evasive action by a driver to avoid collision with another vehicle.

Conflict Point– Any point where the paths of two through or turning vehicles diverge, merge, or cross.

Congestion – See *traffic congestion*.

Controlled Access Highways – Highways that serve through traffic, have very few *access* points, and may prohibit direct *access* from the highway to abutting land.

Corner Clearance – The minimum dimension, measured parallel to a highway, between the curb, pavement or shoulder lines of an intersecting highway and the nearest edge of a driveway.

Corner Lot – A single lot with *frontage* on a road and an intersecting road.

Cross Access – A service drive providing vehicular *access* between two or more continuous sites so the driver need not enter the public street system.

Cul-de-sac – A dead-end road with a circular or T-shaped turnaround at the end, usually built to serve a small *subdivision*.

Deceleration Lane – A speed-change *lane* that enables a vehicle to leave the through traffic *lane* at a speed equal to or slightly less than the speed of traffic in the through *lane*, then to decelerate to a stop or make a slow speed turn.

Driveway – An entrance used by vehicular traffic to *access* property abutting a highway. As used in this handbook, the term includes private residential *driveways* as well as commercial and other non-residential *driveways*.

Low Volume Driveways: *Driveways* with a traffic volume of less than 500 *vehicle trips* per day and less than 50 *vehicle trips* per peak hour.

Medium Volume Driveways: *Driveways* with a traffic volume of 500 to less than 1500 *vehicles* trips per day and 50 to less than 150 *vehicle trips* per peak hour.

High Volume Driveways: *Driveways with a traffic volume of 1500 or more vehicle trips per day and 150 or more vehicle trips per peak hour.*

Design Hour Volume – The hourly traffic volume used to evaluate or design a highway or *driveway*.

Driveway Width – The narrowest width of the *driveway*, measured parallel to the highway *right-of-way*.

Easement – A grant of one or more property rights by a property owner to or for use by the public, or another person or entity.

Frontage – The width of a single lot, measured parallel to the *right-of-way*.

Frontage Road – A public or private drive that generally parallels a public street between the *right-of-way* and the front building setback time. The *frontage road* provides *access* to private properties while separating them from the *arterial* street (see also *service roads* and *backage roads*).

Functional Area (Intersection) – That area beyond the physical *intersection* of two controlled *access* facilities that comprises decision and maneuver distance, plus any required vehicle *storage length*, and is protected through *corner clearance* standards and *driveway* connection spacing standards.

Functional Classification – A system used to group public roadways into classes according to their purpose in moving vehicles and providing *access*; it includes design and operational standards.

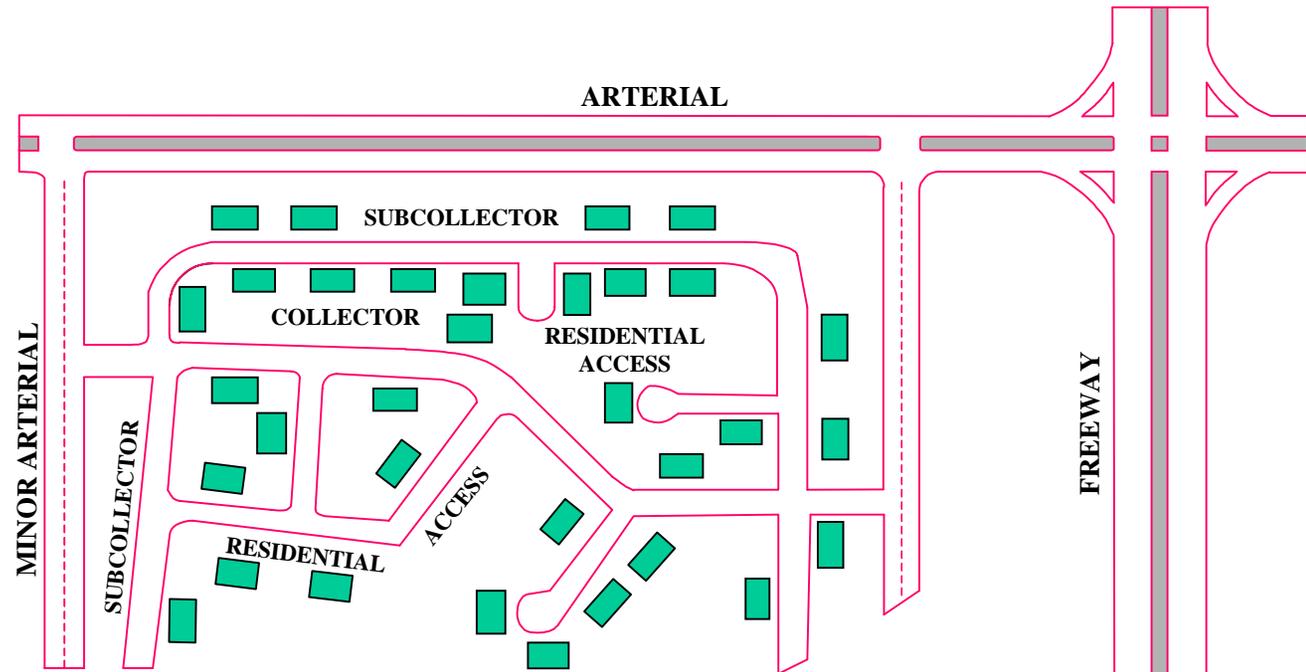
Functional Integrity – The principle that the highest speed and highest capacity roads should be reserved for longer distance and higher speed travel.

Highway Capacity – The maximum number of vehicles that a highway can handle during a specific amount of time at a given *level of service*.

Highway System – All public highways and roads in Iowa. These include *controlled access highways*, *arterials*, *collector streets* and *local streets* (Figure 1).

1-Glossary

Figure 1—The highway system



Source: Adapted from Endnote (1)

Joint Access (or Shared Access) – A *driveway* connecting two or more continuous sites to the public street system.

Lane – The portion of a roadway for the movement of a single line of vehicles, not including the gutter or roadway shoulder.

Level of Service – The description of traffic conditions along a given roadway or at a particular *intersection*. The *level of service* ranges from “A,” which is the best, to “F,” which is the worst. It reflects factors such as speed, travel time, freedom to maneuver, traffic interruptions, and delay.

Local Street – A road whose primary purpose is to provide direct access to abutting properties and to roads of higher functional classification.

Peak Hour Traffic – The highest number of vehicles passing over a section of a *lane* or roadway during any 60 consecutive minutes. Typically, there is a peak hour condition in the a.m. and a peak hour condition in the p.m. for which a roadway or *intersection* is analyzed for capacity and *level of service*.

Right-of-Way – Land reserved, used, or slated for use for a highway, street, alley, walkway, drainage facility, or other public purpose.

Service Road (Frontage Road, Backage Road) – A public or private street or road, auxiliary to and normally located parallel to a controlled *access* facility, that maintains local road continuity and provides *access* to parcels adjacent to the controlled *access* facility.

Shared Driveway – A single *driveway* serving two or more lots. A shared *driveway* may cross a lot line or be on the lot line, and the owners may have an *easement* for the shared use.

Side Friction – Driver delays and *conflicts* caused by vehicles entering and exiting *driveways*.

Storage Length – Additional *lane* footage added to a turning *lane* to hold the maximum number of vehicles likely during a peak period so as not to interfere with through travel *lanes*.

Strip Development – A linear pattern of roadside development. It commonly includes residential and/or commercial development. Typically, no *frontage roads* are available to reduce the number of driveways that intersect with the *arterials*.

Subdivision – Any tract of land that is developed by division into a lot or lots along an existing or proposed street, highway, *easement*, or *right-of-way*.

1-Glossary

Thoroughfare Plan Map – A map that depicts all roadways contained on the long range traffic circulation map and identifies the *right-of-way* widths for each roadway. The *thoroughfare plan map* is the official listing of *rights-of-way* to be reserved.

Traffic Congestion – A condition resulting from more vehicles trying to use a given road during a specific period of time than the road can handle with what are considered acceptable levels of delay or inconvenience.

Traffic Impact Study – A report initiated in response to a proposed development that compares the anticipated roadway conditions with and without the development. The report may include an analysis of mitigation measures.

Trip Generation – The estimated volume of traffic going to and from a particular location.

Turn Radius – The radius of an arc that approximates the turning path of a vehicle.

Uncontrolled Access – The unlimited number, spacing, and/or unstandardized design of *driveways* onto a street or road.

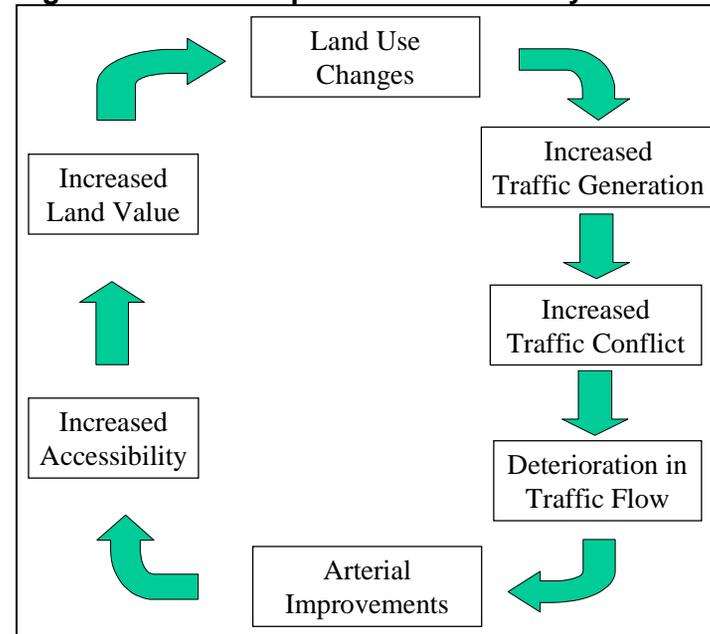
Vehicle Trip – The vehicle moving from an origin point to a destination point.

Volume Warrants – The conditions under which traffic management techniques, such as a left-turn or a right-turn *lane*, are justified. For example, the need for a left-turn *lane* will vary according to the volumes of advancing and opposing traffic, and the percentages of traffic turning left.

Uncontrolled Development

Iowa has invested enormous amounts of resources into its arterials. These highways are vital links between communities and serve as essential corridors for commerce, trade, tourism, and recreational travel. However, in an all too familiar pattern, residential and commercial growth has occurred along the arterials serving the state’s cities. This growth often creates a need for expensive highway improvements including additional travel lanes, bypasses, turning lanes, and intersection signalization (Figure 2).

Figure 2—The transportation land use cycle



Source: Adapted from Endnote (2)

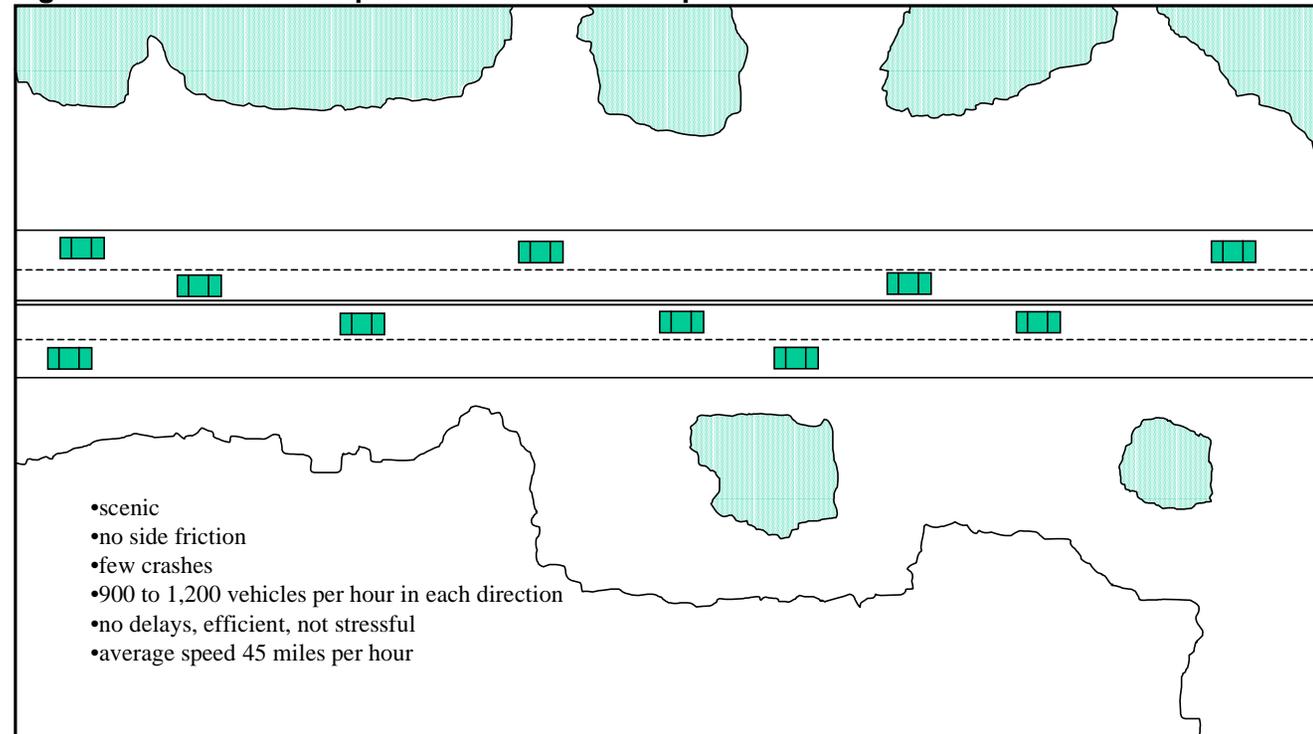
Unfortunately, few communities have enacted ordinances to control the rate and quality of this arterial roadside development, and taxpayers must bear the costs associated with strip development, traffic congestion, safety problems, and expensive remedial highway improvements.

2-Current Problems

Why Does It Happen?

Strip development occurs so slowly that it is seldom viewed as a crisis until traffic problems become severe. Development therefore is often allowed to continue in a haphazard manner until the problems become unbearable (Figures 3–5).

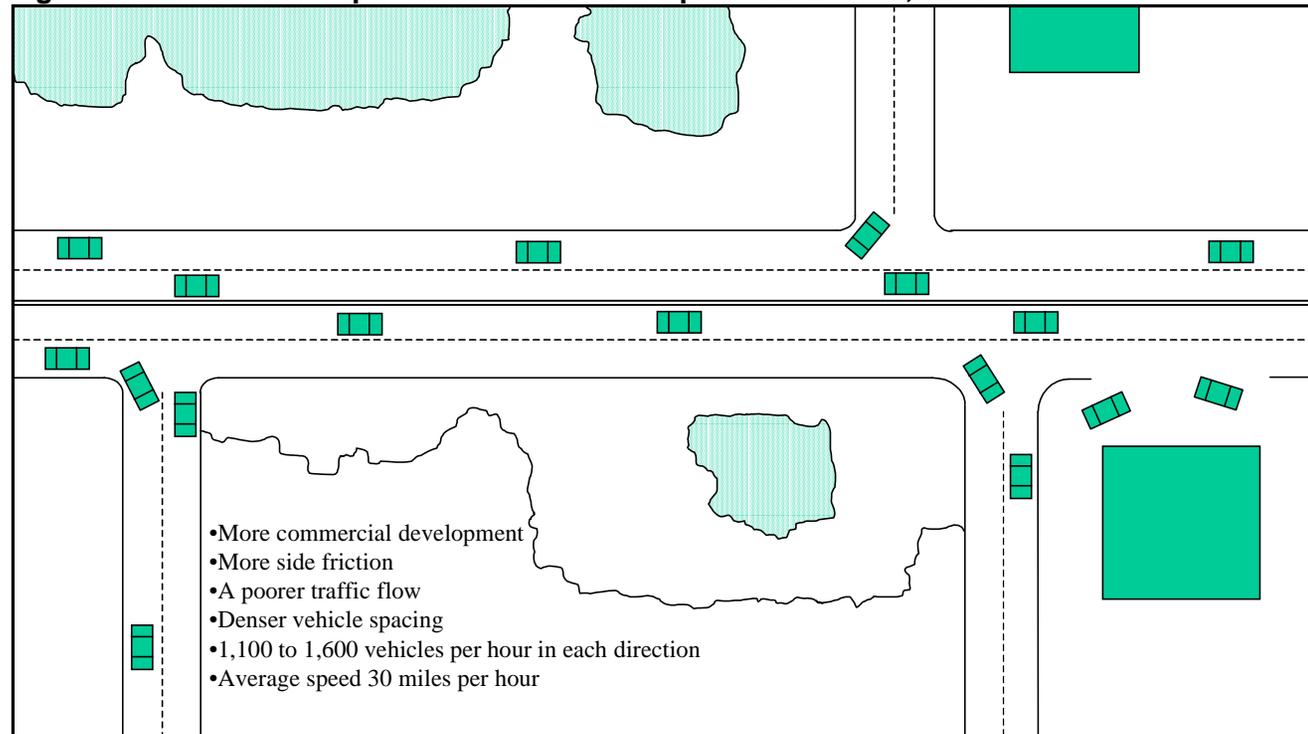
Figure 3—Cumulative impact of roadside development over time



Source: Adapted from Endnote (3)

Arterials that carry large volumes of traffic are attractive locations for strip development. Residential and commercial developments locate along the arterial over time until strip development becomes the predominant land use pattern. The ability of the arterial to move traffic then becomes seriously compromised, resulting in increased traffic congestion and reduced safety. Ironically, it is often the small and medium-scale businesses that cumulatively create the worst problems.

Figure 4—Cumulative impact of roadside development over time, continued

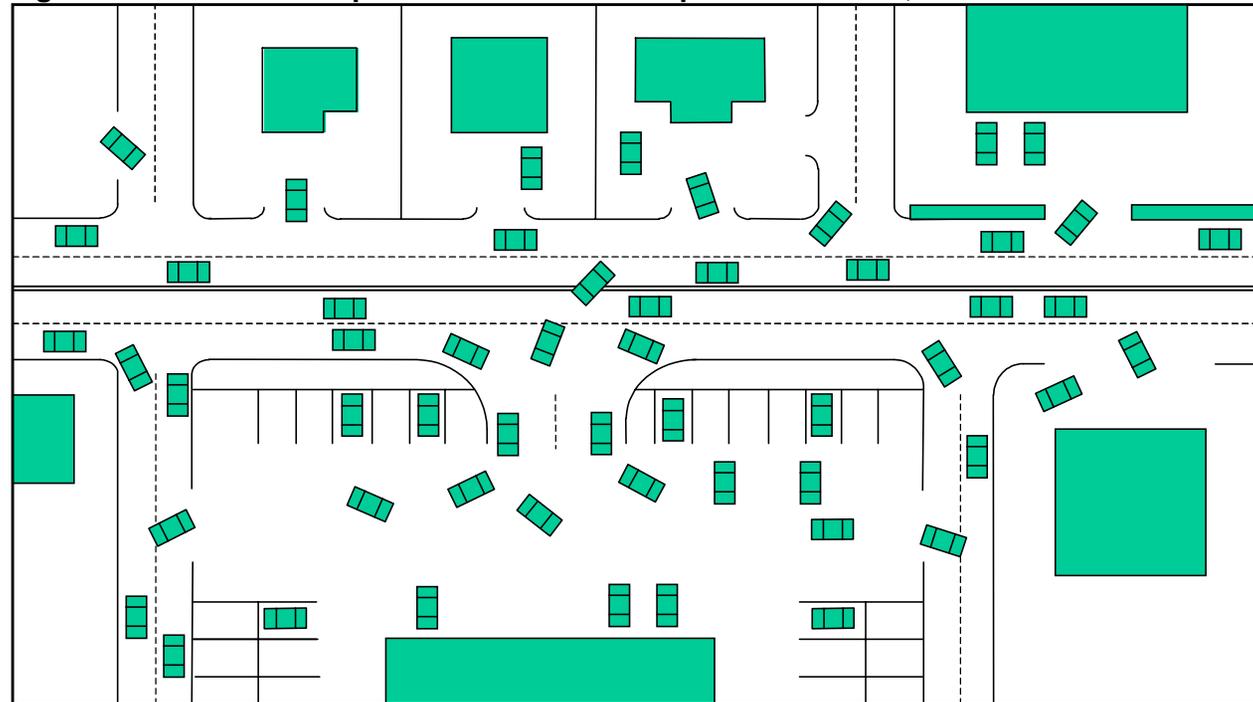


Source: Adapted from Endnote (3)

2-Current Problems

Inefficient zoning and street layout forces a business to connect driveway access to the arterial. If side streets had been developed correctly, driveway access could have been rerouted to these streets.

Figure 5—Cumulative impact of roadside development over time, continued



- Too much side friction
- Excessive congestion
- More crashes

- Through traffic slowed
- Too many driveways and intersections
- Inadequate spacing between driveways and intersections
- Too many conflict points and left turns

- Highly stressful
- 1,300 to 2,000 vehicles per hour in each direction
- Average speed 20 miles per hour.

Source: Adapted from Endnote (3)

State and Local Collaboration

The Iowa Department of Transportation (DOT) has the right to restrict access on state roads, but when these roads pass through cities, both the DOT and the municipality must agree to allow access to a business or residence. The level of restriction that the DOT can exert over an arterial depends on the level of access control rights that have been purchased. Every parcel of land is required by law to have reasonable access to it, and it is not always possible to limit driveways to a set spacing throughout the length of an arterial. In many cases, cities have zoned a section of land in such a way that many small parcels must be granted access onto the arterial or else they would have no access at all.

Additionally, growth occurs not only on state roads but also on county roads just outside of cities and on city streets. The state cannot solve all of these development problems by itself.

Solving the Problem

City and county governments have the potential to better control all land development along an arterial. If it is a state controlled roadway, the city and the state jointly control the roadway and access to it. In Iowa, reasonable access does not mean that access has to be provided directly off a main street or highway. In some cases, reasonable access may be provided off side streets or roads. Local governments therefore can prepare and adopt comprehensive planning and zoning ordinances to guide the overall development patterns and even prohibit strip development. Regardless of the existence of an effective comprehensive plan, cities can also enact access management controls to regulate the placement and design of driveways.

Marshalltown Case Study: Poor Access Control—Old U.S. Highway 30

The city of Marshalltown, population 25,000, is located in central Iowa at the intersection of U.S. Highway 30 and Iowa Highway 14 about 40 miles northeast of Des Moines. U.S. Highway 30, which travels through Marshalltown in an east-west direction, serves intrastate traffic in central Iowa. This highway provides an example of how poor management of access can lead to great expense later on.

Originally, U.S. Highway 30 bisected the center of the city. In 1954, the state constructed a bypass to relieve the traffic congestion caused by local development. This bypass rerouted U.S. Highway 30 around the south side of the city. However, access was not sufficiently managed following the

2-Current Problems

construction. Almost all adjacent properties were allowed separate driveway access to the bypass, and by the mid-1990s, uncontrolled access had again begun to hinder traffic flows and adversely impact safety (Figure 6).

Figure 6—Original U.S. 30 bypass



In an effort to improve the highway's safety and service, the Iowa DOT determined the most viable solution would be the construction of a second bypass south of the city. A second bypass was less costly than retrofitting the original bypass, which would have involved purchasing additional right-of-way, relocating businesses, and constructing service roads for proper access. The second bypass

opened in 1996. It is a four-lane facility with fully controlled access at grade-separated interchanges (Figure 7).

Figure 7—Second U.S. 30 bypass



Marshalltown's experience demonstrates how uncontrolled development can hurt traffic operations. It also shows the high cost of not properly managing access along a major highway.

What is Access Management?

The Federal Highway Administration’s official definition of access management is “the process that provides access to land development while simultaneously preserving the flow of traffic on the surrounding system in terms of safety, capacity, and speed.” In practical terms, it means managing the number of driveways that a vehicle may encounter without hampering reasonable access to a property and removing slower, turning vehicles from the arterial as efficiently as possible.

- Access management deals with the traffic problems caused by unmanaged development before they occur.
- Access management addresses how land is accessed along arterials.
- Access management focuses on mitigating traffic problems arising from development and increased traffic volume attempting to utilize these developments.
- Access management calls upon local planning and zoning to address overall patterns of growth and the aesthetic issues arising from development. More information on local planning and comprehensive plans is provided in Chapter 5.

What is an Arterial?

An arterial is a highway or major street whose primary purpose is to provide safe and efficient long-distance travel (Figure 8). Providing local access is a secondary function. In Iowa, most numbered state and federal highways and major urban streets are arterials. A city may choose to enact an access management program for local roads and streets as well as arterials.

3-Defining Access Management

Figure 8—North Ankeny Boulevard

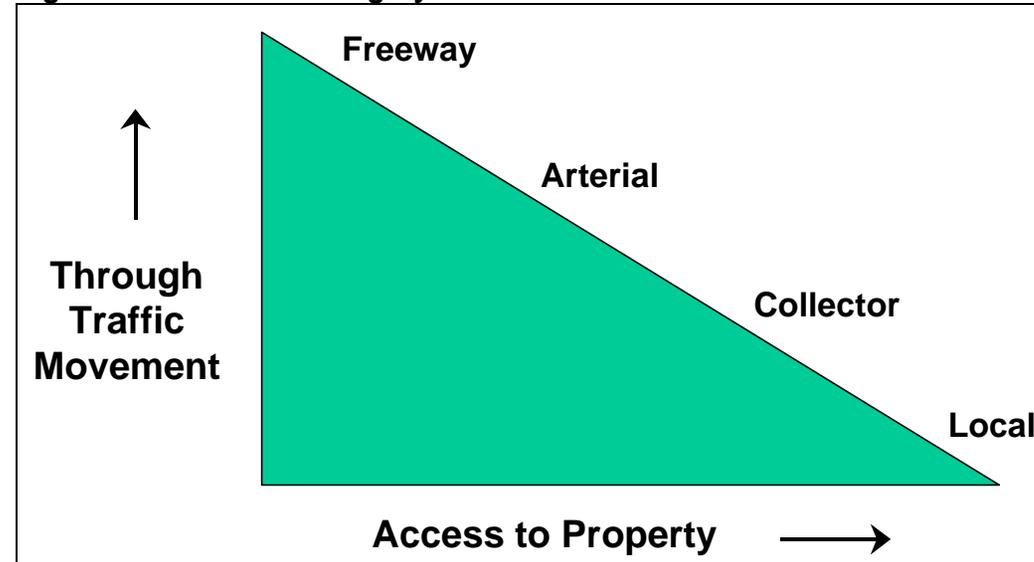


Typically, almost all roadways over which a community has planning and maintenance jurisdiction will fall into one of three classifications: arterial streets, collector streets, or local streets. The difference between the classifications depends on the trade-off between providing mobility to through traffic with higher speeds and traffic volumes and the level of land access that is permitted.

