A/GFTC
Access Management

Presented by

Resource Systems Group

With

Saratoga Associates

GUIDE TO ACCESS MANAGEMENT IN THE A/GFTC AREA

The Adirondack / Glens Falls Transportation Council (A/GFTC) is the Metropolitan Planning Organization (MPO) designated by the Governor of the State of New York for Warren and Washington Counties and the Town of Moreau in Saratoga County. It has the responsibility of developing and maintaining both a Regional Transportation Plan and a Transportation Improvement Program for the area's federal aid eligible highway and public transit facilities. The A/GFTC also sponsors and conducts studies and assists its member municipalities and counties with planning activities such as this Access Management Guidebook.

The purpose of this Guidebook is to provide an access management resource tailored to the needs of A/GFTC's planning and programming area. The importance and many benefits of access management have been well-documented during the past decade. This introduction will provide an overview of the field with following chapters providing more in-depth resources and reference tools.

The guidebook includes eight chapters addressing the following topics:

- Chapter 1 provides a general introduction to access management and its implementation techniques.
- Chapter 2 summarizes the tools and principles introduced in Chapter 1 using national materials.
- Chapter 3 provides case studies of the A/GFTC Area.
- Chapter 4 provides sample regulations from across the state.
- Chapter 5 includes information on permitting new access points.
- Chapter 6 includes a sample slide show for illustrating and educating the public on access management.
- Chapter 7 addresses the impacts of access management techniques on other user groups including bicycle, pedestrian and transit users.
- Chapter 8 provides reference information.

WHAT IS ACCESS MANAGEMENT?

Access Management seeks to limit and consolidate access along major roadways, while promoting a supporting street system and unified access and circulation systems for development. The result is a roadway that functions safely and efficiently for its useful life, and a more attractive corridor.[1]

Public roadways are designed for two primary purposes – providing access to lands and transporting persons and goods. Without careful management, these purposes can each override the functioning

[1] http://www.accessmanagement.gov/ Access Management Transportation Research Board Committee ADA70 Home Page

of the other. A residential or educational land use is not best served by a high-speed, high-traffic roadway. Likewise, a roadway designed to move traffic through an area will work less effectively with stop-lights and intersections at too frequent intervals. Access management serves to balance these two purposes with the ultimate goal of optimizing mobility, safety and access. It is a process and a planning method that relies on a wide set of tools.

In general, access management aims to develop a continuum of road purposes. On one end are roadways designed to move large amounts of traffic efficiently over longer distances. At the other end are roadways designed to access individual parcels. By applying different geometric and development standards to these roadway types, the road system can best continue to serve its two primary purposes.

WHY ACCESS MANAGEMENT?

As part of the public infrastructure, the roadway network must be designed to most efficiently serve the public good. Doing so requires providing sufficient but not excessive infrastructure. It also requires protecting the infrastructure that is installed to ensure it is used most efficiently – reducing cut-through traffic on small, local roads while maintaining mobility on important arterial connections. Implementing access management techniques has been shown to increase safety and reduce travel time. The National Cooperative Highway Research Program (NCHRP) Report 420: Impacts of Access Management Techniques, sponsored by the Transportation Research Board, reviewed various access management techniques and examined their benefits. The report found significant limitations to the roadway with uncontrolled access points including:

- For every additional traffic signal per mile, travel speed is reduced by 2-3 miles per hour (mph).[2]
- Each additional access point per mile increases the accident rate by about 4 percent.[3]
- Each additional access point per mile reduces travel speeds by 0.25 mph up to a 10 mph decline.[4]

In addition to the quantifiable, objective benefits, access management also can improve the aesthetics and marketability of a region. By working with permitting authorities, businesses can identify optimal solutions to meet the needs of the community and industry. Some of the qualitative benefits include:

- Access management makes it easier and safer for customers, employees and trucks to reach businesses.
- Decreased congestion and reduced travel times increase the potential market area.

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[2] Pg 2, NCHRP Report 420.

[3] Pg 3, NCHRP Report 420.

[4] Pg 5, NCHRP Report 420.

- Properly designed entrances shared by multiple businesses allow more site area for parking, more customer options to access a business, and improved landscaping or other site amenities.

Figure 1 illustrates the overall difference in an access-controlled commercial area compared to a commercial area without access guidelines.

Figure 1: Comparison Images of Access-Controlled and Open-Access Commercial Areas on Arterial Roadways

Open-Access Commercial Area on an Arterial	Access-Controlled Commercial Area on an Arterial
	

EXAMPLES OF ACCESS MANAGEMENT STRATEGIES

Implementing good access management techniques relies on (1) effective local, county, and state planning, access permitting, and development regulations that encourage the appropriate development or redevelopment of individual parcels, and (2) appropriate roadway, intersection, and driveway design.

Planning and Land Development-Based Techniques

Planning level access management techniques are implemented by municipalities, counties, and the New York State Department of Transportation (NYSDOT). These authorities regulate development and manage the road network through policies, plans, and land use codes. Long range transportation plans for A/GFTC and the state and local comprehensive plans can lay a foundation by including goals, objectives, and policies related to access management. These plans may also classify the roadway network according to function and desired level of access control.

The general policies outlined in transportation and comprehensive plans are implemented through design guidelines, such as NYSDOT's "Policy and Standards for the Design of Entrances to State Highways", and through local zoning codes and subdivision regulations. For example, access management overlay districts can be included in zoning regulations and may limit access based on roadway functional class, specific corridors, or activity areas.