The functional integrity of the street/highway system is the effectiveness or reliability with which it provides personal mobility, freight delivery, cargo transport, and access to land use activities (Figure 9). The preservation of the functional integrity of the highway system is needed to assure that the necessary capabilities of various highway classes are protected so they can accommodate the

transportation needs of society. A well developed street or highway system can provide for the necessary mobility, as well as the desired access to property.

Figure 9—Functional integrity



The priority on arterial streets is to provide mobility to through traffic, while the priority on local streets is to provide access. Collector streets fall in between, with the mobility and access functions sharing the priority equally. To maintain the functional integrity of roadways, it is necessary to identify a “hierarchy” of roads (Table 1).

3-Defining Access Management

Table 1—Hierarchy of roads

Classification	-- Main Function --		-- Characteristics --			
	Traffic Movement	Land Access	Speed Limit (mph)	Minimum Intersection Spacing	Direct Land Access	
Freeway and Expressway	X		Inter-community travel	45 and greater	1 mile	None
Primary Arterial	X	Secondary function	Inter- and intra-community travel	35 to 55	1/2 mile	Limited: major traffic generators only
Secondary Arterial	X	Secondary function	Intra- and inter-community travel	30 to 45	1/4 mile	Restricted: some movements prohibited; number & spacing of driveways controlled
Collector	X	Secondary function	Collect & distribute traffic between local streets & arterials; should not extend across arterials	25 to 35	300 feet	Safety controls; some regulation of access
Local Street		X	Land access	20 to 25	300 feet	Safety controls only; unlimited access

Source: Adapted from Endnotes (4) and (5)

The arterial streets and highways are key to maintaining the utility of the highway systems with their primary responsibility to provide for mobility, capacity, reasonable speeds, and safety; they have limited responsibility to provide access. The design geometrics of each of these facility classes are matched to the functional requirements; that is, the speed, capacity, and operational characteristics.

General Principles of Local Access Management

The overall goal of local access management is to reduce traffic conflicts by

- limiting the number of conflict points that a vehicle may experience in its travel;
- separating conflict points as much as possible (if they cannot be completely eliminated); and
- removing slower turning vehicles that require access to adjacent sites from the through traffic lanes as efficiently as possible.

These three basic means of eliminating or separating conflicts can be achieved in many ways. Good land use planning, sensible regulation, and reasonable site planning guidelines can all help reduce congestion and conflict. These techniques are explored and explained in the following chapters.

Figure 10 illustrates how these concepts can be applied to a major arterial serving a developing area. Property access is restricted by a raised center median and provided at widely spaced intervals by left and right turn lanes. In addition, median openings are restricted at unsignalized intersections.

3-Defining Access Management

Figure 10—Example of excellent access control on an arterial highway



Source: Endnote (6)

Table 2 shows the number of conflicts points at the intersection of different types of roads.

Table 2—Conflict points for standard configurations

Principal Road	Minor Road	Conflict Points
two lanes	single driveway	9
two lanes	two lanes or opposing driveways	32
four lanes	single driveway	11
four lanes	two lanes or opposing driveways	40
four lanes	four lanes	52

Source: Endnote (7)

Figures 11 through 14 illustrate these concepts.

Figure 11—Reduction in traffic conflict points from conversion of a driveway on a four-lane undivided roadway to a driveway on a four-lane roadway with a raised median and a restricted left turn lane

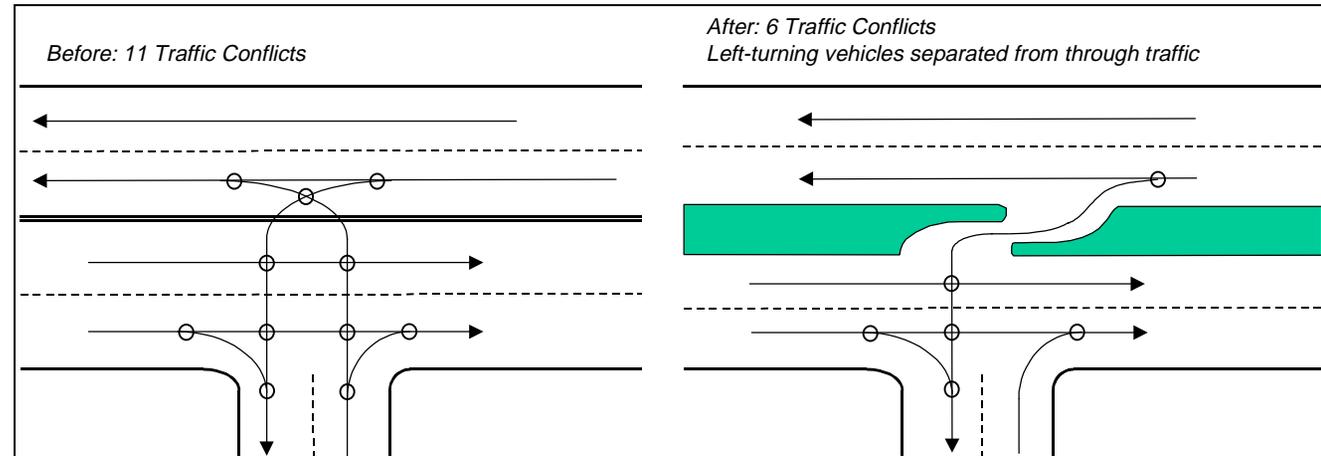
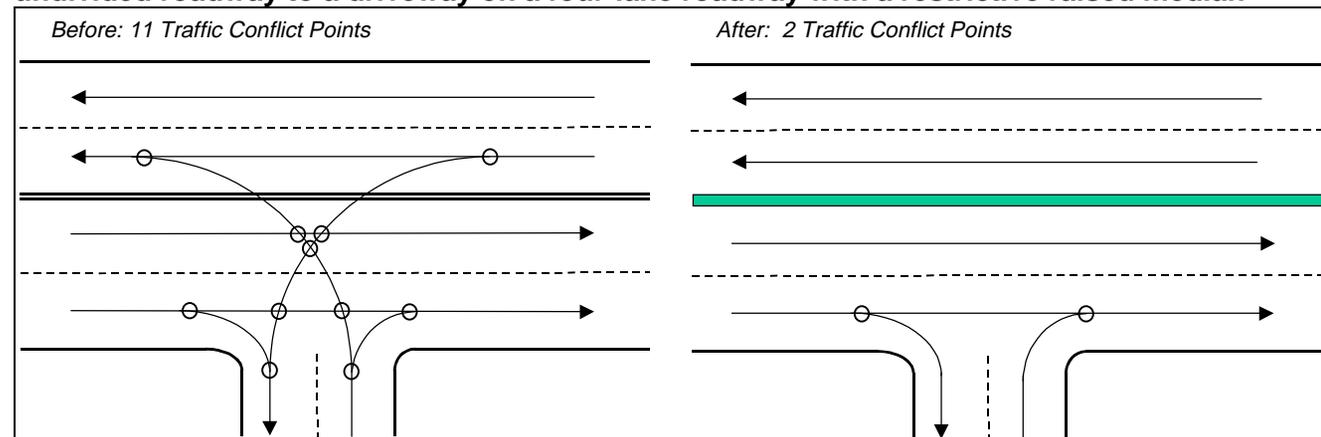


Figure 12—Reduction in traffic conflict points from conversion of a driveway on a four-lane undivided roadway to a driveway on a four-lane roadway with a restrictive raised median



3-Defining Access Management

Figure 13—Reduction in traffic conflict points from driveway consolidation of two closely spaced driveways on a four-lane undivided roadway

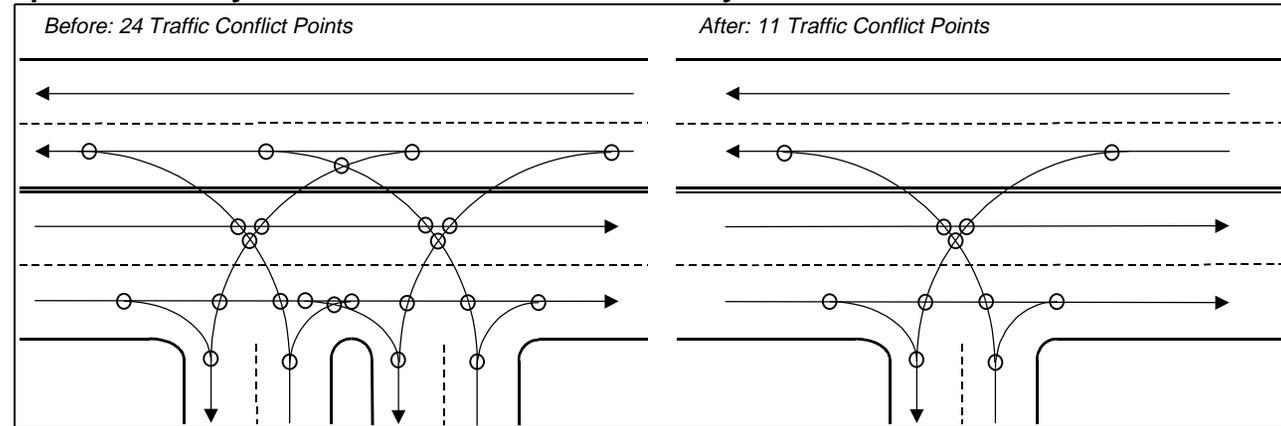
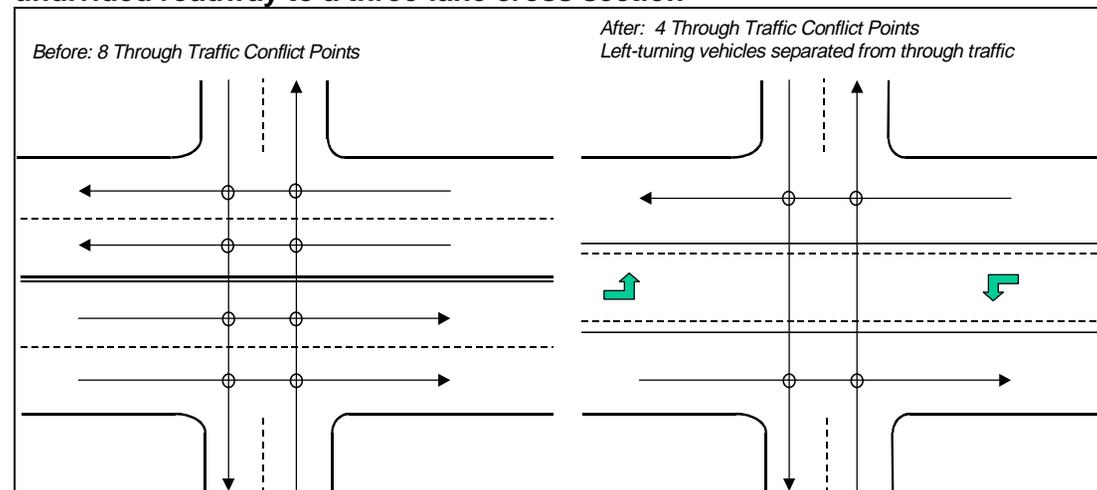


Figure 14—Reduction in through traffic conflict points from conversion of a four-lane undivided roadway to a three-lane cross section



Source: Endnote (8)

Why is Access Management Important?

An effective, local access management program can play an important role in preserving highway capacity, reducing crashes, and avoiding or minimizing costly remedial roadway improvements. The traveling public will benefit from faster and safer travel. Businesses will benefit from increased business vitality along a well managed corridor. Taxpayers will benefit from more efficient use of existing facilities. Public agencies will benefit from the relatively low cost of access management and can use their resources for other needs.

To Preserve Highway Capacity

Each new driveway that is located on an arterial reduces the arterial's traffic carrying capacity. After several new driveways have been installed it often becomes clear that turning traffic has a negative impact on traffic speeds on the arterial. Studies indicate that average travel speeds during peak hours are considerably higher on well managed roads than on roads that are less well managed, even though the two types of roads carry approximately the same number of vehicles. In Iowa, a series of before and after studies of access management projects found that the level of service was raised one full level during the peak traffic hour at sites studied (Table 3).

Table 3—Improvement in peak hour traffic service levels

Project Location	Before Project	After Project
Ames	C	B
Ankeny	C/D	B
Clive	D	B/C
Des Moines	D	B/C
Fairfield	B	B
Mason City	B	B
Spencer	B	B

The capacity of any given arterial is limited, and it is uncertain given the current financial and political constraints exactly how many arterials will be widened or new arterials constructed in the foreseeable future. Most communities will therefore continue to be served by their current arterials.

3-Defining Access Management

Traffic volumes have increased over the past ten years on virtually all of the urban arterials in Iowa, and in areas surrounding these metropolitan areas. It is likely that they will continue to grow in the future. It therefore makes sense to enact minimum controls to preserve the traffic carrying capacity of these arterials as long as possible.

To Reduce Crashes

The most significant benefit associated with the access management projects studied in Iowa involves traffic safety. A typical access management project in Iowa may be expected to reduce annual crashes between 10 to 65 percent. Before and after studies of access management projects in Iowa found that average crashes per vehicle mile traveled was reduced by 40 percent (Figure 15). Personal injury crashes dropped almost 25 percent, and property-damage-only crashes were almost cut in half (Figure 16). No fatalities occurred on the corridors in question during the time frame of the study.

Figure 15—Crash reduction by city along access controlled corridors

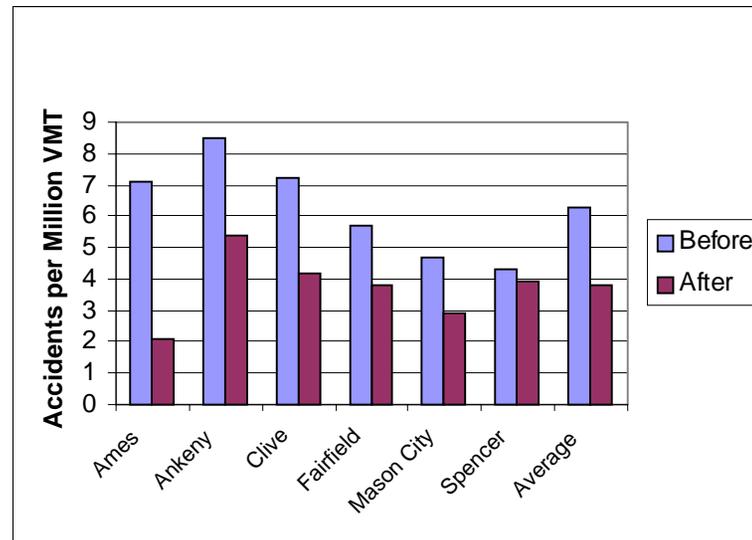
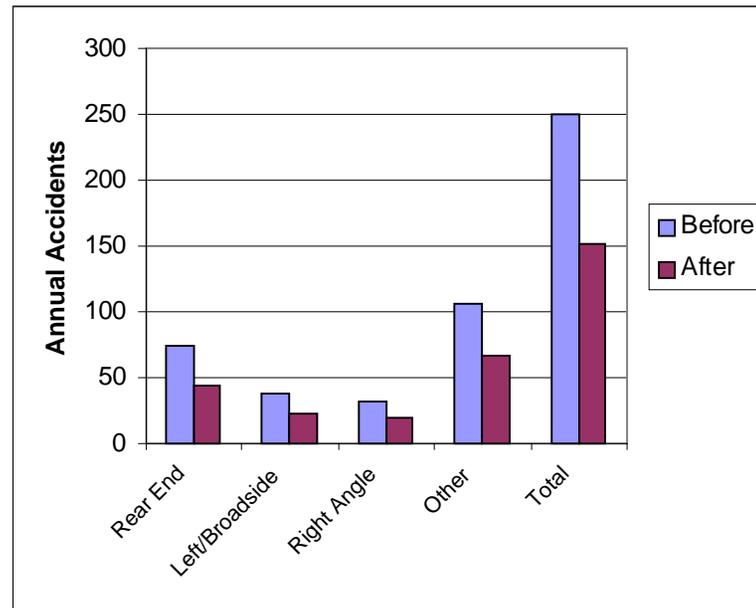


Figure 16—Crash reduction by crash type along access controlled corridors



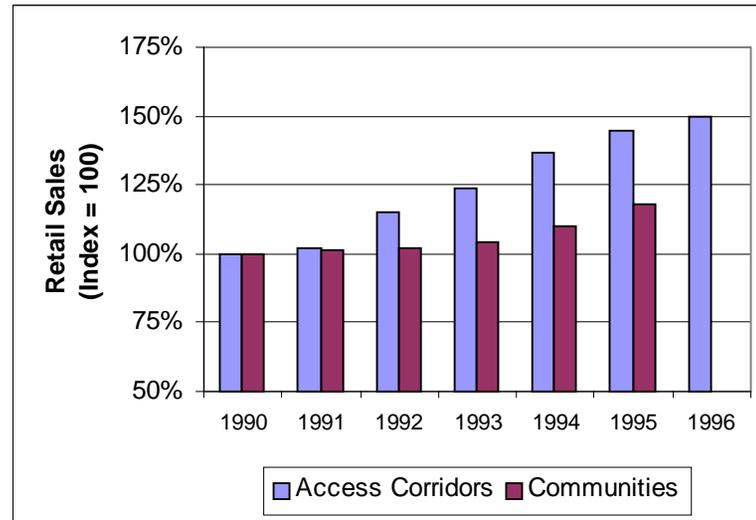
To Enhance the Community Environment and Economy

Business owners often express the concern that access management changes will have temporary or permanent impacts on their sales. They are particularly concerned about access management projects, such as medians, that significantly reduce turning opportunities for motorists. Analysis conducted for five business vitality case studies in Iowa indicates that businesses located within access management corridors generally performed better in terms of sales activities than their surrounding communities.

3-Defining Access Management

The accompanying chart contrasts sales within the access management corridors with the sales in their respective communities (Figure 17). Retail sales within the study corridors outpaced overall community sales activity throughout the period 1992 through 1995, and probably in 1996 as well. At a minimum, these results indicate that access management did not negatively impact business activity.

Figure 17—Retail sales activity along access controlled corridors



Figures adjusted to 1990 dollars. 1996 community sales report numbers not available at time of publishing, but relative trends expected to continue. Figures for Clive removed due to the city's unusually dramatic retail sales performance.

To Save Tax Dollars

An access management program can avoid, minimize, or delay costly road improvements. By preserving traffic carrying capacity and safety, such a program decreases the need for additional traffic lanes, turning lanes, median barriers, bypasses or other traffic control improvements. Poorly managed growth of business activity along an arterial often causes traffic delays and safety concerns. Road improvements satisfy traffic demands and improve traffic conditions, which, in turn, attracts more development. This development draws more traffic, and the cycle continues. By properly managing

3-Defining Access Management

the growth of a corridor, this cycle can be broken. The goal is not to prevent growth, but to rationally plan for it in advance to prevent or minimize congestion.

Everyone benefits by cooperative efforts to provide good access design. Not only is the public investment in the roadways protected by the application of access management techniques, but those using the abutting land and every driver using the roads where these techniques are used benefit as well. Property values remain stable or may increase along roadways that carry significant traffic volumes so long as the traffic can flow smoothly with a minimum of congestion and conflicting movement. Each driver is rewarded with lower vehicle operating costs due to smoother operations and less delay and with greater safety and comfort due to fewer conflicting traffic movements.

4-Developing an Access Management Program

Introduction

Development along an arterial often has a major impact on traffic safety and traffic carrying capacity. The following pages describe access management strategies that can be used to plan development on land abutting the community's arterials. Specific strategies are illustrated to show how they work and why they are important.

Encouraging wide spacings between driveways is the single most important step that a municipality can take to ensure safety and maintain the traffic carrying capacity of its arterials. When local officials review a development proposal that is adjacent to an arterial, a primary consideration should be for the safety of people traveling on the arterial, and a secondary consideration should be for people entering and leaving the proposed development.

The following strategies are aimed at encouraging safe conditions. They have the added benefit of preserving traffic carrying capacity. These concepts can be included in a local zoning, site plan review, traffic, or subdivision ordinance.

Access Management Strategies

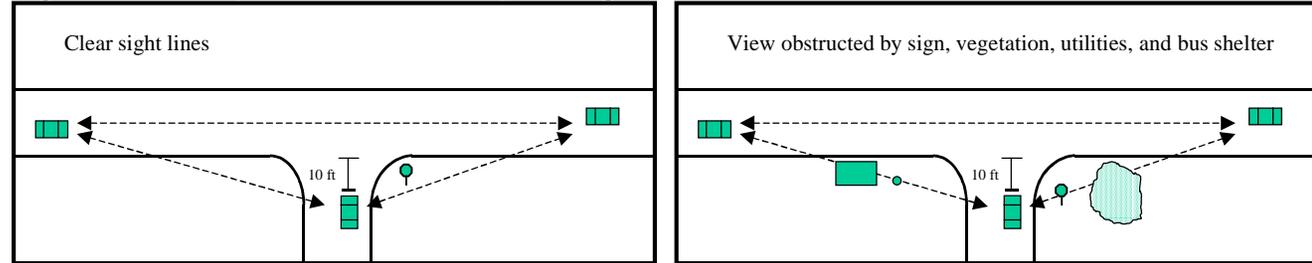
Suggested access management strategies fall into three categories: limiting driveway numbers, removing slower-moving traffic from the arterial, and general strategies.

Limiting Driveway Numbers

Sight Distance. One of the most important actions a community can take to assure that its arterials will be safe for motorists and pedestrians is to require a safe sight distance for residential and non-residential development. Sight distance is the length of highway visible to a driver. A safe sight distance is the distance needed by a driver on an arterial, or a driver exiting a driveway or street, to verify that the road is clear and to avoid conflicts with other vehicles (Figure 18). The Iowa DOT's sight distance policy (see Appendix C) is based upon posted daytime speed limits. Table 4 shows the required distances for access to Iowa's primary highways at speeds of 35 and 45 miles per hour.

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Figure 18—Adequate versus inadequate sight distances



Source: Adapted from Endnote (2)

Table 4—Iowa safe sight distance policy

Posted Speed Limit (mph)	Distance Required (feet)	
	Desirable	Minimum
35	395	265
45	560	395

Source: Iowa Primary Road Access Management Policy (Appendix C)

The safe sight distance for low and medium volume driveways should be large enough to allow vehicles on the arterial to slow down to a reasonable speed, but not stop, to avoid a collision with vehicles exiting a driveway. The safe sight distance for high volume driveways should be higher to allow a greater margin of safety.

A community should require that all new developments, including individual residences, subdivisions, and commercial developments meet a minimum sight distance requirement prior to the issuance of any permits or approvals (Figure 19). Ensuring that a safe driveway will be built is far easier during the development review process than after a project has been approved.

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Figure 19—Inadequate sight distance (viewed from a driveway)



Minimum Distance between Driveways. Maintaining a minimum distance between driveways along an arterial minimizes the number of access points that a driver must monitor. This simplifies the driving task and reduces the opportunities for conflicts and crashes. There are no hard and fast guidelines for driveway spacing. In practice, guidelines must reflect a balance between traffic and engineering conditions and needs, local development objectives, and existing land-use characteristics (such as lot sizes, land-use type, and frontage requirements). Spacing requirements should be based, among other factors, on speed limits, the classification of the roadway, or the amount of traffic generated by a development. The Transportation Research Board (TRB) has published general guidelines (Table 5) for unsignalized access spacing.

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Table 5—General guidelines for unsignalized access spacing

<i>Operating Speed</i>	
30 mph	100 to 200+ feet
45 mph	300 to 550+ feet
<i>Type of Facility</i>	
Major Arterials	300 to 500 feet
Minor Arterials	100 to 300 feet
Collectors	100 to 200 feet

Source: Adapted from Endnote (9)

Shorter access spacings can be permitted on roadways having a raised center median and on lower classification roadways. Longer spacings are desirable on roadways in rural areas where speeds are higher. These guidelines can be used for both residential and non-residential development. Consideration should be given to establishing a frontage requirement that is consistent with the driveway spacing guideline (Figures 20–22).

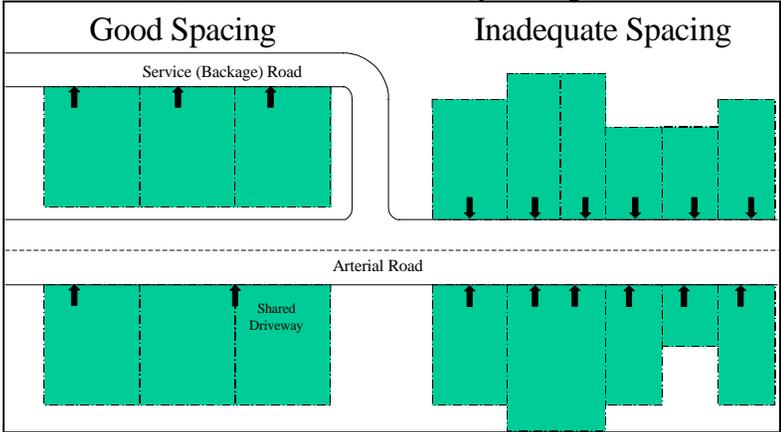
4-Developing an Access Management Program

Figure 20—Driveway spacing guidelines: Adopt minimum spacing requirements for driveways, and reinforce with minimum lot frontage and joint access requirements



Source: Adapted from Endnote (10)

Figure 21—Good spacing, with widely spaced driveways and deep lots with space for a service road, buffer and off-street parking, versus inadequate spacing



Source: Adapted from Endnote (3)

4-Developing an Access Management Program

Figure 22—Inadequate driveway spacing



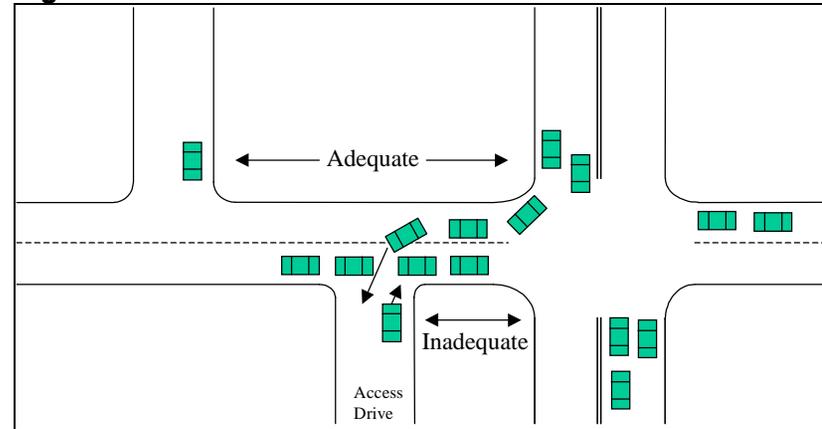
Maximum Number of Driveways Per Lot. Every driveway or intersecting street along an arterial has the potential to reduce the ability of the arterial to move traffic. While it is important to allow access to property, a municipality can limit the number of driveways permitted on any lot. Regulating the maximum number of driveways per property frontage limits the number of conflict points and provides drivers more time and distance to execute their maneuvers.

Corner Clearances. Establishing a minimum distance on an arterial between a driveway and an intersection can decrease the likelihood of crashes and minimize the interruptions to the flow of traffic. Inadequate clearance between driveways and intersections creates many conflict points within too small an area (Figure 23). Ideally, corner clearances on major roadways should be the same as driveway spacing requirements.

4-Developing an Access Management Program

When this cannot be achieved due to a lack of frontage, the upstream corner clearance should be longer than the longest expected queue at the adjacent intersection.

Figure 23—Corner clearance



Source: Adapted from Endnote (11)

Corner clearance guidelines preserve good traffic operations at intersections, as well as the safety and convenience of access to corner properties. Factors affecting safe corner clearances include the posted speed limit, whether the driveway is “upstream” or “downstream” from the intersection, and whether or not the intersection is signalized.

Figure 24 depicts one of the top 100 crash sites in Iowa. Inadequate access control is a contributing factor to many of the crashes.

4-Developing an Access Management Program

Figure 24—Inadequate corner clearance: safety and operational concern



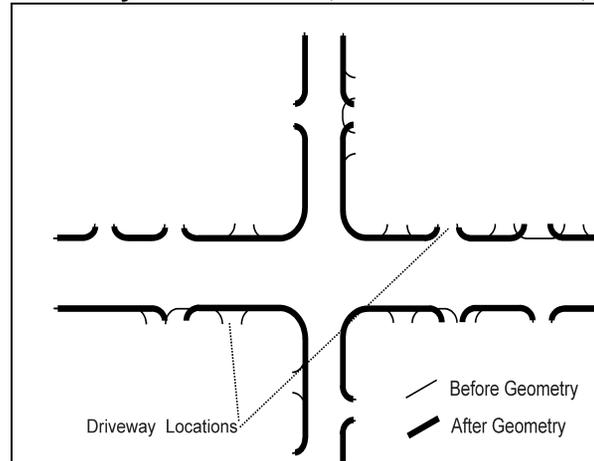
Communities should zone for higher volume uses, such as neighborhood convenience centers and grocery stores, near intersections of through streets. They can require corner lots to be larger to accommodate such uses and establish a minimum corner clearance for driveway connections at intersections and corners (Figures 25–26).

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Figure 25—Good corner clearance and large lot to accommodate high volume use (traffic signal indicates location of intersection)



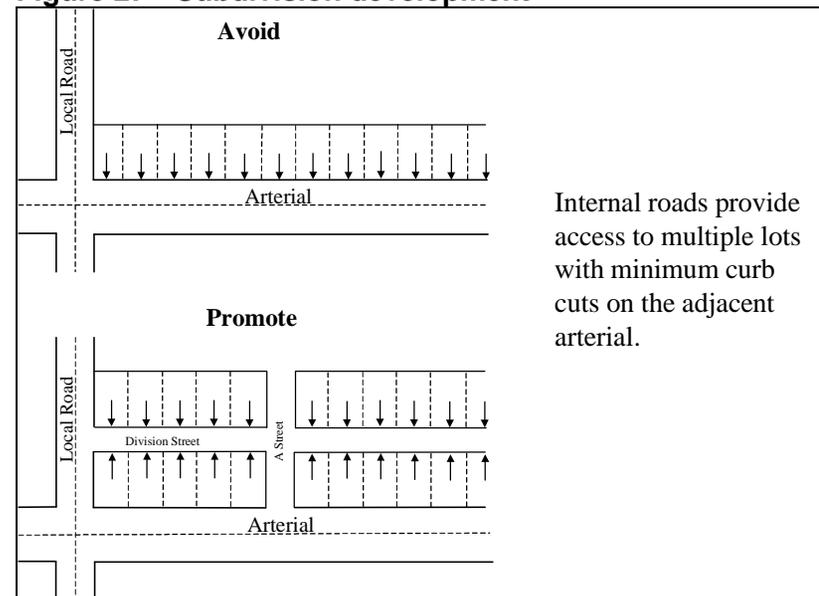
Figure 26—Driveway treatments: an example access management project in which some driveways were closed, others combined, and others cleared away from corners



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Access to Service or Minor Road—Residential Development. A row of residential driveways along an arterial can reduce its traffic carrying capacity and lower the safe speed. Although it might be easier and cheaper for a land developer to subdivide the frontage rather than construct interior roads, the public loses when the result is unsafe conditions, congestion, lower speed limits, and eventually a need for costly road improvements (Figures 27–28).

Figure 27—Subdivision development



4-Developing an Access Management Program

Figure 28—Internal access roads



It is better to construct interior roads that provide access to lots. This reduces the number of access points and preserves the capacity of the arterial to carry large volumes of traffic. Some municipalities have used incentives to encourage developers to construct internal roads, rather than subdivide along the length of an arterial. For example, a municipality can consider a large frontage requirement on the arterial, such as a requirement that the frontage correspond to the driveway spacing guideline, but a much smaller frontage requirement on the internal road. For projects that are not subject to review, municipalities can also allow narrower internal roads, especially if the subdivision is built around a cul-de-sac.

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Access to Service or Minor Road—Non-residential Development. A municipality can also require that developers of new businesses, shopping centers, and mini-malls provide a common service road parallel to the arterial (Figure 29). The businesses would then front on the service road, rather than the arterial. Vehicles can move between the arterial and the service road at one or two points that can be controlled with a traffic signal if necessary. If there is more than one developer, or if development proceeds piecemeal over time, the community may allow smaller sites to be served by an individual entrance until such time as adjacent lots are developed. When the service road is constructed, the temporary commercial driveways can be closed or consolidated into one or two access points.

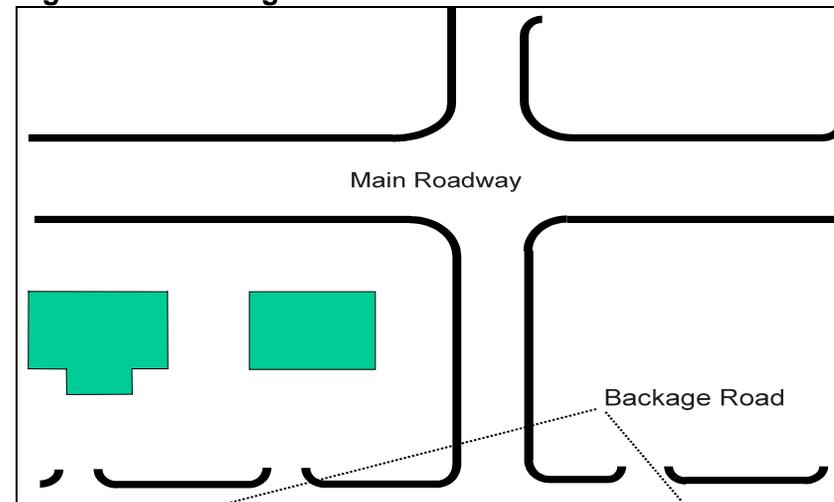
Figure 29—Frontage road



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Frontage roads may cause more problems than they solve if they are not set far enough back from an arterial. If frontage roads are only set back one or a few car lengths from the arterial, additional conflicts are created. The TRB recommends a separation of up to 300 feet between frontage roads at cross streets and the arterial. Problems associated with frontage roads can be overcome through careful attention to design and placement. “Backage” roads with development along both sides are preferable to frontage roads because they allow for greater distance between the connection and the intersection (Figure 30).

Figure 30—Backage road



Corner Lot Access. On corner lots that abut both an arterial and a local road, a municipality can require that access to the proposed development be limited to the local road (Figure 31). This will reduce conflict frequency and severity by diverting some vehicles to roads where traffic volumes and speeds are lower.

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Figure 31—Access to corner lot limited to local road

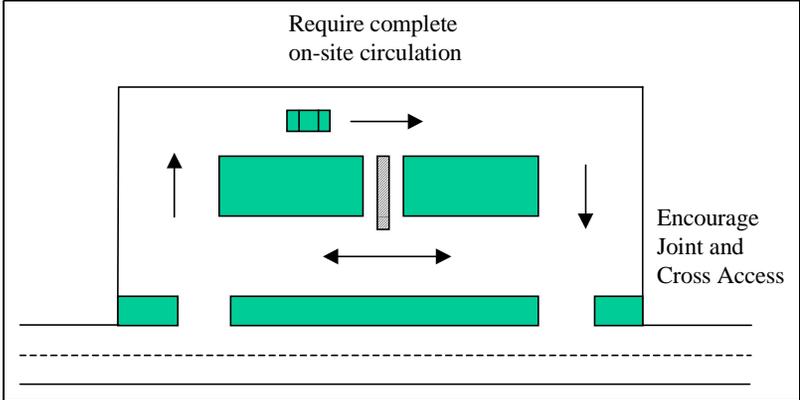


Shared Driveways—Residential Development. Shared driveways are another means of limiting the number of access points along an arterial. The shared driveway guideline should apply to new developments, not existing neighborhoods.

Shared Driveways—Non-residential Development. When a developer proposes to establish more than one business or other non-residential development at a given location, or when a series of adjacent developments are proposed over time, municipal officials have an excellent opportunity to require shared commercial driveways. Shopping centers and mini-malls should have shared commercial driveways (Figures 32–34). However, even a shared entrance for a smaller development involving two or three businesses is beneficial and helps preserve the traffic carrying capacity of the arterial.

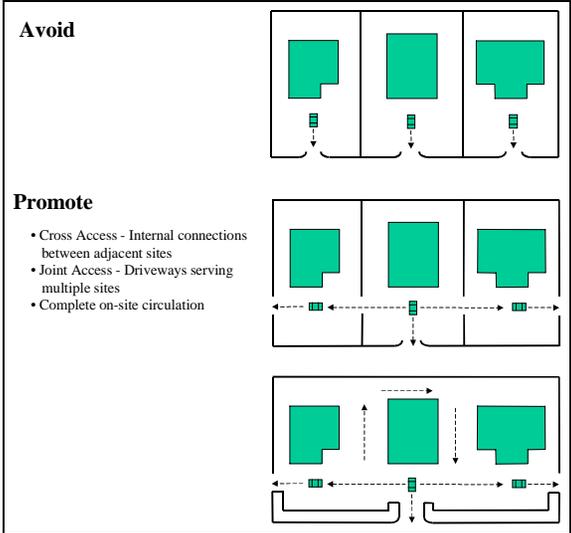
4-Developing an Access Management Program

Figure 32—Shared commercial driveways



Source: Adapted from Endnote (10)

Figure 33—Shared commercial driveway recommendations



Source: Adapted from Endnote (10)

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Figure 34—Businesses sharing a common driveway



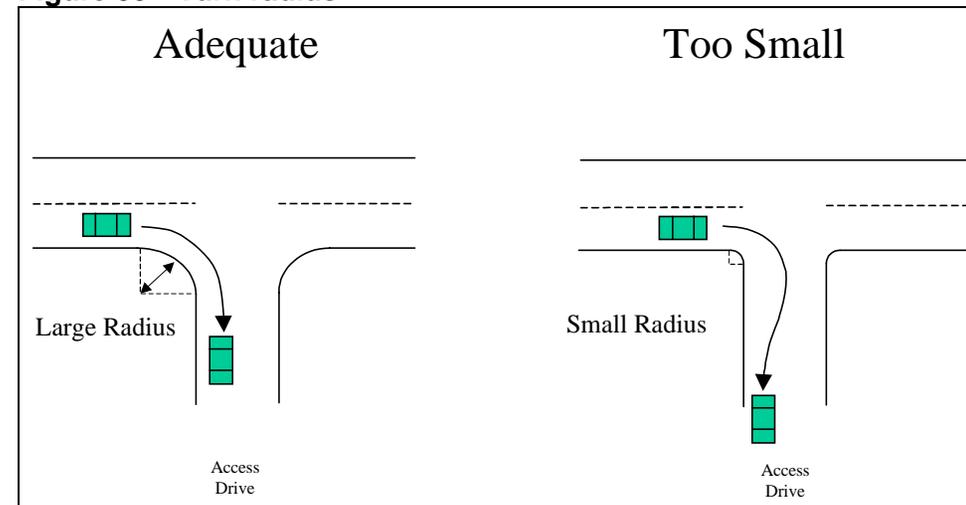
4-Developing an Access Management Program

Removing Slower Turning Traffic from the Arterial

Turn Radius, Driveway Width, and Driveway Slope. Guidelines for a minimum turn radius, driveway width, and driveway slope are important because they help slower, turning traffic move off the arterial more quickly, and help the traffic leaving a driveway turn and enter the stream of traffic more efficiently. Requirements for turn radius, driveway width, and driveway slope are generally applied to non-residential developments and subdivisions.

Turn Radius. The turn radius (or return radius) refers to the extent that the edge of the commercial driveway is “rounded” to permit easier entry and exit by turning vehicles. As shown in the diagram, a larger radius results in an “easier” entrance or exit movement for vehicles. The driveway movement can be performed at a greater speed and with less encroachment into oncoming through traffic (Figure 35).

Figure 35—Turn radius



Source: Adapted from Endnote (2)

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The preferred turn radii will depend on the type of vehicles to be accommodated, the number of pedestrians crossing the access road, and the operating speeds of the accessed roadway. Since larger vehicles require larger turn radii, the turn radius should be designed to accommodate the largest vehicle generally expected to use the driveway. For example, a driveway to a gas station should be designed to accommodate a gasoline delivery truck. A minimum 15-foot turning radius should be provided in areas of heavy pedestrian traffic such as business districts and school crossings. Tighter radii should only be used for serving residential drives from low-speed roadways. In most suburban settings, 25 feet to 50 feet radii are desirable.

Driveway Width. It is important to regulate the maximum width of non-residential driveways. If the driveway is too wide, as is often the case, there is unrestricted access and no curb. The end result may be an enormous driveway, which is unsafe to drivers, who may have a hard time deciding where to position themselves, and to pedestrians, who will have a greater distance of pavement to cross. In the worst case, uncontrolled access across the entire frontage leads to a severe deterioration in the level of service of the arterial and to costly road improvements (Figure 36). On the other hand, if the driveway is too narrow, the access speed to and from the driveway will be slow, impinging on through traffic.

Figure 36—Driveway width: unrestricted access creates potential safety concern



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All noncommercial driveways should normally have a width between 14 feet and 24 feet. Where a driveway is to be used by larger vehicles (farm equipment or trucks) at least a 20-foot width should be provided. Commercial driveways may vary from a minimum 14 to 16 foot wide one-way in or one-way out drive to a maximum of two inbound and three outbound lanes (each at least 11 feet wide).

Driveway Slope. The slope (vertical alignment) of the driveway should not be too steep. Steep driveways force motorists to unduly slow their speed when entering or exiting the driveway. A motorist slowing to negotiate a steep driveway may block through traffic on the arterial, cause through traffic to slow, and create the potential for crashes (Figure 37). In all cases, the profile must be sufficient to provide adequate vertical clearance between the surface and the vehicle. Access drives on major streets should permit the driveway maneuver to be made smoothly and comfortably at a forward speed of at least 10 miles per hour.

Figure 37—Driveway slope: Steep slope forces motorists to unduly reduce speed to negotiate driveway. This vehicle is almost “bottoming out.”



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Driveway Throat Length. Commercial driveway entrances should be designed to prevent a back-up of waiting vehicles on the arterial. This is particularly important for businesses with a drive-through service, or businesses that generate a high number of vehicle trips per day. The depth of the formal entrance way is referred to as the “throat length” (Figures 38–41).

Throat length should be determined on a case-by-case basis, but generally varies according to the number of trips generated by the land use. Table 6 provides examples of different sized retail establishments and recommended driveway throat lengths. A traffic impact study based on peak hour demand is the best way to determine the extent of potential queuing problems and how best to resolve them.

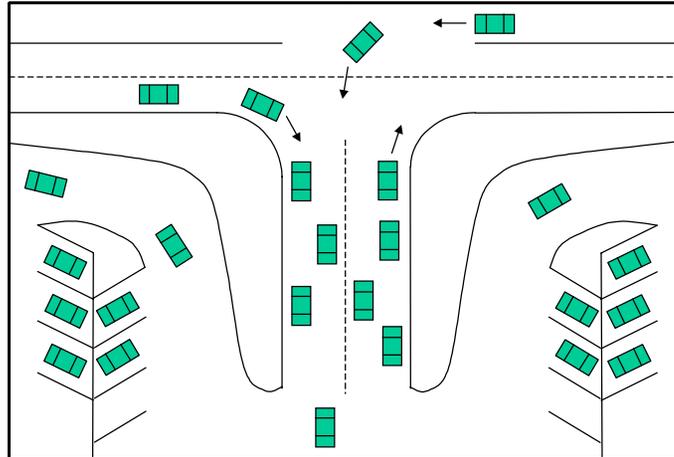
Table 6—Example throat length requirements

Type of Retail Establishment	Recommended Throat Length	Approximate Number of Cars
Small strip mall	75 to 95 feet	5
Small shopping center or large supermarket	200 feet	11
Large regional mall	500 feet	28

Source: Adapted from Endnote (9)

4-Developing an Access Management Program

Figure 38—With adequate throat length, stacking, or queuing, occurs on site. This reduces driver confusion, traffic problems, and unsafe conditions.



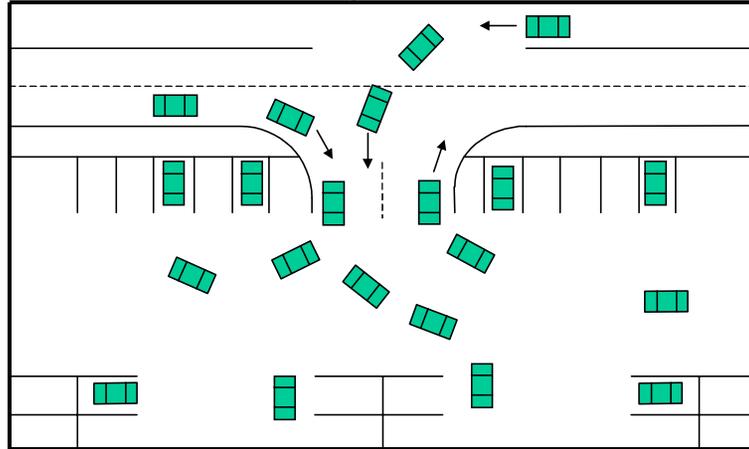
Source: Adapted from Endnote (3)

Figure 39—Good example of sufficient driveway throat length



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Figure 40—Insufficient throat length and poor site planning can cause unsafe conditions and result in vehicles backing out onto the arterial, interrupting traffic flow.



Source: Adapted from Endnote (3)

Figure 41—Example of insufficient driveway throat length



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Landscaped Buffers. Landscaped buffers can be an important access management tool because they can define commercial driveway points and help make them safer (Figure 42). The width of the buffer can vary, depending upon the building setback and the function the buffer serves. It is important that buffers not interfere with sight distances from the exit.

Figure 42—Commercial driveway with wide landscaped buffer



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Right Turn Deceleration Lane. Right turn lanes and tapers help to get turning vehicles out of the through traffic lanes. A municipality can require that a developer install a right turn, or deceleration lane. Right turn lanes or tapers reduce traffic delays that would otherwise occur as through traffic slows to permit turning traffic to exit the arterial (Figures 43–45). A deceleration lane should be used when a specific threshold of turning traffic is reached or when a traffic impact study indicates that a right turn lane is needed. Level-of-service criteria, volume warrants, crash experience, existing traffic operations, or engineering judgment that indicates a safety concern to right turning vehicles can justify the need for right turn deceleration lanes. The length of the deceleration lane will also vary according to the speed of traffic on the arterial. However, the turn lane should be sufficient length to allow the turning vehicle to leave the through lane at the posted speed limit, decelerate, and negotiate the turn.

The 1985 “Highway Capacity Manual” suggests that a separate right turn lane should be considered when the right turn volume exceeds 300 vehicles per hour and the adjacent through lanes also exceed 300 vehicles per lane. Therefore, only fairly large developments, such as a medium-sized or larger shopping center, would warrant a right turn lane. On lower-volume driveways in areas with limited right-of-way, tapers may be used to help remove turning vehicles from the roadway more quickly. Tapers may be most useful in rural areas, where speeds are high and volumes low.

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Figure 43—Right turn lanes

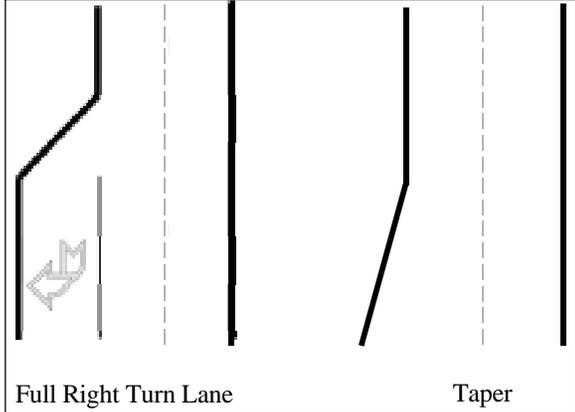


Figure 44—Right turn lane



Figure 45—Taper



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Left Turn Lanes. A left turn lane may be warranted when arterial traffic reaches a specified threshold. The construction of a left turn lane on a heavily traveled arterial can reduce the conflict and delay that occur when through vehicles turn left across traffic. A left turn lane can also reduce conflicts that occur when cars behind the turning vehicle have to slow down, stop, or pass on the right of the turning vehicle. The left turn lane separates the turning vehicle from through traffic and provides a storage area where a number of left turning vehicles can wait to make a turn. Left turns can also be controlled through median strips that allow left turns at certain controlled points (Figures 46–50).

Figure 46—Left turn lane with raised median at intersection

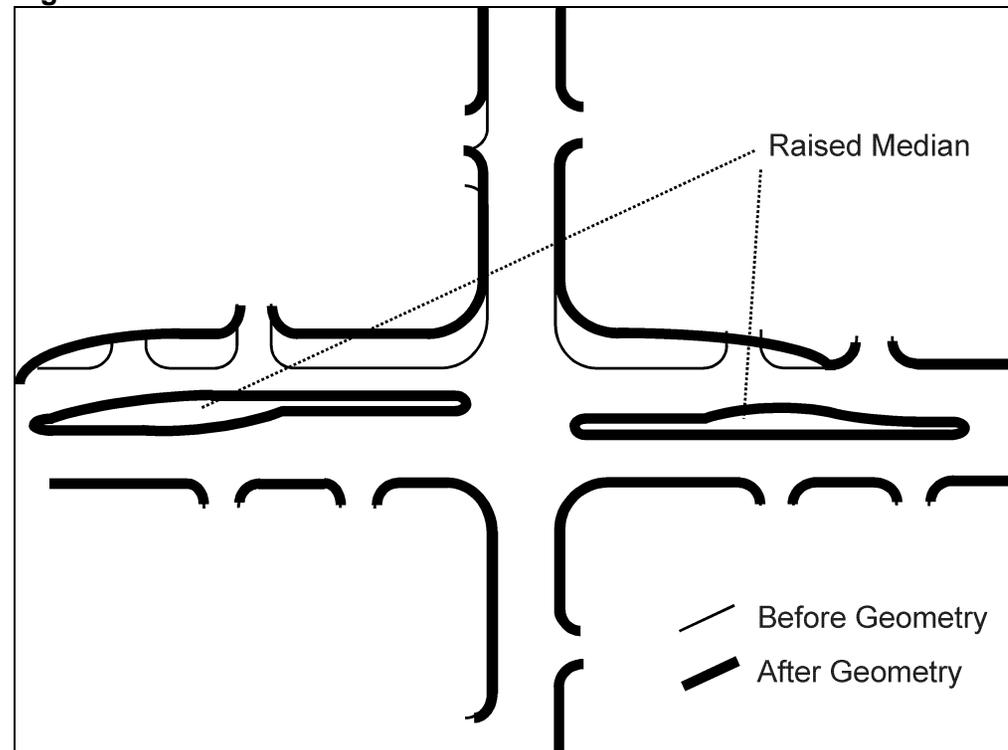


Figure 47—Left turn lanes with continuous raised median

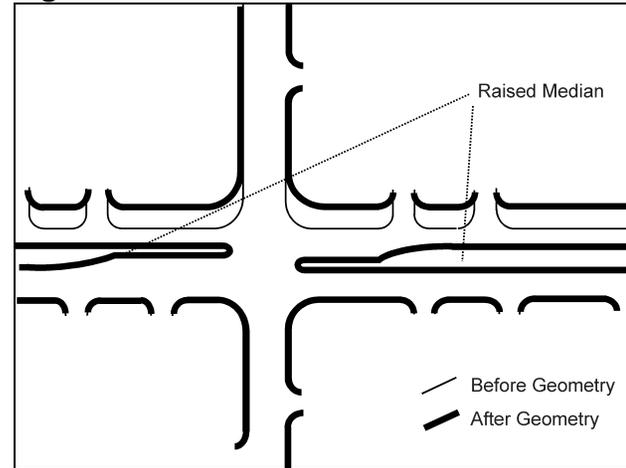


Figure 48—Left turn lanes with continuous raised median



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Figure 49—Continuous two-way left turn lane

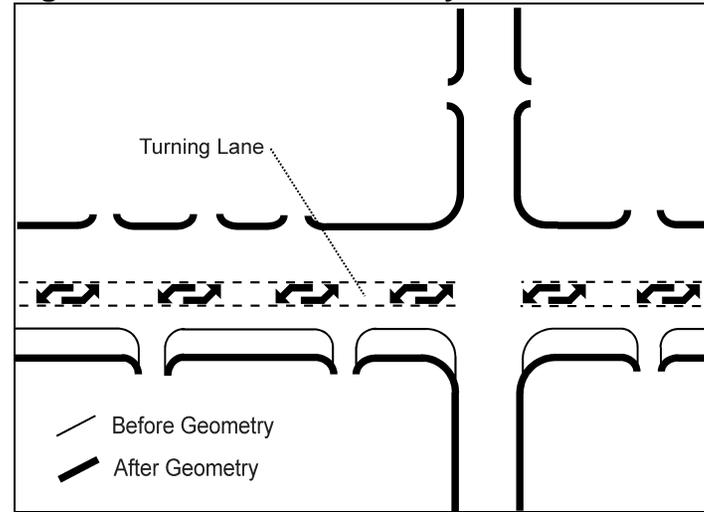


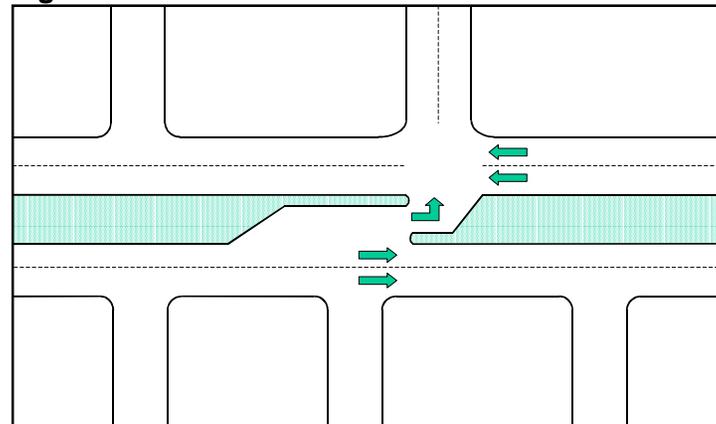
Figure 50—Continuous two-way left turn lane



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When medians extend the full length of a road, the spacing of intersections and median breaks are crucial to providing access to properties on both sides of the road. In Figure 51, the median break allows for a left turn onto the side street. The median prevents vehicles from crossing the arterial and making left turns from side streets onto the arterial. Median breaks should generally only be provided at public road intersections or at driveways shared by several businesses. They should generally not be provided for access to individual businesses or residences. The number of median breaks should be kept to a minimum since they add conflict points and detract from safety.

Figure 51—Median breaks



Source: Adapted from Endnote (12)

Table 7 compares advantages and disadvantages of raised medians and two-way left turn lanes. Raised medians fully separate opposing traffic, define where turns and crossings are allowed, and provide a safe refuge for pedestrians. Raised medians are most desirable at major activity centers where relatively few high volume driveways provide access to adjacent properties. Where left turn lanes are not provided, raised medians limit land access to right turns only. Two-way left turn lanes are most appropriate for arterials that have a relatively high number of low volume driveways, such as strip commercial developments. However, selecting the appropriate design is a complex process that

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involves consideration of many factors, including the number of through lanes, through traffic volumes, left turn volumes, access point density, and land use.

Table 7—Advantages and disadvantages of raised medians and two-way left turn lanes

Raised Median	
<i>Advantages</i>	<i>Disadvantages</i>
<ul style="list-style-type: none"> + Discourages strip development + Allows better control of land uses by local government + Reduces number of conflicting maneuvers at driveways + Provides pedestrian refuge + If continuous, restricts access to right turns only + Reduces crashes in mid-block areas + Separates opposing traffic 	<ul style="list-style-type: none"> - Reduces operational flexibility for emergency vehicles - Increases left turn volumes at median openings - Increases travel time and circuitry for some motorists - May increase crashes at openings - Limits direct access to property - Operating speed usually limited to 45 miles per hour
Two-Way Left Turn Lane	
<i>Advantages</i>	<i>Disadvantages</i>
<ul style="list-style-type: none"> + Makes use of odd-lanes + Reduces left turns from through lanes + Provides operational flexibility for emergency + Safer than roads with no left-turn lanes or medians + Facilitates detours + Separates opposing traffic 	<ul style="list-style-type: none"> - Encourages random access - Illegally used as a passing or acceleration lane - Offers no refuge for pedestrians - Higher maintenance costs - Operates poorly under high volumes of through traffic - Allows head-on crashes

Source: Adapted from Endnote (9)

4-Developing an Access Management Program

Other Access Management Strategies

Traffic Impact Study. A traffic impact study is a report that analyzes how traffic generated by a proposed project will change existing traffic conditions on the arterial. A traffic engineer working for a developer, a neighborhood group, city, county, or the Iowa DOT may prepare it. Depending on the type and size of development, the impact study may range from a cursory examination of the site, the projected traffic volumes, and the impact on adjacent streets, to a detailed report that analyzes the estimated impacts of the development on a wide area and recommends a number of mitigation measures. A traffic impact study can be an integral part of a municipality's development review process. There are a number of reasons for preparing a traffic impact study:

- It ensures that the driveway and on-site circulation plan will be safe before it is built, thus avoiding or minimizing costly corrective action.
- It can result in better access management.
- It places the responsibility for congestion mitigation on the developer.
- It saves the community/county/state future costly highway improvements.
- It offers an opportunity for the municipality and developer to work together jointly to improve traffic conditions.

A traffic impact study should be required when a proposed new development, or change of use, will generate traffic in excess of a specified threshold established by the community. If the number of vehicle trips at the proposed driveways during a one-hour period exceeds this threshold, a modification or alteration would be needed to prevent increased congestion.

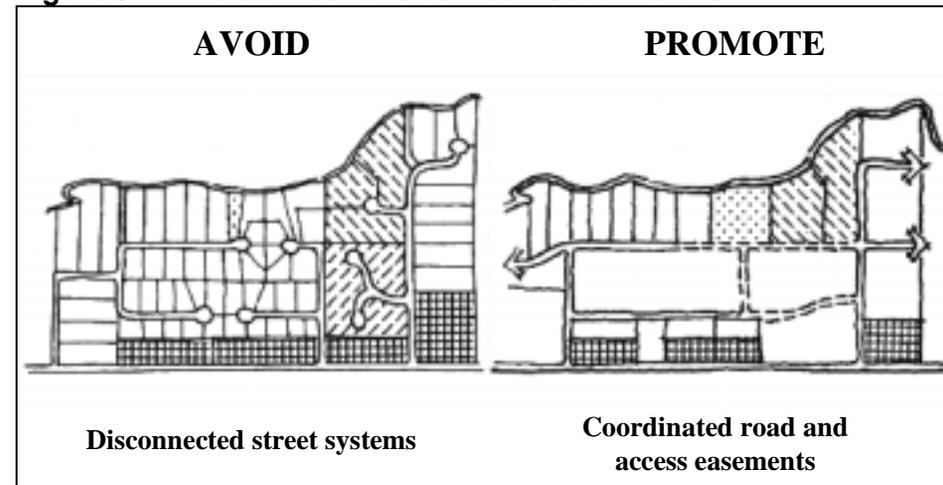
A traffic impact study should also be required for proposed changes in the use of a commercial or industrial site, and for projects in problem areas where there is a high crash rate or where the adjacent arterial is near its design capacity. Based on the results of the traffic impact study, a developer may be required to undertake on-site or off-site improvements (turning lanes, traffic signal improvements) to

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mitigate the negative impacts that the development may create. The requirements for a traffic impact analysis should be included in a local ordinance.

Interconnections—Subdivisions. Requiring developers to provide interior roads on property they subdivide along arterials is an important step in maintaining safety and preserving capacity, but it may not be enough in a growing community. When a number of subdivisions are built adjacent to one another, each with its own access to the arterial, drivers may use the arterial to travel from one subdivision to another, thus contributing to highway congestion. A simple remedy is to require that a subdivision contain connecting points to adjacent, undeveloped land, where feasible, and that adjacent subdivisions inter-connect. This can reduce traffic on the arterial and help create a sense of community continuity, rather than isolation (Figure 52).

Figure 52—Interconnections between subdivisions



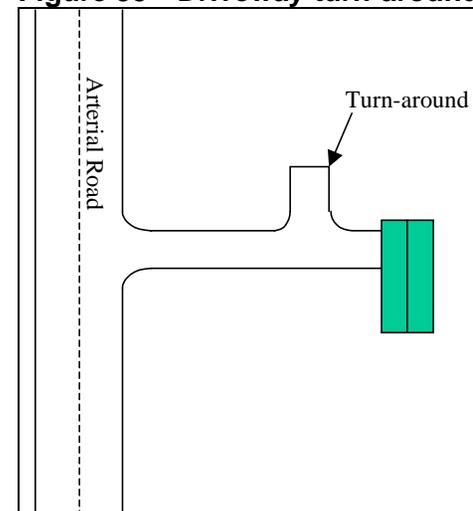
Source: Endnote (10)

4-Developing an Access Management Program

Interconnections—Commercial Development. A municipality may encourage or require that new commercial developments be designed to connect with adjacent commercial development or, if the adjacent land is vacant, to allow for future internal connections. Requiring internal vehicle connections will limit the number of times a driver has to enter the arterial when traveling between adjacent businesses.

Driveway Turn-Around Area. Some jurisdictions require that private driveways on arterials have a turn-around area, as shown in Figure 53. A driveway turn-around eliminates the need to back out onto an arterial, which can be a potentially hazardous maneuver. While driveway turn-arounds are relatively rare, they are an example of innovative thinking that could increase traffic safety on an arterial. No Iowa cities were known to have a law requiring a driveway turn-around at the time of this publication, but a turn-around's benefits can be observed where homeowners have voluntarily installed this type of treatment for their own safety.

Figure 53—Driveway turn-around area



Source: Endnote (3)

4-Developing an Access Management Program

Parking. The capacity and safety of an arterial can be compromised by the lack of off-street parking or by poorly designed parking facilities. In downtown areas, a city can provide municipal off-street parking facilities in conjunction with on-street, parallel parking. A municipality can also limit on-street parking during peak traffic hours. In all other areas, a municipality can require that businesses provide off-street parking.

Loading/Unloading. Truck loading/unloading operations can have a negative impact on traffic flow if any portion of the arterial is blocked, if backing movements take place on the arterial, or if the truck blocks or impedes the entrance to a commercial business. A municipality can include guidelines for loading bays and on-site maneuvers. When on-street deliveries are the only alternative, such as in an old downtown area, municipalities can restrict peak hour deliveries and pickups.

Public Transit. Improved transit access requires attention to the proximity and mix of land uses, continuity of pedestrian and bicycle ways, and coordination of land use and transit decisions. Mixed use activity centers, for example, create transit destinations and are more consistent with access management principles than strip development.

Clustering transit-compatible uses around a bus turn-around or locating buildings near the street line with parking in the rear provides more direct pedestrian and transit access and helps facilitate shared access. Bus pullout bays for transfer points reduce vehicular conflicts and preserve traffic flow by removing buses from through-traffic lanes.

Local governments and transit agencies may ensure that sites have adequate transit access by coordinating on a review of development sites. This may include guidelines for transit stops and stations, bicycle parking, bicycle paths, sidewalks, and direct bicycle and pedestrian access to buildings (Figure 54).

Figure 54—Bus pullout bay



Pedestrians and Bicyclists. Almost all access management designs and operational strategies impact pedestrians and bicyclists. In general, pedestrians and bicyclists need to be well protected where they cross major streets. Where vehicles cross pedestrian or bicycle facilities, the design should accommodate vehicles at low speeds. The following strategies promote pedestrian and bicycle travel.

- *Driveway spacing.* Larger driveway spacing reduces conflicts and hazards.
- *Sidewalk location.* Locating sidewalks away from the curb offers many operational and safety benefits. If the buffer strip is of an adequate width, drivers can pull completely out of the traffic stream before yielding to a pedestrian. Pedestrians are separated from street traffic and better protected.
- *Medians.* Medians offer areas of safe refuge to pedestrians. Pedestrian crash rates are lower on roads with raised medians than on undivided highways or those with continuous two-way left turn

4-Developing an Access Management Program

lanes. Medians with cut throughs and adequate storage space promote pedestrian and bicycle safety.

- *Mid-block crossings.* Mid-block pedestrian crossings can reduce crashes, travel distance, and inconvenience.
- *Right turn lanes.* Right turn lanes can reduce speeds at the sidewalk crossing and reduce conflicts and confusion. Right turn lanes provide a dedicated space for vehicles to decelerate and turn using a minimum turn radius. This allows for slower turning speeds and narrower crossings for pedestrians.

Table 8 offers an example multi-modal access plan as a guide for anticipating a project's transportation needs.

4-Developing an Access Management Program

Table 8—Example multi-modal access management plan

Access Level	Description/Function	Transit	Pedestrian	Bicycles
<i>Freeway/ Expressway</i>	High-speed, long distance travel Motor vehicle access only at grade-separated interchanges All direct access rights to property by deed	Regional transit stations Express bus service	Consider provision of independent trails Provide grade-separated crossings where needed Accommodate pedestrians at interchanges & grade separations	Consider provision of independent trails Provide grade-separated crossings where needed Accommodate bicyclists at interchanges & grade separations
<i>Other Strategic Arterials</i>	Move people and goods over long distances Properties may have right-in, right-out access where access rights have not been acquired & where there is no reasonable alternative access Wide spacing required for motor vehicle entrances and street intersections	Express bus service Transit stops and flag stops	Provide parallel pedestrian facilities in developed areas Accommodate pedestrians at intersections Provide grade separated crossings and mid-block crossings where needed	Shoulders may be useful for bicycle trips Merge and diverge locations need to be managed
<i>Minor Arterials & Collectors</i>	Serve motor vehicle traffic while accommodating other travel modes Serve moderate distance traffic that may operate at high or moderate speeds Moderate spacing guidelines	Location of most transit routes Provide transit stops at subdivisions and developments	Provide sidewalks on both sides in centers and multi-modal areas Land developments must accommodate pedestrian mobility and access Provide cross-walks at intersections Consider mid-block crossings with refuges where pedestrian crossings are likely Employ appropriate traffic calming measures where needed	Location of most bicycle travel Consider designating bicycle lanes or routes Land development should assure good bicycle access and parking
<i>Local Streets</i>	Provide convenient access to property Driveway spacing as close as 50 feet Discourage through traffic and speeding through roadway design	Assure good and direct pedestrian connections to higher volume streets with transit service	Sidewalks normally required Provide linkage trails if street layout restricts pedestrian mobility Assure a safe walking environment	Low traffic volume and speed accommodates bicycles Can be used with linkage trails to create alternative bicycle routes

Source: Delaware Dept. of Transportation

5-Access Management and the Comprehensive Plan

The Comprehensive Plan

Access management is just one aspect of planning for your community's future. Access management is a tool to be used to improve the flow of people, goods, and services. Ideally, it should be an outgrowth of the comprehensive plan. Good access management guidelines are best implemented after a city has determined

- *land patterns*—where development should be encouraged and where it should be limited. This is extremely important because future land development patterns can have a tremendous impact on traffic conditions, and can accomplish more than access management alone in reducing future traffic problems on arterials;
- *traffic flow*—the extent to which traffic on the arterials in the community has increased in recent years and is likely to increase in the future; and
- *the plan's relationship to access management*—how the community's transportation and land use policies can be enhanced by sensible access management guidelines.

The Role of the Comprehensive Plan

A local comprehensive plan is an important policy document that establishes the direction of future development and conservation in the community. There are many ways in which the comprehensive plan can address access management issues and set the stage for an effective local access management program.

Goals, Policies, Strategies

The comprehensive plan's goals, policies, and strategies can directly address strip development along the community's highway arterials by recommending one or more of the following:

- Designate compact growth areas and limit the amount of development that can take place in rural areas along arterials.

5-Access Management and the Comprehensive Plan

- Prohibit strip development along arterials, including a proliferation of single-lot, house-by-house development.
- Develop regulations to require that development along the arterials be clustered or limited to certain areas.
- Include guidelines (such as those described in Chapter 4) in a local ordinance to ensure that arterial development will not significantly reduce traffic safety and traffic carrying capacity.
- Require traffic impact analyses and site plans for all developments exceeding a certain threshold.
- Meet with officials of adjacent communities to review transportation issues and develop a coordinated, regional approach to access management.

Table 9 offers an example of a plan's guidelines.

Capital Investment Plan

The capital investment plan (CIP) can include recommendations that developers be required to pay for some or all of the transportation and other public improvement costs necessitated by their developments. The CIP can recommend that future public investments discourage strip investment. For example, the CIP can state that there will be no sewer extensions along the arterials.

Future Land Use Map

The city's future land use map can include recommended zoning patterns that will direct future growth away from the community's arterials (Figure 55). The most obvious approach is to delineate future growth areas adjacent to the community's arterials for rural or low density residential development. Other alternatives are described in the following section.

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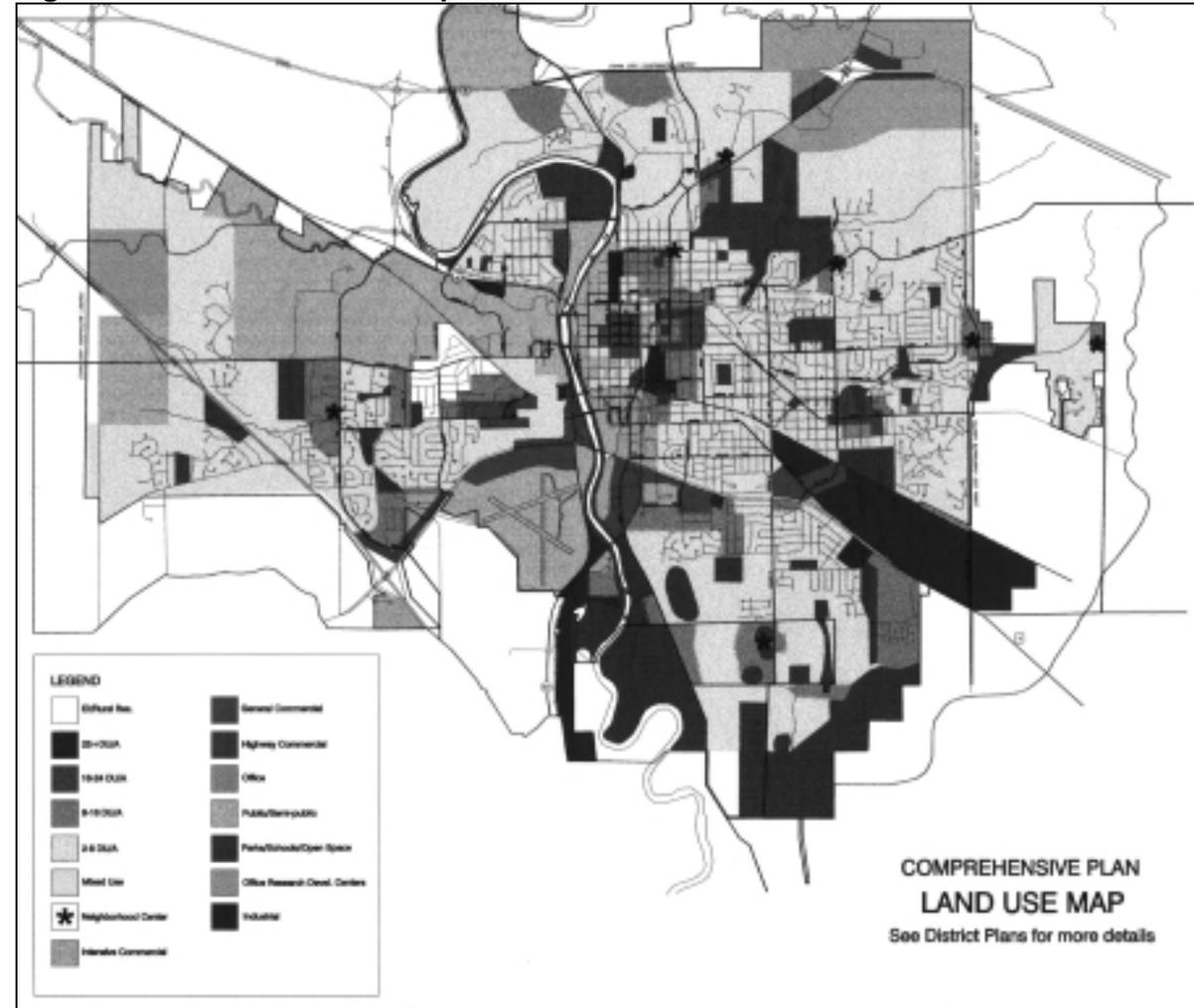
Table 9—Example guidelines

Functional Class	Function	Traffic Speed (mph)	Design Volume (ADT)	No. of Lanes	Direct Driveway Access	Turning Movements	Sidewalks
<i>Freeway/ Expressway</i>	Inter-community circulation	55 - 65	Unlimited	4 - 6	None, controlled access	Fully controlled	None
<i>Primary Arterial</i>	Inter- & intra-community circulation	35 - 55	15,000 to 30,000	2 - 4	None	Separated	None
<i>Secondary Arterial</i>	Intra-community circulation; land access	30 - 45	2,500 to 20,000	2 - 4	Limited to large developments	Separated as necessary	None
<i>Collector</i>	Distribute traffic between local streets & arterials; land access	25 - 35	1,000 to 5,000	2	Yes, but limited	Separated as necessary	On one side only, if necessary
<i>Local</i>	Land access	20 - 25	Less than 1,000	2	Yes, Unlimited	No separation	One or both sides

Source: Adapted from Endnote (5)

5-Access Management and the Comprehensive Plan

Figure 55—Future land use map



Source: Endnote (14)

5-Access Management and the Comprehensive Plan

Managing Future Commercial Growth

This section contains suggestions on how the comprehensive plan, and ultimately the local zoning ordinance, can direct future growth in a manner that avoids strip development. This discussion focuses on commercial development because it is this type of development that can have the greatest impact on traffic patterns, safety, and the traffic carrying capacity of the arterial. The general principles, however, can be applied to all types of development.

Too often the land adjacent to an arterial is zoned for commercial development. This pattern encourages commercial strip development, which in turn creates safety problems, congestion, and ultimately the need for expensive highway improvements or even the need for a bypass around the area. A better approach is to concentrate the commercial district around existing centers of development (Figures 56 and 57). Secondary roads, intersections, or frontage roads can then handle the traffic impacts and help keep local traffic off the arterials.

Figure 56—K-150 Highway Access Management Plan

The City of Overland Park, Kansas has been administering an access management plan along the K-150 Highway for over 10 years. It is a proactive effort of Overland Park and the neighboring communities of Leawood and Olathe to preserve the transportation function of the corridor and surrounding street network while accommodating expected growth. The plan was conceived when the corridor was largely undeveloped. The plan provides for a divided multi-lane highway with median breaks at half-mile intervals, right-turn-only access at quarter mile points between median openings, and policies on driveway spacing. In addition, a system of parallel access roads was planned to provide alternative access for higher intensity development. Despite periodic pressures to provide exceptions, City staff have been largely successful in achieving the access management objectives. Reasons include consistency of recommendations, adequate preparation and analysis of proposed deviations, adherence to principles of good access design, periodic refresher sessions on the plan for public officials, and a willingness to "roll with the punches."

Source: Endnote (10)

5-Access Management and the Comprehensive Plan

Commercial Cluster Development

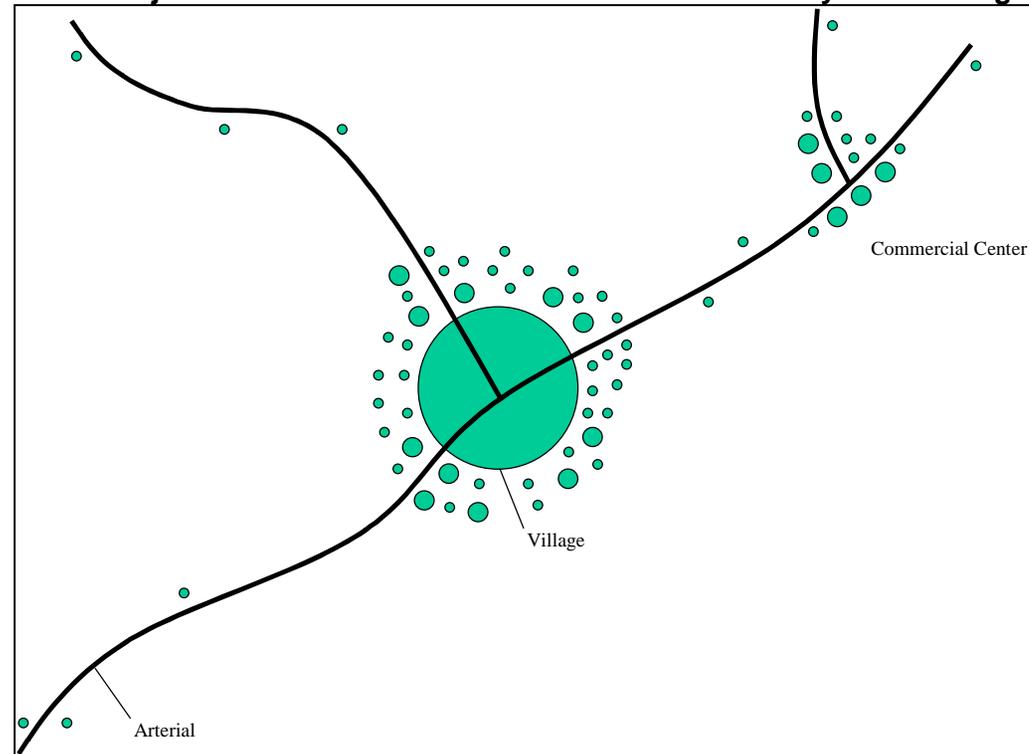
As an alternative to allowing commercial structures to be located uniformly along an arterial, a municipality or county with zoning authority can require that new commercial buildings be sited in small clusters (as in an industrial park), be set back from the arterial, and have well landscaped areas between the clusters. In this approach, a section of the arterial may be zoned for commercial development, but only cluster developments are permitted. Cluster development works best where there are large parcels that allow room for several businesses on one lot. It probably won't work where the arterial is already lined with small developed parcels. The cluster concept can be applied successfully to shopping centers, mini-malls, and multiple-use facilities.

Commercial Centers

Another alternative to a continuous strip of commercial development is to create commercial centers located near major intersections that have the capacity to handle more traffic. These centers could include secondary road networks. The areas between commercial centers can be placed in a zoning category other than commercial. The community can help construct access roads that make these centers highly visible, accessible, and commercially viable. A municipality or county can ensure that the centers are the only areas to be developed commercially by designating commercial zones only at or near intersections. This should leave the arterial relatively free flowing (Figure 57).

5-Access Management and the Comprehensive Plan

Figure 57—Managed growth can concentrate new development near the existing town center, cluster several small businesses into one mini-mall, and/or establish a commercial center near a major intersection. This leaves the arterial relatively free flowing.



Source: Endnote (3)

5-Access Management and the Comprehensive Plan

Rural Business Districts

A municipality or county can take steps to preserve its rural character and still allow certain types of rural commercial development. A rural business zone might allow residential developments, home occupations, professional offices, tourist or agriculture-related businesses, and farm stands. It would not allow other types of commercial developments, including the types of retail operations that could just as easily be located in the downtown or growth area of the community.

Low-intensity Commercial Districts

A municipality or county can use its zoning powers to not allow businesses that generate high traffic volumes from locating in areas where they will create traffic problems. Such limits might be appropriate where the arterial is at or near capacity, where there are visibility problems, where the road grade is steep, or where there are other safety problems. Limits might include prohibitions, size limits, or a requirement for a traffic impact analysis plus remedial measures.

Retrofitting Existing Corridors

One of the challenges in managing access is how to improve access on already developed corridors. The level of demand on our transportation system has changed and so has our understanding of the issues and problems. As communities grow and change, roads originally intended to provide access to homes or businesses may be needed to serve through traffic. In addition, some of the access problems we now see are the result of poor subdivision and zoning practices in the past. It is much more difficult to manage these competing demands and solve access problems after the fact.

Common problems include limits to the right-of-way, development in close proximity to the right-of-way, and opposition by owners of adjacent properties and affected businesses. Land for access improvements is often unavailable, making it impossible to implement certain access management techniques and requiring the use of minimum rather than desirable guidelines. In addition, rights for access to property must be respected. Therefore, the most successful retrofit projects involve adjacent landowners and businesses in planning the access project from the earliest stages of project planning.

5-Access Management and the Comprehensive Plan

One strategy is to prepare access management plans for the higher priority corridors in the community. Restrictive medians with carefully designed crossovers are useful for controlling turning movements and improving safety on already developed corridors. Special corridor zoning and overlay zones can be designed to address the unique circumstances of the corridor while advancing access management objectives. Local ordinances can also include retrofitting guidelines that specify when existing users must come into compliance with the new guidelines, such as (1) substantial enlargements or improvements, (2) significant changes in trip generation, or (3) when new connection permits are requested. These represent opportunities to improve access to an existing corridor.

Table 10 highlights a variety of access techniques that can be used to retrofit existing roadways.

Table 10—Potential retrofit techniques

Driveways	<ul style="list-style-type: none">- relocate, consolidate, eliminate- promote shared driveways- increase corner clearance- improve turn radius and driveway width- increase throat length- prohibit left turns out of driveway- decrease slope
Turn Lanes	<ul style="list-style-type: none">- add or redesign left-turn lanes- add or redesign right-turn lanes or tapers- close or redesign median openings- add 2-way left-turn lane- add raised median
Service Roads	<ul style="list-style-type: none">- provide backage road- provide or redesign frontage road

Source: Adapted from Endnote (2)

5-Access Management and the Comprehensive Plan

Example Retrofit Project: North Ankeny Boulevard

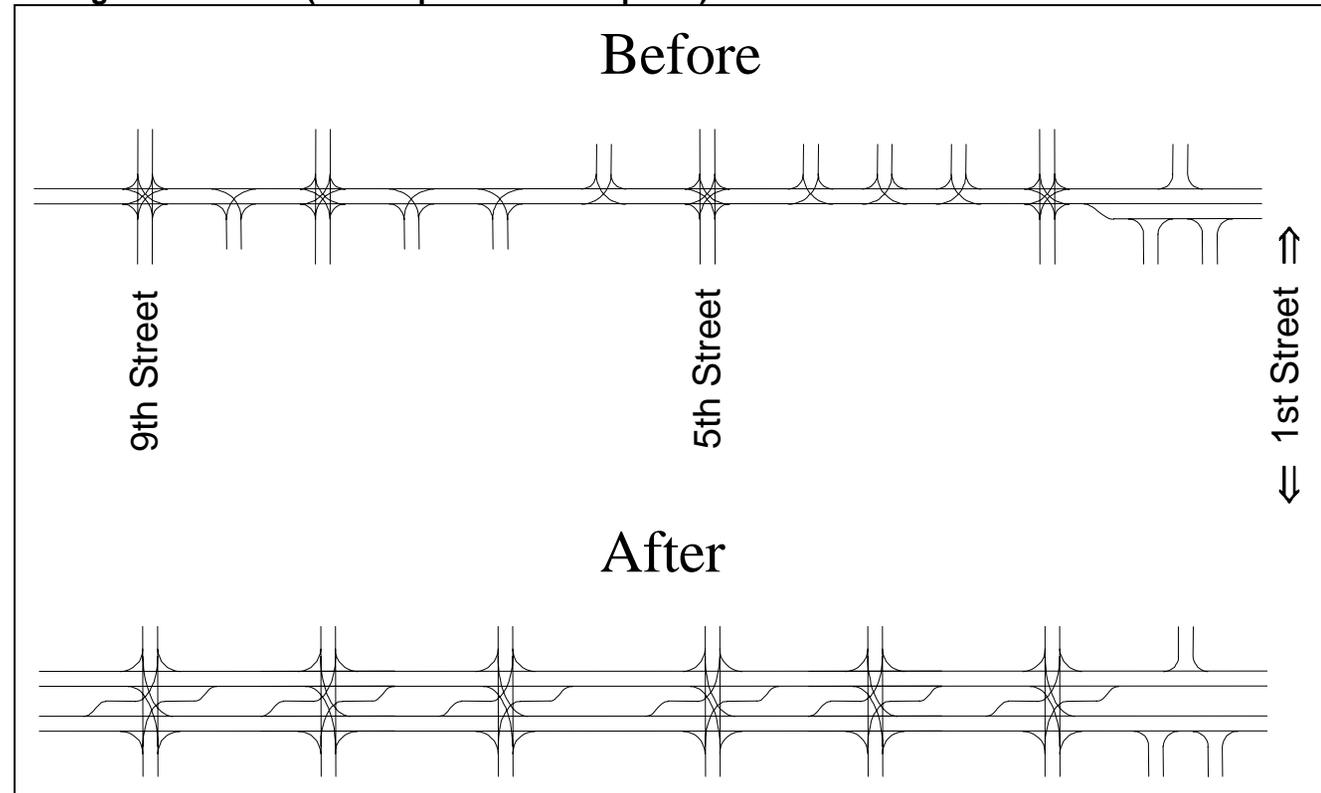
A number of these techniques were used to retrofit a one-mile segment of North Ankeny Boulevard in Ankeny (see Figure 8 in Chapter 3). Ankeny Boulevard (U.S. 69) is the main north-south arterial through Ankeny and the city's major commuter route to and from Des Moines.

Prior to reconstruction, Ankeny Boulevard was a two-lane undivided highway, and almost all businesses were allowed direct access. Due to rapid growth, increasing congestion, and increasing crash rates along the corridor, the City of Ankeny undertook a \$2.5 million program of access improvements for North Ankeny Boulevard. Major improvements included conversion from a two-lane facility to a four-lane divided road with a 15-foot wide landscaped median and left-turn bays. Right-of-way was taken on both sides of the roadway, and access to business was concentrated at median openings and intersections. Minor improvements included the redesign of existing frontage roads and improved access between adjacent parking lots (Figure 58).

Following the completion of the project, traffic volumes increased by an average of over 4,000 vehicles per day while crash rates dropped almost 37 percent and the level of service improved from a "D" rating to a "B" rating. "D" indicates that some delays and congestion are present, while "B" indicates a situation in which traffic flows very freely.

5-Access Management and the Comprehensive Plan

Figure 58—Conflict point diagram of North Ankeny Boulevard before and after access management retrofit (lines represent traffic paths)



Source: Endnote (7)

Public Involvement in Access Management

Government actions that affect property access tend to be controversial. Concerns over infringement on private property rights, impact on business sales volumes, the potential for “cut through” traffic in neighborhoods, the safety of U-turns, and adequacy of access for trucks are among the issues that frequently arise in relation to access control. Experience indicates that people will become involved in these decisions whether or not they are offered a formal opportunity.

Access management projects are frequently considered to be exempt from public involvement requirements. In addition, when public involvement is provided during the initial study phase, it is generally not required during the design phase, when many access decisions are made. As a result, public involvement has not been consistently provided for access management projects.

Access management projects have been impeded or derailed because the public was not involved in the decision-making process or was involved too late for meaningful discussion. Without a process for responding to public concern, public agencies may face intense pressure to concede to demands for unrestricted access. A lack of a good public involvement process increases the likelihood of administrative hearings and litigation, and reduces the potential for a successful outcome. The challenge, therefore, is to involve the public in a way that is productive and meaningful for them and the transportation agency.

This chapter discusses the challenges of designing a public involvement program for access management projects. As with any good public involvement program, strategies are designed to facilitate open communication with affected parties and adequate public involvement at key steps in the decision-making process. This will help minimize conflict, foster public trust, and safeguard projects against arbitrary or undesirable changes.

Sources of Conflict

Public agencies have encountered a variety of obstacles to working with the public on raised median projects and other access issues. Inadequate information and public involvement prior to the public hearing can give rise to rumors, misinformation, and heightened anxiety about the project or action.

6-Public Involvement

This can be compounded by the difficulty project managers experience in communicating the concepts of access management and the technical basis for their decisions. The primary beneficiary of access improvements, the traveling public, is often a silent bystander. Research in Florida on public involvement in median projects indicates that conflict over median decisions is highest when the public is not fully involved in these projects.

Those persons who do get involved are typically those who feel they will be adversely affected. They tend to be less receptive to the potential public benefits and instead focus on how the project will affect them individually, including how it may affect the level of through traffic in their neighborhood, the development potential of their property, or the accessibility of their business. Therefore, it may appear to decision makers as if a project has little public support, even if it does. The result is pressure for major changes in the project as affected parties appeal their case to elected and agency officials.

When the public is not involved throughout the decision-making process, key issues may be overlooked until it is too late to provide the public with a reasonable opportunity for involvement. Specific changes may not be identified until the design phase, and affected parties may not be aware of these changes until the public hearing. This problem can be exacerbated by a lack of continuity and public follow-up as the project progresses from the study phase to design and production. The earlier you involve the public or affected property owners, the more likely you will be able to incorporate reasonable changes in response to their concerns. This reduces the potential for delays.

Benefits of Public Involvement

An effective public involvement program

- builds trust and enhances relationships
- strengthens agency credibility
- educates and informs
- increases the likelihood of public acceptance
- reduces costly delays
- helps avoid hearings or litigation
- leads to better outcomes
- makes it more likely that decision-makers will approve the project

Research in Florida indicates that agencies with a public involvement process for median projects report greater success in achieving their objectives and fewer appeals to management or requests for administrative hearings than those who relied on public hearings. An effective public involvement program can safeguard an access management project against arbitrary or undesirable changes, avoid costly delays and hearings, and reduce resentment that can lead to future retaliation. It can build trust and enhance relationships with the public, elected officials, and other agency staff. Public involvement increases the likelihood of public acceptance and leads to better project outcomes.

As presented in Chapter 3, research in Iowa found that access management may help to enhance general business activity in the project corridor. The Iowa research also found that most, but certainly not all, business owners and managers supported access management projects upon completion of the project. By working closely with business and property owners, agencies have a better opportunity to communicate the benefits of the project and tailor the design to meet specific needs.

6-Public Involvement

Principles of Public Involvement

The following are principles of public involvement. They will help to minimize conflict, foster public trust, and achieve broad-based support from the public and policy makers for access management decisions.

Ensure a fair, reasonable and open process

Participants should agree that the decision-making process is fair and reasonable, they are being heard, and their concerns are being considered. People will be less likely to accept a project or decision if they feel it is being imposed on them or that the process that produced it is not legitimate. Furthermore, people may be more likely to accept some hardship if they have been treated fairly in the decision-making process.

Following are several techniques used to promote an open process:

- An *open house* meeting format may be less contentious and more conducive to constructive dialogue than a public hearing format. A public hearing gives an impression that a decision has already been made. Open houses are an informal, non-threatening format for presenting projects to the public and soliciting ideas, and can be used to gauge the public's opinion of the project.
- A *charette* is a useful meeting forum for resolving an impasse or focusing on a single issue with a range of potential solutions. Within a specified time limit, participants work together intensely to reach a resolution. The sponsoring agency usually sets the goals and time limit and announces them ahead of time. This allows citizens and interest groups opportunities to gain hands-on experience with the problem at hand, under the guidance of technical staff and a professional facilitator. A charette can generate enthusiasm toward a project, build public ownership in the solution, and educate both the public and the agency about the project and the trade-offs involved in selecting an appropriate alternative.
- A *local citizen task force* can be used to directly involve citizens, landowners, and business people in the design of a project. Although this approach may be more time consuming, it is useful for

encouraging collaboration and achieving resolution of complex or controversial issues. Task force members are responsible for deliberating key issues and formulating appropriate courses of action. This approach may be particularly useful for developing a comprehensive access improvement program for an existing corridor. A local citizen task force was used in the corridor improvement program described in Figure 59.

Involve stakeholders

The objective of public involvement on controversial projects is to bring public concerns to the forefront so they can be debated and resolved. Seek out major stakeholders and actively solicit their involvement. Never exclude anyone who wants to participate. Such exclusion creates suspicion of the agency's intentions and could transform potential participants into opponents.

The level of public involvement will vary according to the level of public interest. Those directly affected by the project or who attach a high significance to the outcome are the primary stakeholders.

Early and ongoing public involvement will be required for this group to build consensus and resolve disputes. Those who are interested, but less directly affected, will need to be involved and apprised of the outcome. Find out how they want to be involved and their preferred method of being informed. The general public can be kept apprised through public outreach and information. Press releases and radio announcements are examples.

Figure 59 illustrates a unique method used to involve stakeholders in an access project in Iowa. The figure shows one frame of an animation developed to illustrate proposed access improvements to an arterial roadway. The proposed improvements were comprehensive, including adding a TWLTL, consolidating driveways, and moving utilities farther from the roadway. Among other information, the animation was shown to stakeholders, including adjacent property owners and business people, to show the how the project would look when completed and demonstrate its benefits.

6-Public Involvement

Figure 59—Frame of an animation showing proposed access improvements to an existing corridor in Iowa



Source: Endnote (13)

Begin early and parallel the decision process

Public involvement is not a discrete task, but rather an ongoing process that should parallel the technical decision-making process and be integrated into the entire work program. Provide for public involvement at each key decision point.

Maintain continuity of involvement as the project progresses

Continuity is crucial in the public involvement process because (1) different groups get involved at different stages of the project, (2) more people get involved as the project progresses, and (3) continuity helps keep the project on track. People tend not to get involved unless the issues are clear, they feel the issues are significant, and they feel they have a contribution to make. Therefore, more people will become involved as the project is defined and people can more clearly see how it will affect them. For a lengthy process, one option is to prepare a summary report of the decisions and commitments

that have been made and the process through which they were reached. This history of the public's influence on the project is an essential part of the project documents. It is important that commitments are carried through into construction. Affected parties will need to be apprised of any changes that are desired during the design, right-of-way acquisition, or construction phases.

Inform the public of the agency's basis for making decisions, including policies and guidelines

The public should be informed of the agency's access policies and guidelines, as these are important factors in the decision process. Concerns from elected officials may revolve around opposition to the access policy, rather than how the project is designed. If so, agency representatives must be prepared to explain in clear and persuasive terms the basis for the policy. A fair and objective review of alternatives proposed by the public is essential to maintaining credibility of the public involvement process.

Seek a clear understanding of public concerns

Create opportunities for people to express their concerns. Position statements, such as "I want a center turn lane and not a median," are not as effective as specific concerns, such as "I don't think I can get delivery trucks in and out of here." In discussions with property owners, talk them through how the project will affect traffic operations in their area. Demonstrate how they will get in and out of their property or neighborhood and how the project will improve safety and operations.

For major projects, consider translating specific interests and objectives into evaluation criteria, which can be used to rank alternatives. Criteria should include the objectives of the agency as well as affected parties. Objectives might include the following:

- Provide convenient access to businesses.
- Minimize through traffic in the neighborhood.
- Avoid median openings across turn or storage lanes.
- Improve pedestrian safety.
- Minimize exceptions from guidelines.
- Provide opportunities for landscaping.

6-Public Involvement

Prove to the public that their concerns will be considered

Make it clear to participants that the project is open to new ideas and that there is a process for considering modifications. Acknowledge the public's role in the decision-making process and show a willingness to modify the project in response to valid public concerns. The challenge is to balance technical solutions and public concerns, while advancing access management principles and project intent. Even when nothing should be done to change the project, it is important to let the public know that their concerns have been considered and the reasons why a better solution could not be found.

Never try to slip a controversial decision past the public

Affected parties will eventually find out about the agency's decisions. The damage to the agency's credibility will be difficult to reverse, and the potential for future retaliation will be high.

Achieve a clear resolution and provide prompt feedback

Nothing is more damaging to the credibility of a process than failure to resolve issues and follow up with participants on decisions made in response to their concerns. Summarize the key recommendations or concerns that were expressed, the official response, and any future opportunities to participate. If additional analysis is called for, it should be completed as soon as possible after meeting with affected parties and obtaining their concerns or comments. Clearly resolve the major issues or concerns. Although consensus is generally unattainable, it is important to achieve some resolution of the issues—even if some remain unsatisfied.

Appendix A: Example Access Management Ordinance for a City

Summary

The following example access management ordinance has been adapted from the actual municipal ordinance of College Station, Texas. College Station's ordinance was determined to be one of the most comprehensive ordinances developed by a city for access management. The adapted code is provided to assist Iowa cities in developing access management ordinances. Although the code does not cover all access treatments discussed in this handbook, it does cover the most-used treatments. Municipalities are urged to tailor the code to meet local needs and develop additional code language as necessary.

Features of the example code include classification of roadways by function and requirements for sight distance, driveway spacing, maximum driveways per lot, corner lot access, corner clearance, shared (joint and cross) access, turn radius, driveway width, driveway throat length, and parking/loading. In summary:

Roadways are classified by the following functional categories:

1. Local streets—streets that provide access to single family residential neighborhoods.
2. Collectors—streets that link Local Streets with the arterial system and serve residential areas primarily internal to one neighborhood.
3. Minor arterials—streets that feed the major arterial system, support moderate length trips, and serve activity centers.
4. Major arterials—streets and highways that provide service to traffic entering and exiting the city and between major activity centers within the city.

Major arterial, minor arterial, and collector streets should be indicated in a thoroughfare plan that maps roadways by their classification.

Driveway spacing is differentiated between drives on the same side and opposite side of the roadway as shown in Table A1:

Appendix A: Example Access Management Ordinance for a City

Table A1—Minimum driveway spacing

Street Classifications	Minimum Adjacent Spacing (feet)	Minimum Opposite Right Spacing (feet)
Local street	150	125
Collector	185	175
Minor arterial	230	225
Major arterial	275	300

Corner clearances must meet the minimum spacing standards for the roadway. When spacing standards cannot be met, additional standards are proposed.

Minimum driveway throat lengths, measured from curb line to first on-site conflict point, are as follows:

- collector—25 feet (approximately two car lengths)
- minor arterial—40 feet
- major arterial—55 feet

Example Municipal Driveway Access Location and Design Ordinance

(1) General

- (a) It shall be unlawful for any person to cut, break, or remove any curb along a street except as herein authorized.
- (b) It shall be unlawful for any person to construct, alter, or extend, or permit or cause to be constructed, altered, or extended any driveway approach which can be used only as a parking space or area between the curb and private property.
- (c) This section shall be deemed to be supplemental to other sections regulating the use of public property, and in case of conflict, this section shall govern.
- (d) Adequate sight distance shall be provided for a passenger motor vehicle making a left or right turn exiting from a driveway. This determination shall be made by the city engineer.

Appendix A: Example Access Management Ordinance for a City

- (e) The specifications and guidelines set forth in this ordinance are to be applied to all roadways and properties that abut these roadways within the city, unless otherwise indicated.
- (f) As determined by the city engineer, engineering judgment shall override the recommended dimensions set forth in this policy if warranted by specific traffic conditions.

(2) Location of Driveway Access

- (a) In making a determination as to the location of driveway access, the city engineer shall consider:
 - (i) The characteristics of the proposed land use;
 - (ii) The existing traffic flow conditions and the future traffic demand anticipated on the development and the adjacent street system;
 - (iii) The location of the property;
 - (iv) The size of the property;
 - (v) The orientation of structures on the site;
 - (vi) The number of driveways needed to accommodate anticipated traffic;
 - (vii) The number and location of driveways on existing adjacent and opposite properties;
 - (viii) The location and carrying capacity of intersections;
 - (ix) The proper geometric design of driveways;
 - (x) The spacing between opposite and adjacent driveways;

Appendix A: Example Access Management Ordinance for a City

- (xi) The internal circulation between driveways; and,
- (xii) The speed of the adjacent roadway.
- (b) Driveway access to arterials shall not be permitted for parking or loading areas that require backing maneuvers in a public street right-of-way. Driveway access to collector streets for commercial or multifamily developments shall not be permitted for parking or loading areas that require backing maneuvers in a public street right-of-way.
- (c) One curb cut shall be allowed for access to single family and duplex residential tracts. More than one curb cut may be allowed upon approval by the city engineer.
- (d) For corner tracts, access to residential tracts shall be provided from the lesser (lowest classification) street. Access notes on plats shall supersede this requirement. The determination as to the lesser (or greater) street shall be based on the functional street classification.
- (e) No cuts through a left turn reservoir of a median shall be permitted in order to provide for left turn movements to driveway approaches.
- (f) Driveways in right turn lane transition areas shall not be permitted.
- (g) When a commercial or multifamily development abuts more than one public street, access to each abutting street may be allowed only if the following criteria are met:
 - (i) It is demonstrated that such access is required to adequately serve driveway volumes and will not be detrimental or unsafe to traffic operations on public streets. The city engineer may require the submittal of a traffic study which demonstrates that such access is required.
 - (ii) The minimum requirements for corner clearance for commercial or multifamily driveways are met.

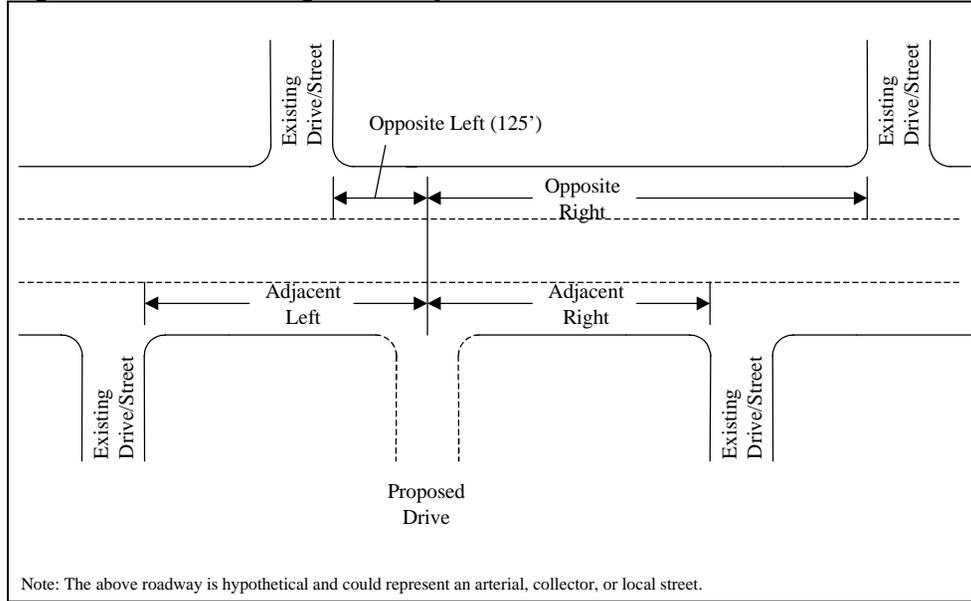
Appendix A: Example Access Management Ordinance for a City

(3) Spacing of Driveway Access

- (a) Application of the driveway access location and design policy requires identification of the functional classification of the street on which access is requested and then applying the appropriate spacing requirements. City streets are classified as follows:
 - (i) Major Arterial;
 - (ii) Minor Arterial;
 - (iii) Collector; and,
 - (iv) Local Street.
- (b) Major arterial, minor arterial, and collector streets in the city are indicated on the Thoroughfare and Transportation Improvement Plan. The functional classification of any street in the city not indicated as an arterial or collector street on this plan shall be determined using the functional street classification defined by the American Association of State Highway and Transportation Officials (AASHTO) “green book,” *A Policy on Geometric Design of Highways and Streets*.
- (c) Driveway access spacing shall be measured from the centerline of the proposed driveway pavement to the nearest edge of the roadway of the adjacent or opposite driveway or street as indicated in Figure A1.

Appendix A: Example Access Management Ordinance for a City

Figure A1—Measuring driveway access



- (d) Opposite Right Driveways shall be located no closer than the minimum requirements of Table A2.

Table A2—Opposite right (downstream) drive spacing

Street Classification	Minimum Spacing (feet)	Desirable Spacing* (feet)
Major Arterial	300	400
Minor Arterial	225	350
Collector	175	300
Local Street	125	225

* Desirable spacing will be required except in older developments with insufficient frontage.

Appendix A: Example Access Management Ordinance for a City

- (e) Additional opposite right spacing over and above that set forth in Table A2 may be required if it is determined by the city engineer or his designee that there is insufficient left turn queue storage or weave maneuver area between the opposite right and proposed driveway. This determination shall be made under peak traffic conditions.
- (f) A minimum of one hundred twenty-five feet (125') shall be required for Opposite Left Drives for all street classifications.
- (g) If the centerline of an opposite drive is less than fifteen feet (15') from the centerline of the proposed drive, the drives form an intersection and the minimum spacing requirements shall apply for the closest drive.
- (h) Adjacent drives shall be located no closer than the minimum requirements of Table A3.

Table A3—Adjacent drive spacing

Street Classification	Minimum Spacing (feet)	Desirable Spacing* (feet)
Major Arterial	275	350
Minor Arterial	230	300
Collector	185	235
Local Street	150	190

* Desirable spacing will be required except in older developments with insufficient frontage.

(4) Corner Clearance

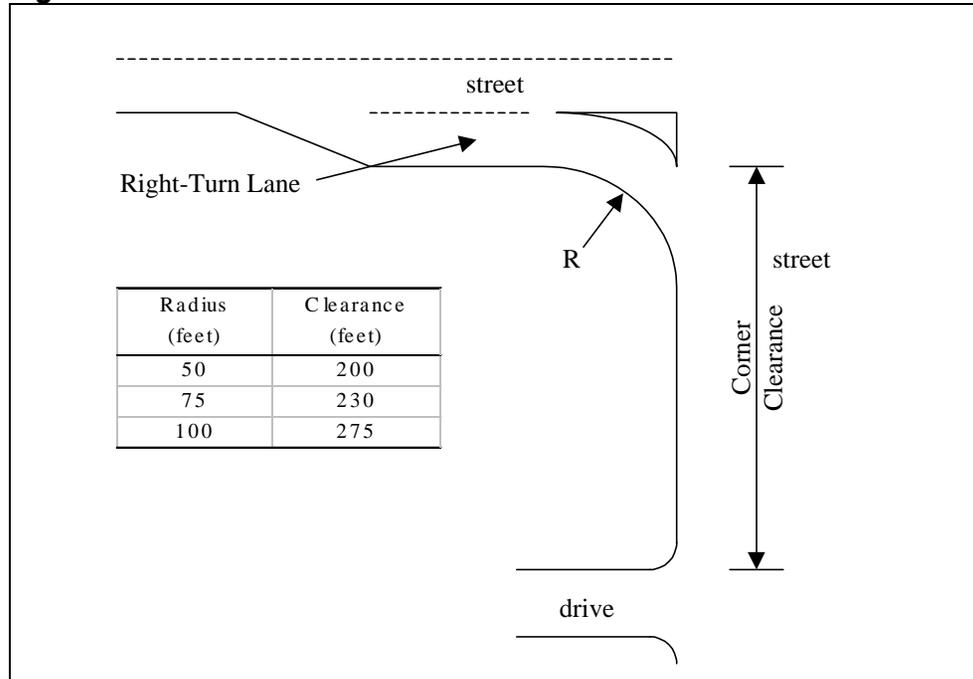
Corner clearance for driveway access shall meet or exceed the minimum driveway spacing requirements for that roadway. When minimum spacing requirements cannot be met due to lack of frontage and all means to acquire shared access drives or cross access easements have been exhausted, the following requirements shall apply.

- (a) At intersections of arterials with channelized right-turn lanes with yield control, a corner clearance distance in accordance with those set forth in Figure A2 shall be required for the first downstream driveway. This distance

Appendix A: Example Access Management Ordinance for a City

shall be measured from the channelized median to the nearest edge of the proposed driveway as indicated in Figure A2.

Figure A2—Downstream corner clearance



- (b) No driveway approach may be located closer to the corner than 30 feet on local streets, 75 feet on collector streets, 100 feet on minor arterials and 120 feet for major arterials. This measurement shall be taken from the intersection of property lines at the corner. When these requirements cannot be met due to lack of frontage, the driveway may be located such that the radius will begin at the farthest property line.

Appendix A: Example Access Management Ordinance for a City

(5) Shared Access

- (a) A joint private access easement may be required between adjacent lots fronting on arterial and collector streets in order to minimize the total number of access points along those streets and to facilitate traffic flow between lots. The location and dimensions of said easement shall be determined by the city engineer.
- (b) Private cross access easements may be required across any lot fronting on an arterial or collector street in order to minimize the number of access points and facilitate access between and across individual lots. The location and dimension of said easement shall be determined by the city engineer.

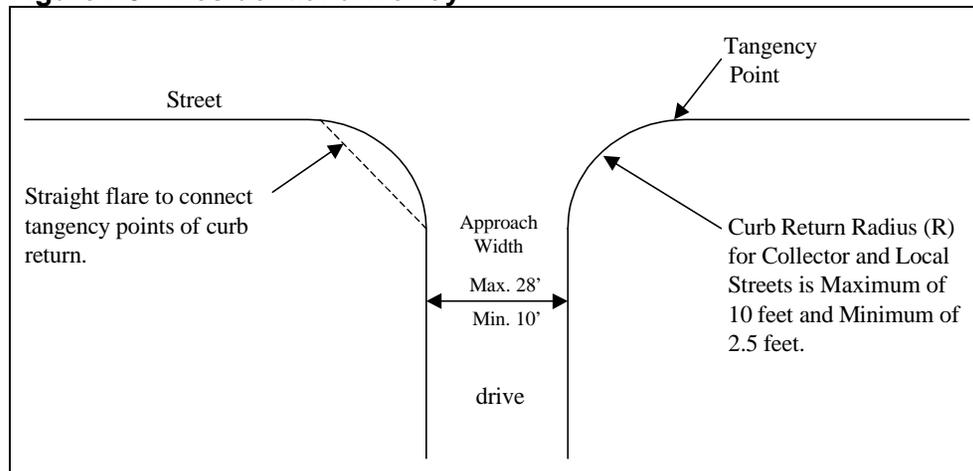
(6) Geometric Design of Driveway Access

- (a) All driveways shall meet the city's standard specifications for street construction and construction standards.
- (b) Curb cuts for driveways shall not be permitted in the curb return of an intersection.
- (c) The curb return radii for driveways intersecting at right angles with the roadway and without a deceleration lane shall be as follows:
 - (i) Curb return radii for residential (single family and duplex) driveways located on local or collector streets shall be between 2.5 feet and 10.0 feet as shown in Figure A3. Flare type residential driveways must also adhere to these dimensional criteria. Residential driveways located on arterial streets must adhere to the specifications set forth in 6(c)(ii).
 - (ii) Curb return radii for commercial and multi-family driveways shall vary between fifteen feet (15') and thirty feet (30') as shown in Figure A4.
 - (iii) Curb return radii for driveway types not included in (i) or (ii) above shall be determined by the city engineer.

Appendix A: Example Access Management Ordinance for a City

- (d) The maximum width of residential driveway approach, shown in Figure A3 and measured at the property line, shall not exceed twenty-eight feet (28') in width, while the minimum width shall not be less than ten feet (10') in width.

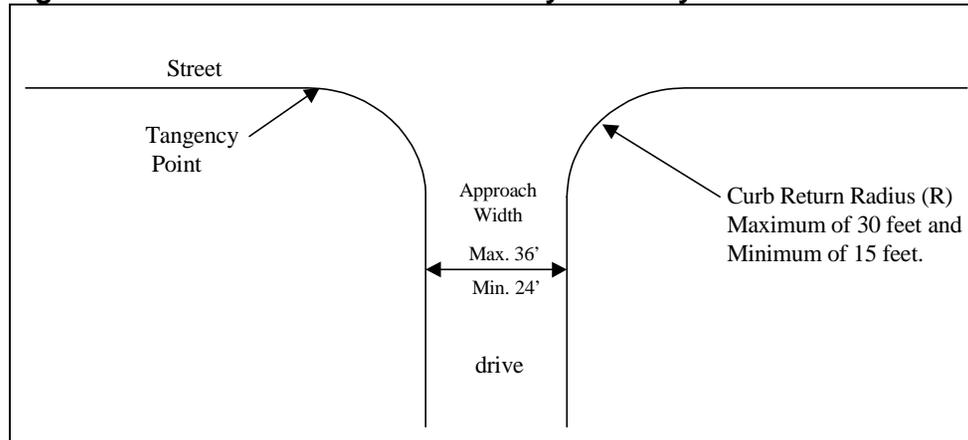
Figure A3—Residential driveway



- (e) The maximum width of a commercial and multi-family driveway approach for two-way operation, shown in Figure A4, shall not exceed thirty-six feet (36') except that the city engineer may issue permits for driveway approaches greater than thirty-six feet (36') in width on major streets to handle special traffic conditions. The minimum width of commercial and multifamily driveway approach for two-way operation shall not be less than twenty-four feet (24').

Appendix A: Example Access Management Ordinance for a City

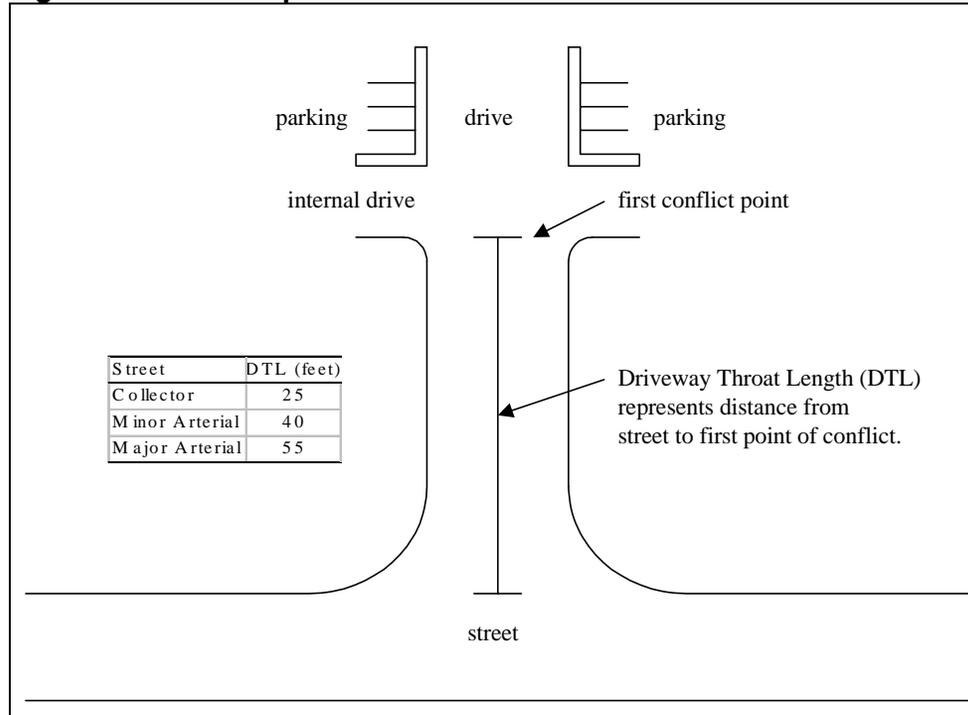
Figure A4—Commercial and multifamily driveway



- (f) The combination of two driveways for residential circular drives shall not exceed twenty-eight feet (28').
- (g) The angle of driveway approach shall be approximately ninety degrees (90°) for two (2) way drives and between forty-five degrees (45°) and ninety degrees (90°) degrees for one way drives.
- (h) A minimum driveway throat length of twenty-five feet (25') for collector streets, forty feet (40') for minor arterials, and fifty-five feet (55') for major arterials, as shown in Figure A5, may be required to allow for traffic entering the site to be stored on site in order to avoid a queue of traffic from the development from being out on the roadway causing delays to the through traffic stream. The driveway throat length shall be defined as the distance from the street to the first point of conflict in the driveway.
- (i) For the benefit of traffic safety and flow on collector and arterial streets, access points may be required to be designed to prohibit certain types of turning movements (for example, left turns). Driveways not meeting the spacing guidelines in Tables A2 and A3 may be designed for limited access by the addition of a median to the driveway.

Appendix A: Example Access Management Ordinance for a City

Figure A5—Access points



- (j) For the benefit of traffic safety and flow on collector and arterial streets, tapered or channelized deceleration lanes for vehicles turning right into high volume or intersection type driveways may be required if warranted. Design of right-turn deceleration lanes shall be in accordance with the AASHTO *Green Book* on auxiliary lanes.
- (i) The spacing requirements for driveways not meeting the specifications in Tables A2 and A3 may be lessened or waived if tapered or channelized deceleration lanes are used.

Appendix A: Example Access Management Ordinance for a City

- (k) Access points on arterial and collector streets may be required to be signalized in order to provide safe and efficient traffic flow. A development may be responsible for all or part of any right-of-way, design, hardware, and construction costs of a traffic signal if it is determined that the signal is necessitated by the traffic generated from the development. The procedures for signal installation and the percent of financial participation required of the development in the installation of the signal shall be in accordance with criteria set forth in the city's traffic signal policy

(7) Street Structures

No driveway shall interfere with municipal facilities such as street light or traffic signal poles, signs, fire hydrants, cross walks, bus loading zones, utility poles, fire alarm supports, drainage structures, or other necessary street structures. The city engineer is authorized to order and effect the removal or reconstruction of any driveway which is constructed in conflict with street structures. The cost of reconstructing or relocating such driveways shall be at the expense of the abutting property owner.

(8) Permits

- (a) Any plans submitted for building approval which include or involve driveways shall be referred to the city engineer for approval before a building permit is issued.
- (b) A written driveway permit for a new development shall be not issued or required. Approval of driveway location and design for new properties and other developments on a building plan or site plan shall be considered the permit for driveway installation.
- (c) Any property owner desiring a new driveway or an improvement to an existing driveway at an existing residential or other property shall make application for a driveway permit, in writing, and designating the contractor who will do the work, to the city engineer or the building supervisor, accompanied by a sketch or drawing showing clearly the driveway, parking area, or doorway to be connected and the location of the nearest existing driveways on the same and opposite sides of the roadway. The city engineer will prescribe the construction procedure to be followed.

Appendix A: Example Access Management Ordinance for a City

- (d) A permit or building/site plan approval as per the procedure of either 8(b) or 8(c) shall be required for the location of all driveways which provide for access to property. Driveway permits will also be required for any significant structure change, land use change, or property boundary change.
- (e) The driveway permit fee shall be set by resolution of the city council as deemed appropriate by the council and shall be of an amount to cover the cost of licensing and maintaining records.
- (f) All permits granted for the use of public property under the terms of this section shall be revocable at the will of the city council.

Appendix B: Example Access Management Ordinance for a County

Summary

The following example access management ordinance has been adapted from the actual county ordinance of Washington County, Oregon. Washington County's ordinance was determined to be one of the most comprehensive ordinances developed by a county for access management. The adapted code is provided to assist Iowa counties in developing access management ordinances. It contains code pertaining to several primary components of access management, including classification of roadways by function and requirements for driveway spacing, corner clearance and sight distance. Key components are summarized as follows:

Roadways are classified according to the following categories:

1. Local roads—provide direct property access; do not serve through traffic.
2. Minor collectors—provide access to abutting properties and serve local access needs of neighborhoods and limited through traffic.
3. Major collectors—serve traffic traveling from local roads or minor collectors to arterials; are public thoroughfares with a lesser degree of traffic than arterials.
4. Minor arterials—serve as primary routes for travel within and between community sub-areas and augment the major arterial system; accessed primarily from the collector system.
5. Major arterials—serve as primary routes for travel between areas of principal traffic generation and major urban activity centers, and for trips between non-adjacent areas.
6. Regional arterials—freeways and principal routes that move traffic and do not provide direct access to land use activities.

Land access is permitted based on driveway spacing and corner clearance requirements as shown in Table A4.

Appendix B: Example Access Management Ordinance for a County

Table A4—Driveway spacing and corner clearance requirements

Roadway Category	Permitted Access	Driveway Spacing	Corner Clearance ⁽¹⁾ (feet)
Local	All properties	No standards	10 feet
Minor collector	All residential, commercial & industrial uses, greater than or equal to 70 feet frontage ⁽²⁾	No standards	50 feet
Major collector	All commercial, industrial, and institutional uses, greater than 150 feet frontage ⁽³⁾	100 feet	100 feet
Minor collector	Collector roads and private direct access	600 feet	600 feet
Major arterial	Collectors, minor arterials, and private direct access	1,000 feet	1,000 feet
Principal/regional arterial	Limited access subject to Iowa DOT policy	(These roads fall under Iowa DOT jurisdiction)	

(1) Access near an intersection shall be located beyond the influence of standing queues; this requirement may result in a greater corner clearance than the minimum distance indicated.

(2) Uses with less than 70 feet of frontage shall not be permitted a permanent single or separate access; common (joint) access shall be used where available.

(3) Uses with less than 150 feet of frontage shall not be permitted a permanent single or separate access; common (joint) access shall be used where available.

Minimum intersection sight distance shall be ten times the vehicular speed of the road (that is, 350 feet at 35 miles per hour, 400 feet at 40 miles per hour). The vehicular speed for sight distance determination shall be the greater of the design speed or the posted speed, unless the county determines that the 85th percentile speed is less.

Example Access Management Ordinance for a County

All developments shall have legal access to a county or public road. Access onto any county road in the unincorporated or incorporated urban area shall be permitted only upon issuance of an access permit upon demonstration of compliance with the provisions of the county road standards.

A. Roadway Access

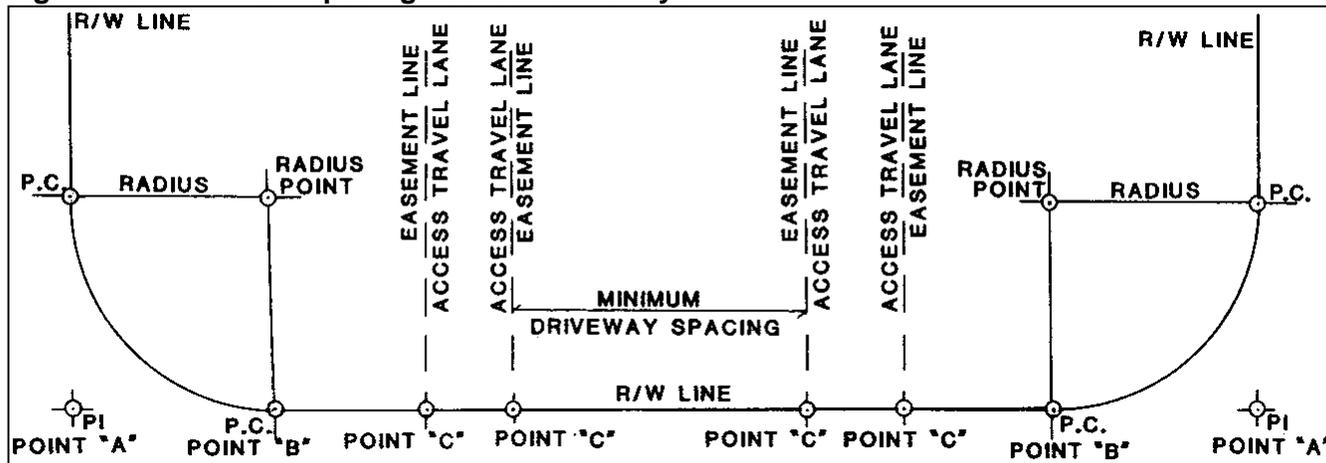
In Figure A6, R/W = Right-of-Way, and P.I. = Point-of-Intersection where P.I. shall be located based upon a 90 degree angle of intersection between ultimate right-of-way lines.

(1) Minimum right-of-way radius at Intersections shall conform to the county road standards.

Appendix B: Example Access Management Ordinance for a County

- (2) All minimum distances stated in the following sections shall be governed by sight distance requirements according to county road standards.
- (3) All minimum distances stated in the following sections shall be measured to the nearest easement line of the access or edge of travel lane of the access on both sides of the road.
- (4) All minimum distances between accesses shall be measured from existing or approved accesses on both sides of the road.
- (5) Minimum spacing between driveways shall be measured from Point “C” to Point “C” as shown in Figure A6.

Figure A6—Minimum spacing between driveways



B. Roadway Access

No use will be permitted to have direct access to a road except as specified below. Access spacing shall be measured from existing or approved accesses on either side of the road.

Appendix B: Example Access Management Ordinance for a County

(1) Local Roads

Minimum right-of-way radius is fifteen (15) feet. Access will not be permitted within ten (10) feet of Point “B,” if no radius exists, access will not be permitted within twenty-five (25) feet of Point “A.” Access points near an intersection with a major collector or arterial shall be located beyond the influence of standing queues of the intersection in accordance with AASHTO standards. This requirement may result in an access spacing greater than ten (10) feet.

(2) Minor Collectors

All residential, commercial and industrial uses with seventy (70) feet or more of frontage will be permitted direct access to a minor collector. Uses with less than seventy (70) feet of frontage shall not be permitted a permanent single or separate direct access to a minor collector. Where a common access is available it shall be used, provided that such use will not result in serious operational or safety problems.

No use will be permitted direct access to a minor collector within fifty (50) feet of Point “A”; or future “P.I.” as designated in the Transportation Plan. In the case of a private minor collector which is entirely within a development, double aisle parking areas will be permitted direct access to that collector. Minimum spacing between driveways (Point “C” to Point “C”) shall be fifty (50) feet with the exception of single family residential lots in a recorded subdivision. Such lots shall not be subject to a minimum spacing requirement between driveways (Point “C” to Point “C”). In all instances, access points near an intersection with a major collector or arterial shall be located beyond the influence of standing queues of the intersection in accordance with AASHTO standards. This requirement may result in an access spacing greater than fifty (50) feet.

(3) Major Collectors

All commercial, industrial and institutional uses with one-hundred-fifty (150) feet or more of frontage will be permitted direct access to a major collector. Uses with less than one-hundred-fifty (150) feet of frontage shall not be permitted direct access to major collectors. Where a common access is available it shall be used, provided that

Appendix B: Example Access Management Ordinance for a County

such use will not result in serious operational or safety problems. No use will be permitted direct access to a major collector within one-hundred (100) feet of any present Point “A”; or future “P.I.” as designated in the Transportation Plan. In the case of a private major collector which is entirely within a single development and which provides circulation only within that development, double aisle parking areas will be permitted access to that collector. Minimum spacing between driveways (Point “C” to Point “C”) shall be one-hundred (100) feet. In all instances, access points near an intersection with a major collector or arterial shall be located beyond the influence of standing queues of the intersection in accordance with AASHTO standards. Additionally, access shall be located to provide adequate left-turn refuge. This requirement may result in an access spacing greater than one hundred (100) feet.

(4) Arterials

Direct access to arterial roads shall be from collector or other arterial roads. Exceptions for local roads and private accesses may be allowed when collector access is found to be unavailable and impracticable by the county. Access to arterials shall comply with the following standards:

(a) Minor Arterials

Direct access to a minor arterial will be permitted provided that Point “A” of such access is more than six hundred (600) feet from any intersection (Point “A”) or other access to that minor arterial (Point “C”).

(b) Major Arterials

Direct access to a major arterial will be permitted provided that such access is more than one thousand (1,000) feet from any intersection (Point “A”) or other access to that arterial (Point “C”).

(c) Principal/Regional Arterials

Appendix B: Example Access Management Ordinance for a County

Principal/Regional Arterials shall be designed and developed as limited access facilities. Access to a principal or regional arterial is subject to approval by the Iowa DOT through the state's access management policy and its implementing measures.

C. Exception to Access Criteria

- (1) Alternate points of access may be allowed if an access management plan which maintains the classified function and integrity of the applicable facility is reviewed and approved after considering the applicant's compliance with this Article.
- (2) An application for an access management plan shall explain the need for the modification and demonstrate that the modification maintains the classified function and integrity of the facility. References to standards or publications used to prepare the access management application shall be included with the application.
- (3) An access management plan shall address the safety and operational problems which would be encountered should a modification to the access spacing standards be granted. An access management plan shall be prepared and certified by a traffic or civil engineer registered in the State of Iowa. An access management plan shall at minimum contain the following:
 - (a) The minimum study area shall include the length of the site's frontage plus the distance of the applicable access spacing standard, as set forth in Section B, measured from the property lines or access point(s), whichever is greater. For example, a property with 500 feet of frontage on a minor arterial (required 600 foot access spacing standard) shall have a minimum study area which is 1,700 feet in length.
 - (b) The access management plan shall address the potential safety and operational problems associated with the proposed access point. The access management plan shall review both existing and future access for all properties within the study area as defined above.
 - (c) The access management plan shall include a comparison of all alternatives examined. At a minimum, the access management plan shall evaluate the proposed modification to the access spacing standard and the

Appendix B: Example Access Management Ordinance for a County

impacts of a plan utilizing the county standard for access spacing. Specifically, the access management plan shall identify any impacts on the operations and/or safety of the various alternatives.

- (d) The access management plan shall include a list of improvements and recommendations necessary to implement the proposed access modification, specifically addressing all safety and operational concerns identified.
- (4) Notice for a proposed access management plan shall include all property owners within the study area defined in this section.

D. Sight Distance

The following specifies the minimum requirements for sight distance for roads intersecting each other and for driveways intersecting public roads. It is the intent of this section to regulate the creation of new access points and new lots or parcels and development in the county in a manner that will insure that each new access point or each new lot or parcel created or development will have a safe access to a public road.

- (1) Existing access points which do not meet the sight distance standards and are on property included with a development action which will not add any additional vehicle trips to that access are exempt from this Section, except as required by county road standards. Improvements at these existing access points may be required to maximize sight distance to the extent practicable by the county through an access permit or right-of-way permit.
- (2) The minimum intersection sight distance shall be based on the vehicular speeds of the road. The vehicular speeds for the purpose of determining intersectional sight distance shall be the greater of the following unless the eighty-five percentile speed is determined to be less by the county pursuant to the standards of this Section.
 - (a) Design speed—a speed selected by a registered engineer for purposes of design and correlation of those features of a road, such as curvature, superelevation, and sight distance, upon which the safe operation of vehicles is dependent.

Appendix B: Example Access Management Ordinance for a County

- (b) Posted speed—that speed which has been established and posted by the county.
 - (c) Eighty-five percentile speed—that speed as certified by a registered engineer below which 85 percent of all traffic units travel, and above which 15 percent travel. The eighty-fifth percentile speed shall be measured at the point where the sight restriction occurs.
- (3) Intersection sight distance shall
- (a) be based on an eye height of 3.5 feet and an object height of 4.25 feet above the road and
 - (b) be assumed to be 10 feet from the near edge of pavement or the extended curb line or the near edge of the graveled surface of a gravel road to the front of a stopped vehicle.
- (4) Minimum intersection sight distance shall be equal to ten (10) times the vehicular speed of the road as determined by the standards of this Section such as in Table A5.

Table A5—Intersection sight distance

Speed (mph)	Distance along Crossroad (feet)
25	250
30	300
35	350
40	400
45	450
50	500
55	550

- (5) Intersection sight distance values shall conform with (3) above. For significant road improvement projects, the above intersectional standards shall be met in addition to the AASHTO remaining sight distance standards.

Appendix B: Example Access Management Ordinance for a County

- (6) In those instances where there are no access locations available to the site that meet or can meet the sight distance requirements, a written request for modification may be submitted to the county. The request for modification shall be specifically stated in the notice for the accompanying development permit and shall be considered as part of said development permit. The request for modification of the sight distance requirements shall be subject to the following:
- (a) Submitted and certified by a registered engineer;
 - (b) Documented and reference nationally accepted specifications or standards;
 - (c) Certified that the modification will not compromise safety or the intent of the county's transportation standards;
 - (d) The cost of any modifications agreed to must be borne by the applicant; and
 - (e) There shall be no location available to provide access to the proposed development site which currently meets the sight distance requirements, or which can be altered to meet the sight distance requirements. Alterations needed to provide adequate sight distance include but are not limited to grading and the removal of vegetation. For the purpose of this subsection alternative access location means:
 - (i) Any location on the proposed development site which meets or can meet the sight distance requirements; or
 - (ii) Any location off the proposed development site that
 - can provide access to the site by an existing access easement or through an access easement which will be provided to the site as part of the development application and
 - meets or can meet the sight distance requirements.

Appendix B: Example Access Management Ordinance for a County

E. Road Standards

- (1) All roads proposed to be of public ownership shall conform to the county road standards.
- (2) All proposed curve radii shall be designed to county road standards for truck-turning requirements.

Appendix C: Iowa Code Relevant to Access Management

Summary

Appendix C contains excerpts from two state documents pertaining to access management in Iowa: (1) Code of Iowa, 1997 Chapter 306A, and (2) the Iowa Primary Road Access Management Policy, July 1995. Chapter 306A of the Code of Iowa grants the authority to the Iowa DOT to control access on and acquire access rights to the state's highways. The Iowa Primary Road Access Management Policy implements Chapter 306A through rules and regulations promulgated by the Iowa DOT. These documents are provided to show what Iowa law allows in terms of access management and how the Iowa DOT manages access on state highways.

Local officials should refer to the actual Code of Iowa and consult with their agency's attorney when seeking legal advice.

Code of Iowa, 1997: Chapter 306A

306A.1 Declaration of policy.

The legislature hereby finds, determines, and declares that this chapter is necessary for the immediate preservation of the public peace, health, and safety, and for the promotion of the general welfare.

306A.2 Definition of a controlled-access facility.

For the purposes of this chapter, a controlled-access facility is defined as a highway or street especially designed for through traffic, and over, from or to which owners or occupants of abutting land or other persons have no right or easement or only a controlled right or easement of access, light, air, or view by reason of the fact that their property abuts upon such controlled-access facility or for any other reason. Such highways or streets may be freeways open to use by all customary forms of street and highway traffic or they may be parkways from which trucks, buses, and other commercial vehicles shall be excluded.

306A.3 Authority to establish controlled-access facilities---utility accommodation policy.

Cities and highway authorities having jurisdiction and control over the highways of the state, as provided by chapter 306, acting alone or in cooperation with each other or with any federal, state, or local agency or any other state having authority to participate in the construction and maintenance of highways, are authorized to plan, designate, establish, regulate, vacate, alter, improve, maintain, and provide controlled-access facilities for public use if traffic conditions, present or future, will justify special facilities; provided, that within a city such authority shall be subject to municipal consent as may be provided by law. In addition to the specific powers granted in this chapter, cities and highway authorities shall have any additional authority vested in them relative to highways or streets within their respective jurisdictions. Cities and highway authorities may regulate, restrict, or prohibit the use of controlled-access facilities by various classes of vehicles or traffic in a manner consistent with section 306A.2.

Appendix C: Iowa Code Relevant to Access Management

The department shall adopt rules, pursuant to chapter 17A, embodying a utility accommodation policy which imposes reasonable restrictions on placements occurring on or after the effective date of the rules, on primary road rights-of-way. The rules may require utilities to give notice to the department prior to installation of a utility system on a primary road right-of-way and obtain prior permission from the department for the proposed installation. The rules shall recognize emergency situations and the need for immediate installation of service extensions subject to the standards adopted by the department and the utilities board. The rules shall be no less stringent than the standards adopted by the utilities board pursuant to chapters 478, 479, 479A, and 479B. This paragraph shall not be construed as granting the department authority which has been expressly granted to the utilities board to determine the route of utility installations. If the department requires a utility company permit, the department shall be required to act upon the permit application within thirty days of its filing. In cases of federal-aid highway projects on nonprimary highways, the local authority with jurisdiction over the highway and the department shall comply with all federal regulations and statutes regarding utility accommodation.

306A.4 Design of controlled-access facility.

Cities and highway authorities having jurisdiction and control over the highways of the state, as provided by chapter 306, are authorized to so design any controlled-access facility and to so regulate, restrict, or prohibit access as to best serve the traffic for which such facility is intended. In this connection such cities and highway authorities are authorized to divide and separate any controlled-access facility into separate roadways by the construction of raised curbs, central dividing sections, or other physical separations, or by designating such separate roadways by signs, markers, stripes, and other devices. No person shall have any right of ingress or egress to, from, or across controlled-access facilities to or from abutting lands, except at such designated points at which access may be permitted, upon such terms and conditions as may be specified from time to time.

306A.5 Acquisition of property and property rights.

For the purposes of this chapter, cities and highway authorities having jurisdiction and control over the highways of the state, as provided by chapter 306, may acquire private or public property rights for controlled-access facilities and service roads, including rights of access, air, view, and light, by gift, devise, purchase, or condemnation in the same manner as such units are authorized by law to acquire such property or property rights in connection with highways and streets within their respective jurisdictions. All property rights acquired under this chapter shall be in fee simple. In connection with the acquisition of property or property rights for a controlled-access facility or portion of, or service road in connection with a controlled-access facility, the cities and highway authorities, in their discretion, may acquire an entire lot, block, or tract of land, if by so doing the interests of the public will be best served, even though the entire lot, block, or tract is not immediately needed for the right of way proper.

Appendix C: Iowa Code Relevant to Access Management

No access rights to any highway shall be acquired by any authority having jurisdiction and control over the highways of this state by adverse possession or prescriptive right. No action heretofore or hereafter taken by any such authority shall form the basis for any claim of adverse possession of, or prescriptive right to any access rights by any such authority.

306A.6 New and existing facilities---grade-crossing eliminations.

Cities and highway authorities having jurisdiction and control over the highways of the state, as provided by chapter 306 may designate and establish an existing street or highway as included within a controlled-access facility. The state or any of its subdivisions shall have authority to provide for the elimination of intersections at grade of controlled-access facilities with existing state and county roads, and city or village streets, by grade separation or service road, or by closing off such roads and streets at the right of way boundary line of such controlled-access facility, the provisions of sections 306.11 to 306.17 shall apply and govern the procedure for the closing of such road or street and the method of ascertaining damages sustained by any person as a consequence of such closing, provided, however, that the highway authority desiring the closing of such road or street shall conduct the hearing and carry out the procedure therefor and pay any damages, including any allowed on appeal, as a consequence thereof, any law to the contrary notwithstanding, and after the establishment of any controlled-access facility, no highway or street which is not part of said facility shall intersect the same at grade. No city or village street, county or state highway, or other public way shall be opened into or connected with any such controlled-access facility without the consent and previous approval of the highway authority in the state, county, city or village having jurisdiction over such controlled-access facility. Such consent and approval shall be given only if the public interest shall be served thereby.

306A.7 Authority of local units to consent.

Cities and highway authorities having jurisdiction and control over the highways of the state, as provided by chapter 306 are authorized to enter into agreements with each other, or with the federal government, respecting the financing, planning, establishment, improvement, maintenance, use, regulation, or vacation of controlled-access facilities or other public ways in their respective jurisdictions, to facilitate the purposes of this chapter.

306A.8 Local service roads.

In connection with the development of any controlled-access facility cities and highway authorities having jurisdiction and control over the highways of the state, as provided by chapter 306, are authorized to plan, designate, establish, use, regulate, alter, improve, maintain, and vacate local service roads and streets or to designate as local service roads and streets any existing road or street, and to exercise jurisdiction over service roads in the same manner as is authorized over controlled-access facilities under the terms of this chapter, if, in their opinion, such local service roads and streets are necessary or desirable. Such local service roads or streets shall be

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of appropriate design, and shall be separated from the controlled-access facility proper by means of all devices designated as necessary or desirable by the proper authority.

306A.9

Repealed by 65 Acts, ch 259, § 1. See § 321.366.

306A.10 Notice to relocate--costs paid.

Whenever the state department of transportation, city or county determines that relocation or removal of any utility facility now located in, over, along, or under any highway or street, is necessitated by the construction of a project on routes of the national system of interstate and defense highways including extensions within cities or on streets or highways resulting from interstate substitutions in a qualified metropolitan area under title 23, U.S.C., the utility owning or operating the facility shall relocate or remove the same in accordance with statutory notice. The costs of relocation or removal, including the costs of installation in a new location, shall be ascertained by the authority having jurisdiction over the project or as determined in condemnation proceedings for such purposes and may be paid from participating federal aid or other funds.

306A.11 What costs included.

Cost of relocation or removal shall include the entire amount paid by such utility properly attributable to such relocation or removal except the cost of land or any rights or interest in land, after deducting therefrom any increase in the value of the new facility and any salvage value derived from the old facility.

306A.12 Limitation on reimbursement.

A reimbursement shall not be made for any relocation or removal of facilities under this chapter unless funds to be provided by federal aid amount to at least eighty-five percent of each reimbursement payment.

306A.13 Definition.

The term "utility" shall include all privately, publicly, municipally or co-operatively owned systems for supplying water, sewer, electric lights, street lights and traffic lights, gas, power, telegraph, telephone, transit, pipeline, heating plants, railroads and bridges, or the like service to the public or any part thereof if such system be authorized by law to use the streets or highways for the location of its facilities.

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Iowa Primary Road Access Management Policy, July 1995

761--112.1(306A) STATEMENT OF POLICY.

The efficiency and safety of a highway depend to a large extent upon the amount and character of interruptions to the movement of traffic. The primary cause of these interruptions is vehicular movements to and from businesses, residences, and other developments along the highway. Regulation and overall control of highway access are necessary to provide efficient and safe highway operation and to utilize the full potential of the highway investment.

Accordingly, the department hereby establishes rules for control of access to primary roads.

112.1(1) When applying these rules to a particular access situation, the department shall consider the following:

- (a) Safety to the traveling public.
- (b) Perpetuation of the traffic-carrying capacity of the highway.
- (c) The impact upon the economy of the state.
- (d) Protection of the rights of the traveling public and of property owners, including the rights of abutting property owners.

112.1(2) The department reserves the right to make exceptions to these rules where the exercise of sound and reasonable judgment indicates that the literal enforcement of the rules would cause an undue hardship to any interested party, the community or the state.

761--112.2(306A) DEFINITIONS.

The following terms, when used in this chapter of rules, shall have the following meanings unless the context otherwise requires:

112.2(1) **Access.** A means of ingress or egress between a primary highway and abutting property or an intersecting local public road or street.

112.2(2) **Acquisition.** To receive title by gift, purchase or condemnation.

112.2(3) **Built-up area.** An area adjacent to a primary road that meets the following general criteria:

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- (a) The lots or area abutting the primary road does not have sufficient setback for the construction of a frontage road, and the development in depth precludes the establishment of a frontage-type road to the rear of the lots or area.
- (b) When a “built-up area” exists on one side of a primary road, the other side of the road is also considered to be “built-up” for the purpose of determining access requirements.

112.2(4) **Controlled access highway.** All primary highways are controlled access facilities.

112.2(5) **Department.** The Iowa department of transportation. Information and forms regarding primary road access control may be obtained from:

- (a) Maintenance Division, Iowa Department of Transportation, 800 Lincoln Way, Ames, Iowa 50010; telephone 515-239-1197.
- (b) The resident construction engineer, resident maintenance engineer or transportation center maintenance engineer assigned to the geographical area in which these rules are being applied to a particular access situation.

112.2(6) **Entrance.** A physical connection between a primary highway and abutting property or an intersecting local public road or street.

112.2(7) **Entrance type.** Entrances are divided into the following three classes according to their normal usage:

- (a) Type “A” entrance. An entrance developed to carry sporadic or continuous heavy concentrations of traffic. An entrance of this type would normally consist of multiple approach lanes and may incorporate a median. Possible examples: race tracks, large industrial plants, shopping centers, subdivisions, or amusement parks.
- (b) Type “B” entrance. An entrance developed to serve moderate traffic volumes. An entrance of this type would normally consist of one inbound and one outbound traffic lane. Possible examples: service stations, small businesses, drive-in banks, or light industrial plants.
- (c) Type “C” entrance. An entrance developed to serve light traffic volumes. The entrance would not normally accommodate simultaneous inbound and outbound vehicles. Possible examples: residential, farm or field entrances.

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112.2(8) **Entrance width determination.**

- (a) The width of an entrance with a radius return or with a flared taper within an urban-designed area shall be measured at a point 9.84 feet back from the primary highway curb. The curb opening may exceed the maximum allowable width of the entrance to accommodate the allowable radius or taper.
- (b) Entrance width within a rural-designed area shall be measured across the top of the entrance at the culvert line or at the location where a culvert would normally be placed.

112.2(9) **Fringe area.** A suburban-type area adjacent to a primary road that meets the following general criterion: The layout of the lots or area abutting the primary road, including intermittent or unrelated development, permits construction of a frontage road in front of, or a frontage-type road to the rear of, the development.

112.2(10) **Frontage.** The length along public road right-of-way of a single property tract. Corner property at an intersection of two public roads has separate frontage along each roadway.

112.2(11) **Frontage road.** A public road or street auxiliary to and usually located alongside and parallel to a primary highway for maintaining local road continuity and for control of access.

112.2(12) **Median.** The portion of a divided highway or divided entrance separating the traveled ways from opposing traffic. Medians may be depressed, raised or painted. Openings in the primary highway median to accommodate entrances are governed by the following:

- (a) New median openings should not be permitted except to accommodate intersecting local public roads or streets or large traffic generating facilities such as large shopping centers or industrial plants. Median openings may be permitted in these instances if satisfactorily justified and in the public interest.
- (b) If a median opening exists prior to the construction of a driveway or local public road or street, the opening may be modified to accommodate the turning movements of the traffic expected.
- (c) Costs incurred for adding or modifying median openings shall not be borne by the department.
- (d) The department reserves the right to close an existing median opening when the department deems it is necessary.

112.2(13) **Normal peak hour traffic.** The number of vehicles, based on the 30th highest hour, found to be entering and leaving an entrance during 60 consecutive minutes, excluding holidays.

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112.2(14) **Predetermined access location.** A location of access reserved for the adjacent property at the time access rights are acquired.

112.2(15) **Primary road or primary highway.** A road or street designated as a "primary road" in accordance with Iowa Code subsection 306.3(8). This definition includes primary road extensions in municipalities.

112.2(16) **Priority I highway.** A primary highway constructed as a fully controlled access facility. Access to the facility is allowed only at interchange locations.

112.2(17) **Priority II highway.** A primary highway constructed as a four-lane divided facility with a high degree of access control. Access to the facility is allowed only at interchanges and selected at-grade locations.

The minimum allowable spacing between access locations is 2,624 feet. Limiting primary highway access to existing public road intersections at intervals of 5,248 feet is preferable.

112.2(18) **Priority III highway.** A primary highway constructed as a two-lane facility, a two-lane facility within a four-lane right-of-way corridor, or a four-lane facility. Access to the facility is allowed at interchanges and at-grade locations.

The minimum allowable spacing between access locations is 984 feet in a rural-designed area and 656 feet in an urban-designed area. In a rural-designed area, spacing of 1,312 feet is preferable.

112.2(19) **Priority IV highway.** A primary highway constructed as a two-lane facility; however, the definition may include a four-lane facility in an urban area.

The minimum allowable spacing between access locations is 656 feet in a rural-designed area and 328 feet in an urban-designed area.

112.2(20) **Priority V highway.** A primary highway where access rights to it were acquired between 1956 and 1966, entrances were reserved at that time with no spacing limitations, and the department has subsequently determined that a higher degree of access control is desirable. The definition also includes a highway where access rights have not been acquired, but the department anticipates acquiring access rights in the future.

Entrances to the highway are generally restricted to one entrance for contiguous highway frontage not exceeding 984 feet, two entrances for contiguous highway frontage exceeding 984 feet but not exceeding 1,968 feet, and so on.

112.2(21) **Priority VI highway.** A primary highway where the acquisition of access rights or additional access rights is not anticipated. This definition may also include a highway where access rights were acquired between 1956 and 1966,

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entrances were reserved at that time with no spacing limitations, and the department has subsequently determined that restricting access to the facility is no longer necessary.

Access locations are approved based on safety and need.

112.2(22) **Ramp bifurcation.** The point where the baseline of the ramp intersects the centerline of the adjacent roadway.

112.2(23) **Recreational trail.** A trail established in conjunction with minimum AASHTO standards. A recreational trail may be established for biking, pedestrian, snowmobiling, cross-country skiing, or equestrian use.

112.2(24) **Right-of-way line.** The boundary line between the land acquired for or dedicated to public road use and the adjacent property.

112.2(25) **Rural area.** An area clearly not meeting the criteria set forth for a built-up or fringe area; rural area also includes agricultural land within the corporate limits of a city.

112.2(26) **Rural-designed area.** An area in which the predominant cross section accommodates surface drainage from the roadway and adjacent terrain via an open ditch.

112.2(27) **Shoulder.** The portion of a public road contiguous to the traveled way for the accommodation of disabled vehicles and for emergency use.

112.2(28) **Sight distance.** The distance of clear vision along a primary highway in each direction from any given point of access where a vehicle must stop before entering the highway.

- (a) Sight distance is based upon AASHTO stopping sight distance criteria. However, the height of an object is increased from 0.492 to 4.264 feet to acknowledge an approaching vehicle as the “object” of concern. Therefore, sight distance at an access location is measured from the driver's height of eye (3.5096 feet) to the height of an approaching vehicle (4.264 feet).
- (b) An access location should be established where desirable sight distance is available and shall not be authorized in a location providing less than minimum sight distance, as shown below.

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Posted Daytime Speed Limit (mph)	Desirable Sight Distance (feet)	Minimum Sight Distance (feet)
60	852.8	656
55	721.6	557.6
50	656	492
45	557.6	393.6
40	492	328
35	393.6	262.4
30	328	196.8

(c) On a four-lane divided primary highway where access is proposed at a location not to be served by a median crossover, sight distance shall be required only in the direction of the flow of traffic.

112.2(29) **Special access connection.** An access location authorized to the primary road system in an area where access rights were previously acquired. Special access connections shall be constructed in compliance with the rules for entrances.

112.2(30) **Turning lane.** An auxiliary lane, including taper areas, primarily for the deceleration or storage of vehicles leaving the through traffic lanes.

112.2(31) **Urban-designed area.** A built-up or fringe area in which the predominant cross section accommodates roadway surface drainage by means of a curbed roadway.

761--112.3(306A) GENERAL REQUIREMENTS FOR CONTROL OF ACCESS.

112.3(1) **Establishment of controlled access highway.** Access locations necessary for free and convenient access that exist at the time a primary highway is established are hereby approved if the department deems they are reasonably located.

112.3(2) **Frontage roads.** If a frontage road is open to public travel, access from the abutting property shall be to the frontage road.

(a) Access to frontage roads maintained by the department shall be authorized in accordance with rules 112.4(306A), 112.8(306A) and 112.9(306A).

(b) Access to frontage roads maintained by other governmental agencies shall conform to those agencies' access requirements.

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112.3(3) Enforcement of access control.

- (a) Fences. The department may construct and maintain fences or other appropriate physical separations within the primary highway right-of-way to effectively enforce and control access to the highway.
- (b) Unauthorized construction or modification of entrances. If an entrance is constructed or altered without the approval of the department or if the work is not completed in conformity with an approved permit or agreement, the department may notify the owner by certified mail of the violation and the need to restore the area to the standards which existed immediately prior to construction or alteration or advise of the changes necessary to conform. If after 20 days the changes have not been made, the department may make the necessary changes and immediately send a statement of the cost to the property owner. If within 30 days after sending the statement the cost is not paid, the department may institute proceedings in the district court system to collect the cost.
- (c) Written permission--right to inspect. A person must have written permission from the department via the specified permit or agreement before the person may construct or alter an entrance.
 - (i) The department reserves the right to inspect and approve any work performed within the right-of-way.
 - (ii) If the work is not performed as required by the permit or agreement, the department may revoke its permission and deny access until the conditions are corrected.
 - (iii) If the work performed does not conform to the department's specifications, the department may make the necessary changes, charge the costs to the party responsible and pursue other available remedies.

761--112.4(306A) GENERAL REQUIREMENTS FOR ENTRANCES WHERE ACCESS RIGHTS HAVE NOT BEEN ACQUIRED.

This rule establishes the general requirements for access to primary highways where access rights have not been acquired.

112.4(1) **Entrance permit**. Prior to the modification of an existing, or the construction of a new, entrance to a primary highway from abutting property or from a local public road or street, an application for a permit to construct an entrance, Form 640004, shall be submitted to and approved by the department.

- (a) The application shall be submitted to the appropriate resident maintenance engineer. However, if the primary highway is under construction, the application may be submitted to the appropriate resident construction engineer.

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- (b) The department shall be provided with a plan, drawing or sketch of the property or site to be served by the requested access. This may vary from a simple sketch in the case of a Type "C" entrance to a detailed plan in the case of a Type "A" entrance. See rule 112.5(306A) for further Type "A" entrance requirements.
- (c) The application shall be signed by the owner or owners of record. The signature(s) shall be notarized.
- (d) If the request is for a property within the corporate limits of a city, an authorized representative of the city must sign the application recommending approval. See subrule 112.4(5).
- (e) The application shall be approved or denied by the appropriate transportation center maintenance engineer. If it is denied, the applicant may request further review by resubmitting the application along with background information and an explanation of the need for access to the director of transportation.

112.4(2) **Construction or modification of entrances.**

- (a) All work performed on a primary highway under the terms of an entrance permit, Form 640004, shall comply with the conditions of the permit. These conditions include any accompanying plans, drawings, sketches, or other attachments to the permit. The permit holder or the permit holder's contractor shall have a copy of the permit available at the work site.
- (b) During the time an entrance is being constructed or modified, care must be taken to ensure the safety of the workers on the site and of the traveling public. The work shall be accomplished in a manner that will minimize interference with normal highway operations. Care must be taken during construction or modification of the entrance and development of the abutting property to avoid tracking mud or other material onto the primary highway.

112.4(3) **Construction costs.** Construction costs, including any costs incurred for modifying the existing primary highway as may be required by the entrance permit, shall not be borne by the department.

112.4(4) **Maintenance of entrances.**

- (a) Property owners having access to a primary highway shall be responsible for the maintenance of their entrances, from the outer shoulder line of the primary highway to the right-of-way line.
- (b) Drainage structures located within the primary highway right-of-way shall be maintained by the department except for concrete box culverts and bridges constructed by a permit holder under authority of an entrance permit. These structures shall be maintained by the permit holder.

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112.4(5) Primary road extensions.

- (a) On primary road extensions, the location and geometrics of entrances must meet local requirements within the limitations of this chapter, and entrance permit applications must be approved by authorized city officials before final action is taken by the department.
- (b) Applicants are responsible for ensuring compliance with local building codes, setback requirements, minimum lot sizes, density of buildings, provisions for adequate parking, and other local ordinances and regulations.
- (c) Entrance permits issued by the department apply to the construction of entrances within the primary highway right-of-way and do not release applicants from compliance with local ordinances and regulations. These requirements are not altered by the issuance of entrance permits. Applicants are responsible for obtaining the required local approvals and permits.
- (d) There shall be no encroachment onto the primary highway right-of-way. Signs shall not be placed on or overhang the right-of-way.

112.4(6) Entrance widths.

- (a) Type “A” entrances. Each case requires special study. See rule 112.5(306A).
- (b) Type “B” entrances.
 - (i) The minimum allowable width is 22.96 feet.
 - (ii) The maximum allowable width is 45.92 feet.
 - (iii) For one-way operation, the minimum allowable width is 13.12 feet and the maximum allowable width is 32.8 feet.
- (c) Type “C” entrances.
 - (i) The minimum allowable width is 16.4 feet.
 - (ii) The maximum allowable width is 32.8 feet.
 - (iii) If an entrance will serve more than one property, the minimum allowable width is 19.68 feet and the maximum allowable width is 36.08 feet.

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(d) City street and secondary road intersections. These shall comply with standards established by the department.

112.4(7) **Radius or flared returns**. Return radii or flared returns shall be determined by the predominant type of vehicle using the entrance.

Return radii for granular entrances shall be measured along the edge of the primary highway shoulder. Return radii for paved entrances shall be measured along the edge of the primary highway pavement.

(a) Type “A” entrances. Each case requires special study. See rule 112.5(306A).

(b) Type “B” entrances, rural-designed area, not paved.

- (i) For an entrance angle of 90 degrees to the centerline of the primary highway, the return radii shall not exceed 39.36 feet.
- (ii) For an entrance angle of 60 degrees to the centerline of the primary highway, the return radius of the obtuse angle shall not exceed 52.48 feet. The return radius of the acute angle shall not exceed 26.24 feet.
- (iii) For an entrance angle that is between 90 and 60 degrees, the maximum radii of the obtuse and acute angles shall be interpolated between the values given in subparagraphs (1) and (2) above and rounded to the nearest 6.56 feet.
- (iv) Entrance angles that are less than 60 degrees shall require department review to establish appropriate radii.

(c) Type “B” entrances, rural-designed area, paved.

- (i) For an entrance angle of 90 degrees to centerline of the primary highway, the return radii shall not exceed 52.48 feet.
- (ii) For an entrance angle of 60 degrees to the centerline of the primary highway, the return radius of the obtuse angle shall not exceed 59.04 feet. The return radius of the acute angle shall not exceed 26.24 feet.
- (iii) For an entrance angle that is between 90 and 60 degrees, the maximum radii of the obtuse and acute angles shall be interpolated between the values given in subparagraphs (1) and (2) above and rounded to the nearest 6.56 feet.

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- (iv) Entrance angles that are less than 60 degrees shall require department review to establish appropriate radii.
- (d) Type “B” entrances, urban-designed area, not paved.
 - (i) All Type “B” entrances within an urban-designed area shall be paved for a minimum distance of 9.84 feet back from the primary highway curb, as measured at 90 degrees to the centerline of the highway.
 - (ii) Return radii shall be in accordance with paragraph e below.
- (e) Type “B” entrances, urban-designed area, paved.
 - (i) The return radius shall equal the distance between the back of the curb and the front edge of the sidewalk, not to exceed 9.84 feet.
 - (ii) Where no sidewalk is present or anticipated, the maximum radius shall be 9.84 feet.
- (f) Type “C” entrances, rural-designed area, not paved.
 - (i) For an entrance angle of 60 to 90 degrees to the centerline of the primary highway, the return radii shall not exceed 13.12 feet for either the obtuse or acute angle.
 - (ii) Entrance angles that are less than 60 degrees shall require department review to establish appropriate radii.
- (g) Type “C” entrances, rural-designed area, paved.
 - (i) For an entrance angle of 60 to 90 degrees to the centerline of the primary highway, the return radii shall not exceed 19.68 feet.
 - (ii) Entrance angles that are less than 60 degrees shall require department review to establish appropriate radii.
 - (iii) If an existing entrance is being reconstructed, the returns may be replaced in kind.
- (h) Type “C” entrances, urban-designed area, paved or not paved. Entrances should be constructed with the same criteria as established for Type “B” entrances within an urban-designed area.

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- (i) Flared entrances, urban-designed area. In an urban-designed area, entrances may be constructed with flares rather than return radii. When used, the flare shall be constructed at a 2:1 ratio with the “2” value measured on a line parallel to the entrance centerline and the “1” value measured on a line perpendicular to the entrance centerline.

112.4(8) Entrance angle.

- (a) In general, the entrance angle shall be established as near to 90 degrees to the centerline of the primary highway as site conditions will allow.
- (b) Normally, the centerline of that part of an entrance lying within the right-of-way shall be at a right angle to the centerline of the primary highway for a minimum distance of 32.8 feet from the near edge of the highway pavement.
- (c) An entrance established for two-way operation for a service station or other development where two access points are authorized shall be 70 to 90 degrees to the centerline of the primary highway.
- (d) On a divided primary highway where two access locations are authorized for one-way operation, the “ingress” may be 45 to 60 degrees to the centerline of the primary highway and the “egress” may be 60 to 90 degrees to centerline of the highway.

112.4(9) Slope and cross section of entrances in rural-designed area.

- (a) The finished, surface elevation of an entrance over a culvert, or the location where a culvert would normally be placed, should be sloped away from the primary highway pavement, preferably an extension of the 4 percent shoulder slope, to prevent surface water from draining onto the highway pavement.
- (b) If an entrance requires drainage pipe, the entrance side slopes from highway shoulder to the entrance pipe shall be no steeper than 8:1 and from the entrance pipe to the right-of-way line shall be no steeper than 6:1. A smooth transition from the 8:1 to the 6:1 slope requirements shall be accomplished.
- (c) If an entrance does not require drainage pipe, the entrance side slopes from highway shoulder to the minimum clear zone distance shall be no steeper than 10:1, right-of-way width permitting. From the point of minimum clear zone to the right-of-way line, a smooth transition to a 6:1 slope is acceptable. The minimum clear zone distance shall be determined using the AASHTO Roadside Design Guide.
- (d) Upgrading only the surfacing material of an existing entrance will not require a change in existing side slopes.

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761--112.5(306A) ADDITIONAL ENTRANCE REQUIREMENTS FOR COMMERCIAL, INDUSTRIAL OR RESIDENTIAL DEVELOPMENTS.

This rule establishes additional requirements for Type “A” entrances serving commercial, industrial or residential developments.

112.5(1) General.

- (a) The most important factors in developing an access plan for a commercial, industrial or residential development are a determination of the potential traffic generated by the site and the directional distribution of site-generated traffic on the major approach routes and proposed entrances serving the site. Entrances serving the site represent an important element in the efficiency and safety of the highway handling the site-generated traffic. To properly handle traffic from these entrances, the anticipated traffic volumes must be determined by the applicant and submitted to the department.
- (b) The location of entrances, particularly commercial entrances, is a critical factor in minimizing disruption to traffic and pedestrians. A site should be developed with an internal circulation pattern for traffic movements so that access to the site may be gained by a free flow of traffic from the primary road system. Parking stalls and pedestrian movements should be located away from the main entrance to the facility.
- (c) Adequate storage for vehicles must be provided on commercial and industrial sites so that vehicles do not wait on the highway to enter. Adequate storage space is a function of the demand volume, service time per facility, and the number of service facilities available. Service time is dependent upon the time required to maneuver into position and the time needed to obtain the service. The geometrics of the internal circulation pattern control a portion of the service time. The radii of internal curves should be as large as possible. Buildings on a site should be arranged to allow for the maximum storage available on the site for exiting traffic and situated so they will not disrupt the free flow of entering traffic.
- (d) A service station site should be designed to provide a minimum distance of 16.4 feet from the right-of-way line to the near edge of the pump island. No portion of the highway right-of-way shall be used for servicing vehicles.
- (e) When property is being developed, consideration must be given to locating the access directly opposite an existing commercial entrance or street intersection.
- (f) Comments from local authorities regarding the proposed development should be included in the application to allow the department to incorporate the input of local authorities into the final design of the entrance location. This input should refer to the zoning plan, land use plan, or metro-transportation plan.

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112.5(2) Shopping center and industrial access requests.

- (a) An entrance permit application for a shopping center or industrial development shall, when relevant to the development, include the following data in detail:
 - (i) Type and location of the proposed development.
 - (ii) Site plan.
 - (iii) Location of all proposed entrances, turning lanes on adjacent highways or streets, and internal traffic lanes and parking facilities within the development area. This information shall be sufficiently complete to allow determination of dimensions, the direction of traffic flow, and restrictions to traffic caused by plantings, curbing, medians, walls, signing, etc.
 - (iv) Detailed design of proposed highway pavement widenings, additional lane provisions, relocations, and other highway improvements considered necessary to the efficient operation of the proposed development.
 - (v) Proposed traffic signal locations.
 - (vi) Preliminary drainage data.
 - (vii) Gross leasable floor area in square feet.
 - (viii) Number of parking spaces.
 - (ix) Anticipated total daily trips inbound and outbound during an average 24-hour period for total site development. Special holiday shopping traffic shall not be used for this estimate.
 - (x) Estimated traffic volumes arriving and departing during the normal peak hour.
 - (xi) Estimated distribution of traffic via individual entrances for the normal peak hour.
 - (xii) Estimated distribution of traffic by percentage of total daily trips via major highways from origin to the development.
- (b) Reserved.

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112.5(3) Agreement supplementary to permit.

- (a) A major commercial development often involves a variety of special access requirements. In addition to the entrance permit, an agreement may be required to fit the particular situation, listing in detail the responsibilities of the applicant, the local governmental unit and the department. When applicable, the department shall draft an agreement and forward it to the applicant. The department shall not be responsible for any costs incurred as a result of the proposed development.
- (b) Upon receipt of the agreement, the applicant shall be responsible for obtaining the necessary signature approvals including those of appropriate local authorities and returning the agreement to the resident maintenance engineer.
- (c) The department shall notify the applicant when it has approved the agreement. No work shall be done within the primary highway right-of-way prior to this time. Any work completed without the prior approval of the department is a violation of Iowa Code section 319.14.

761--112.6(306A) DRAINAGE REQUIREMENTS.

This rule establishes drainage requirements for all locations where access is requested to the primary highway system.

- 112.6(1) Entrances must be constructed so that they do not adversely affect primary highway drainage or drainage of the adjacent property. The drainage and the stability of the highway subgrade must not be impaired by driveway construction or roadside development. In no case may the construction of an entrance cause water to flow across the primary highway pavement or pond on the shoulders or in the ditch, or result in erosion within the primary highway right-of-way limits.
- 112.6(2) Drainage collected by ditches, gutters or pipes on private property shall not be discharged into the primary highway drainage system unless expressly approved by the department. An applicant may be required to submit a drainage study to the department justifying the drainage system proposed and the pipe or sewer sizes to be used. The applicant shall not interfere with the natural course of drainage.
- 112.6(3) When the construction of an entrance necessitates crossing a highway ditch that has been constructed to carry drainage, a drainage structure shall be installed in the ditch by the applicant at the applicant's expense. The low point of the ditch shall dictate the location for culvert placement unless otherwise specified by the department. Under no circumstances shall existing ditches or gutters be filled without adequate alternate provisions for drainage.
 - (a) The resident maintenance engineer will assist in determining the size and length of culverts and aprons. A culvert shall be of adequate size to handle drainage, but in no case shall the culvert be less than 1.476 feet in diameter. Culvert pipe shall comply with departmental standard specifications as they exist at the time of installation.

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- (b) Length of culvert pipe shall be sufficient to accommodate the entrance slopes. The finished, surface elevation of an entrance over a culvert pipe, or the location where a culvert would normally be placed, should be sloped away from the primary highway pavement, preferably an extension of the 4 percent shoulder slope, to prevent surface water from draining onto the highway pavement.
- (c) Drainage structures located within the primary highway right-of-way shall be maintained by the department except for concrete box culverts and bridges constructed by a permit holder under authority of an entrance permit. These structures shall be maintained by the permit holder.

112.6(4) Where drainage is carried along an existing curb, the entrance shall be constructed with a rise in elevation of 0.492 to 0.738 feet from the street gutter at the entrance to a point 6.56 feet behind the gutter to prevent runoff from spilling onto private property. The flow line of the gutter through the entrance shall be restored. Where a curb is cut for the construction of an entrance, the entire curb and gutter section must be removed. Removal of only the raised portion of the curb and then paving over the broken section shall not be allowed.

761--112.7 Reserved.

761--112.8(306A) ACCESS TO PRIORITY V HIGHWAYS, RURAL AREAS.

This rule establishes requirements for access to Priority V highways in rural areas.

112.8(1) **General.** Where access rights have not been acquired, access is limited to one entrance for contiguous highway frontage not exceeding 984 feet, two entrances for contiguous highway frontage exceeding 984 feet but not exceeding 1,968 feet, and so on. Ownership on each side of the highway shall be considered as separate ownership. Except for the above-stated restrictions and those contained in subrules 112.8(2) and 112.8(3), no spacing distance restrictions shall be imposed. Additional entrances may be permitted when a single entrance will not provide adequate access due to topographic conditions.

112.8(2) Access requirements near public road intersections.

- (a) A property abutting a primary road and a local public road or another primary road may be granted access to the primary road at a distance preferably no less than 328 feet from the intersection of the centerlines of the two roads.
- (b) At a “T” type intersection, access to the primary road may be located directly opposite the intersection.

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- (c) Access shall not be permitted onto a local public road within the primary road right-of-way limits. The centerline of an access onto a local public road shall be no closer than 164 feet to the near edge of the primary highway traveled way.

112.8(3) **Property lines.** The centerline of an entrance to the primary roadway shall be no closer than 52.48 feet to the property line as extended to intersect the roadway centerline at right angles. No portion of an entrance shall extend beyond the property line as extended unless the adjacent property owner has joined in the permit. An entrance to serve two properties abutting the primary road may be centered on the property line by mutual agreement between the property owners.

761--112.9(306A) ACCESS TO PRIORITY V HIGHWAYS, FRINGE OR BUILT-UP AREAS, AND PRIORITY VI HIGHWAYS, ALL AREAS.

This rule establishes requirements for access to Priority V highways in fringe or built-up areas, and access to Priority VI highways in rural, fringe, or built-up areas.

112.9(1) **General.** Property frontage may be granted access where needed to the primary road, provided safety and construction standards are satisfactory. In a rural area, a minimum distance of 32.8 feet between toes of slopes along the centerline of the ditch shall be maintained. In a fringe or built-up area, there shall be a minimum of 16.4 feet of curb maintained between near edges of curb drops when more than one access is allowed to a single highway frontage.

112.9(2) Access requirements near public road intersections.

- (a) Rural area. Same as subrule 112.8(2).
- (b) Fringe or built-up area.
 - (i) The beginning of the curb drop for an entrance to a primary highway shall be no closer than 16.4 feet to an intersecting street's curb tangent point. No portion of the entrance along the primary highway shall extend beyond the property line extended or into a crosswalk.
 - (ii) The curb drop for an entrance to a street should be no closer than 16.4 feet to an intersecting primary highway's curb tangent point. No portion of the entrance along the intersecting street shall extend beyond the property line extended or into a crosswalk.
 - (iv) If an intersection does not have an existing or a planned curb and gutter to define the radius, the following assumptions shall be applied to the above requirements for determining the location of an entrance:

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- Minimum width of the traveled way of the primary highway is assumed to be 52.48 feet back to back of curbs.
- However, if the platted width of the primary highway right-of-way is less than 65.6 feet, the width of the traveled way is assumed to be 75 percent of the platted width.
- Minimum width of the traveled way of an intersecting local public road or street is assumed to be 30.832 feet back to back of curbs.

112.9(3) **Channelized intersection or divided highway.** When there is a median in a primary road or intersecting street, or both, the curb drop for an entrance to the primary road or intersecting street shall be determined as stated in subrule 112.9(2), except that at the beginning or end of the median, or at a median break, the nearest edge of the curb drop for the entrance shall be no closer than 19.68 feet to the end of the median as measured at right angles to the median. This does not apply to access centered on a median break.

112.9(4) **Median crossovers.**

- (a) When a divided primary highway has been constructed with a median, crossovers or median breaks shall not be permitted if there are frequent openings for local street intersections or traffic conditions do not make median breaks advisable. The layout of entrances to adjacent properties along the primary highway shall be designed to take advantage of existing or planned median crossovers.
- (b) When a crossover or median break is deemed necessary by the department as a result of traffic generated by a business or other development, the required improvements shall be constructed by the property owner as a part of a permit process. The department shall bear no part of the construction costs.
- (c) The permit authorizing a new crossover shall specify the exact location, design, and construction requirements. Any drainage facilities required by the construction shall be installed by the permit holder at the permit holder's expense.
- (d) The minimum width of a new median crossover is 39.36 feet. In a rural-designed area, the width of a median crossover shall be measured at the normal culvert line. In an urban-designed area, the width of a median crossover shall be measured parallel to the highway centerline between the curbed noses of the median.
- (e) Upon completion of construction of the improvements as provided by this subrule, the department shall assume ownership of the improvements and shall be responsible for their future maintenance.

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112.9(5) **Property lines.**

- (a) Rural area. Same as subrule 112.8(3).
- (b) Fringe or built-up area. The beginning of an entrance radius return or taper shall be no closer than 0.984 feet to the property line as extended on an interior lot line to intersect the primary road centerline at right angles. An entrance to serve two properties abutting the primary road may be centered on the property line by mutual agreement between the property owners.

112.9(6) Reserved.

761--112.10 Reserved.

761--112.11(306A) **POLICY ON ACQUISITION OF ACCESS RIGHTS.**

112.11(1) **General.** It is necessary that every effort be made to preserve the public investment in the primary highway system. Where efficiency of traffic movement is desired, this investment is preserved by acquiring the adjacent property's access rights and limiting or prohibiting direct access to the primary highway. This provides a safer environment for the highway user, increases the free and efficient movement of through traffic, and reduces highway accidents by minimizing the number of conflict points or entrances located along the highway.

112.11(2) **Project development.** During the initial stages of project development for a highway improvement project, the department shall determine if access rights to the primary highway will be acquired and the applicable access priority classification to be applied.

The department shall consider average daily traffic, proposed design features of the facility, terrain, the function of the particular section in relation to the total highway system, the commercial/industrial network of highways, service level, continuity of the system and sound engineering judgement.

112.11(3) **Access rights at at-grade intersections with city streets and secondary roads.**

When access rights to a primary highway are acquired, the department may also acquire access rights along a city street or secondary road where an at-grade intersection with the highway exists or is proposed. Access rights may be acquired along the city street or secondary road for a distance of 164 feet from the near edge of the primary highway traveled way.

112.11(4) **Access rights at at-grade primary intersections.**

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- (a) When access rights to a primary highway in a rural area are acquired, access rights may also be acquired along an intersecting at-grade primary highway for a minimum distance from the intersection of the centerlines of the two primary highways as follows:
 - (i) 164 feet when the intersecting primary highway carries less than 2,500 vehicles per day.
 - (ii) 328 feet when the intersecting primary highway carries 2,500 or more vehicles per day.
- (b) If the intersection is channelized, access rights shall be acquired and no access shall be permitted along the channelized primary highway for a minimum distance of 984 feet beyond the end of the median.

112.11(5) **Access rights along primary roads at interchanges.** Access rights shall be acquired along primary roads at interchange locations as follows:

- (a) For a two-lane undivided primary road through an interchange area, access rights shall be acquired and no access shall be permitted for a minimum distance of 656 feet beyond the point of ramp bifurcation in a rural or fringe area and 328 feet in a built-up area.
- (b) For a two-lane primary road having four or more divided lanes through an interchange area, access rights shall be acquired and no access shall be permitted for a minimum distance of 656 feet beyond the point of ramp bifurcation.
- (c) In a rural area, local public roads shall be relocated to a connecting point a minimum of 656 feet beyond the point of ramp bifurcation.
- (d) In a built-up area, local public roads shall be relocated to a connecting point a minimum of 328 feet beyond the point of ramp bifurcation.
- (e) When an interchange is constructed as a half-diamond or partial cloverleaf, access may be allowed directly opposite each ramp connection to the primary road.

112.11(6) **Access rights along secondary roads at interchanges.** Access rights shall be acquired at all interchange locations with secondary roads and no access shall be permitted along the secondary road for a minimum distance of 328 feet beyond the point of ramp bifurcation.

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112.11(7) **Access rights along city streets at interchanges.** Access rights shall be acquired at all interchange locations with city streets and no access shall be permitted along the city street for a minimum distance of 164 feet beyond the point of ramp bifurcation.

112.11(8) **Agreement with city or county.** When access rights are acquired along a city street or secondary road, an agreement shall be negotiated with the city or county stating that access rights shall be acquired by the department in the state's name or in the name of the city or county and the city or county shall not permit any third party to use the controlled portion of the street or road without the prior written consent of the maintenance division.

761--112.12(306A) **POLICY ON LOCATION OF PREDETERMINED ACCESS LOCATIONS.**

112.12(1) **General.** At the time access rights are acquired, existing entrances shall be removed or relocated to connect to predetermined access locations. These locations shall thereafter be defined as the adjacent properties' access locations.

- (a) The department shall be responsible for the construction of entrances at predetermined access locations, either as a part of the project or at a future date when requested by the property owners.
- (b) Any alteration or relocation of an access location shall require the written approval of the department, and the property owner shall be responsible for all costs incurred.

112.12(2) **Establishing predetermined access locations.**

- (a) The department, when reviewing the final design plans for a proposed project, shall designate access locations by:
 - (i) Reviewing the zoning and intended land use with city and county officials.
 - (ii) Conducting a field examination, giving consideration to information from city and county officials as well as sight distance availability, natural barriers, property lines and the development of future frontage roads.
- (b) Access locations not constructed as part of the project shall be designated on the construction plans.

112.12(3) **Spacing.** Spacing between predetermined access locations shall conform to the following requirements:

- (a) Priority I highway. Access is allowed only at interchange locations.
- (b) Priority II highway. 5,248 feet is desirable. 2,624 feet is the minimum.

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(c) Priority III highway.

- (i) Rural-designed area. 1,312 feet is desirable. 984 feet is the minimum.
- (ii) Urban-designed area. 656 feet is the minimum.

(d) Priority IV highway.

- (i) Rural-designed area. 656 feet is the minimum.
- (ii) Urban-designed area. 328 feet is the minimum.

112.12(4) **Entrances constructed after project completion.** An entrance constructed at a predetermined access location after completion of the highway project and at the department's expense shall, unless otherwise specified in the right-of-way contract or by the courts, be a granular surfaced entrance with a width not exceeding the maximum for a Type "B" entrance. The department may approve modifications, such as widening or paving the entrance. The cost of modifications are the responsibility of the property owner.

112.12(5) **Revision of access.** After an entrance has been constructed at a predetermined access location, no change in entrance type or location may be made unless a revision of access has been approved by the department. The property owner is responsible for the cost of altering or relocating the entrance.

- (a) A request for revision of access shall be submitted by the property owner to the resident maintenance engineer upon the appropriate application form furnished by the department.
- (b) The application shall be approved or denied by the maintenance division. If it is denied, the applicant may request further review by resubmitting the application along with background information and an explanation of the need for access to the director of transportation.

761--112.13(306A) **POLICY ON SPECIAL ACCESS CONNECTIONS WHERE ACCESS RIGHTS HAVE BEEN PREVIOUSLY ACQUIRED.**

112.13(1) **General.** An additional entrance to a property from which access rights have been previously acquired may be permitted only as a special access connection.

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- (a) An applicant for a special access connection should be aware the state of Iowa has previously acquired the rights of direct access to the primary highway from the applicant's highway frontage and, therefore, the applicant has no remaining right of additional direct access to the highway.

This acquisition of access rights is recorded in the local county courthouse and is a restriction placed upon the property.

- (b) The department realizes there may be locations where granting an entrance within an area where access rights were previously acquired may be consistent with the department's current rules.

In these special cases, the department may authorize a special access connection upon such terms and conditions as may be determined by the department.

- (c) In an area where access rights were acquired after July 1, 1966, an applicant may be required to reimburse the state for the increase in land value resulting from the new connection, as determined by a department appraisal.

112.13(2) **Application.**

- (a) A request for the establishment of a special access connection shall be submitted by the property owner to the resident maintenance engineer upon the appropriate application form furnished by the department.
- (b) The application shall be approved or denied by the maintenance division. If it is denied, the applicant may request further review by resubmitting the application along with background information and an explanation of the need for access to the director of transportation.

112.13(3) **Requirements.**

- (a) Whenever possible, a special access connection should be established as a joint access location to serve more than one property ownership.
- (b) A special access connection is a special permit for access and is not a permanent right of access to the highway.
- (c) The property owner shall be responsible for all costs incurred for the construction of the approved connection, including any required drainage structure.
- (d) A special access connection shall be recorded by the department in the county recorder's office and will be a restriction placed upon the property. All provisions of the special access connection shall be binding on successors or assigns of the applicant property owner.

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- (e) Special access connections shall be constructed in compliance with rules 112.4(306A), 112.5(306A) and 112.6(306A).
- (f) Spacing for special access connections shall conform to subrule 112.12(3) and shall be maintained on both sides of the highway.

761--112.14(306A) **RECREATIONAL TRAIL CONNECTIONS.**

This rule establishes requirements for access to the primary road system from recreational trails.

112.14(1) **General.**

- (a) No access to a Priority I highway from a recreational trail is allowed.
- (b) Reserved.

112.14(2) **Application.**

- (a) An application for access to a Priority II, III, or IV highway shall be submitted and processed in accordance with subrule 112.13(2).
- (b) An application for access to a Priority V or VI highway shall be submitted and processed in accordance with subrule 112.4(1).
- (c) The applicant shall submit with the application a detailed plan sufficient for departmental review. The plan shall include an appropriate recreational trail signing layout.
- (d) The applicant may contact the resident maintenance engineer for assistance in preparing the application.

112.14(3) **Requirements.**

- (a) Spacing.
 - (i) Spacing for a Priority II, III or IV highway shall conform to subrule 112.12(3). It is preferable that an entrance provide access to adjacent properties as well as to the recreational trail.
 - (ii) Spacing for a Priority V or VI highway shall conform to rule 112.8(306A) or 112.9(306A) as applicable.

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- (b) Sight distance. Sight distance for a recreational trail connection shall conform to the desirable sight distance as listed in subrule 112.2(28).
- (c) Entrance width and radius return. The entrance width and radius return of a recreational trail connection shall conform to the design standards adopted for the Statewide Iowa Trails Plan.
- (d) Entrance angle. The entrance angle for a recreational trail connection shall be established as near to 90 degrees to the centerline of the primary highway as site conditions will allow.
- (e) Slope and cross section. The slope and cross section of a recreational trail connection shall conform to subrule 112.4(9).
- (f) Drainage. Drainage for a recreational trail connection shall conform to rule 112.6(306A).
- (g) Construction. The permit holder shall be responsible for constructing the recreational trail connection in compliance with the approved permit and at no cost to the department. The department reserves the right to inspect any work performed within the primary highway right-of-way. See subrule 112.3(3).
- (h) Maintenance. Maintenance responsibilities shall conform to subrule 112.4(4).

These rules are intended to implement Iowa Code sections 306.19, 306A.1 to 306A.8, and 319.14.

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