Subdivision and site plan regulations can be used to regulate land division in accordance with desired access plans. They can require certain roadway network systems within the subdivision or limit the

number of access points on an arterial to which any given project is entitled. Regulations can require interconnections between parcels (Figure 2), limit the amount of traffic permitted to access the road network, or require new frontage roads (Figure 3, next page). Chapter 4 includes sample regulations from locations within New York State.

Figure 2: Parcel Interconnection – *The image below illustrates poor access management. Instead of allowing vehicles to travel between contiguous parcels without using the road network, a physical barrier has been installed.*

Figure 3: Frontage Road Installation - *The image on the left illustrates use of a frontage road. Frontage roads allow for a single intersection on the primary road while providing direct access to individual parcels. In the absence of a frontage road a primary road can suffer from frequent and wide curb cuts as illustrated in the image on the right.*

Design Techniques

Planning level techniques provide the foundation and framework for implementing effective access management designs. Design techniques provide specific guidance on how driveways, intersections, and roadways should be built. Proper design reduces confusion and conflicts between through and turning vehicles on an arterial; reduces conflicts between vehicles and other roadway users such as pedestrians, cyclists, and transit riders; and allows vehicles to move from one class of highway to another through safe and efficient intersections.

Design features that can affect access include: driveway width; driveway configurations that restrict certain movements; spacing of driveways and intersections; turning radii to accommodate passenger

cars, trucks, and transit vehicles; turn lanes on the arterial approach to intersections and driveways; and type of roadway median. Chapter 2 provides examples of all of these techniques. A few examples are discussed below.

The driveway shown in Figure 4 has been channeled to prevent left-turning traffic, the most dangerous and most capacity consumptive movement at intersections, into or out of the property. Eliminating left turns streamlines the vehicle flow and improves capacity and safety.

***Figure 4: Driveway Channelization** - As Illustrated Below, Prevents Left-Turning Traffic from Accessing the Primary Roadway*

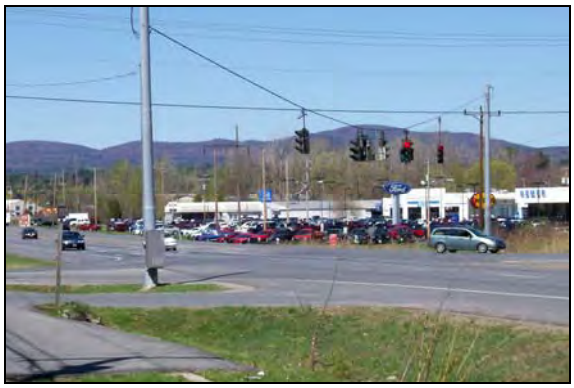
A non-traversable median, like the one illustrated in Figure 5 also eliminates left turns. In addition, a median can improve access in a corridor by redirecting traffic to intersections designed to safely and efficiently accommodate through and turning vehicles. Medians also create an opportunity to improve access for pedestrians by providing a protected refuge space for crosswalks on a multi-lane arterial.

Figure 5: Non-Traversable Median

Providing sufficient distance between driveways and intersections, referred to as corner clearance, is another example of a design technique. Corner clearance allows an intersection to operate without interference from vehicles entering or exiting a nearby curb cut. Adequate corner clearance also improves access to adjacent properties. The driveway will not be blocked by vehicles queued at the intersection and decision making for drivers entering and exiting the driveway is not complicated by

the numerous maneuvers that occur on the approaches to an intersection. Figure 6 illustrates insufficient downstream and upstream corner clearance.

Figure 6: Corner Clearance



Traffic signal spacing is another access management consideration. Spacing signals and large intersections at long, uniform distances makes it easier to coordinate traffic signals which allow for constant speeds and minimal stops along the roadway. Intersections with short cycle lengths and very low volumes can be spaced as little as ¼ mile apart while minimizing stops for vehicles traveling through along an arterial. However, more typical intersections require spacing closer to ½ mile to minimize stops.

Figure 7: Signal and intersection spacing – *As illustrated below, when signals are too close together the queues can spill back and block neighboring intersections.*

THE GUIDEBOOK

The following chapters include information about access management in more detail. The contacts on the next page can answer specific questions about access management in general and specific to A/GFTC.

Access Management Contacts

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SAFE ACCESS IS GOOD FOR BUSINESS

U.S. Department of Transportation
Federal Highway Administration

You may be reading this primer because your state transportation agency or local government has told you about plans that will affect access to your business. They may be planning to install a raised median on your roadway, to close a median opening, or to reconfigure your driveway. Perhaps your request for a driveway is under review or the regulating agency has imposed conditions on its approval. Or, maybe the state or local agency is planning a new access policy and you have questions or concerns about the economic effects of these changes.

Whatever the reason, it is important for you to understand the basis for these changes and how they might affect your business. This primer will address questions you may have about access management and its effect on business activity and the local economy. It focuses on economic concerns that may arise in response to proposed access changes or policies, including potential impacts on business activity, freight and deliveries, parking for customers, and property or resale value of affected property.

Why is my access being changed or reviewed?

The access changes being proposed for your business or road are part of a growing effort by government agencies to improve how major transportation corridors are managed. These efforts, known as access management, involve the careful planning of the location and spacing of driveways, street connections, median openings and traffic signals. Access management can also involve using medians to channel left-turns to safe locations, and providing dedicated turn lanes at intersections and access points to remove turning vehicles from through lanes. The combined purpose of these strategies is to reduce crashes and traffic delay.

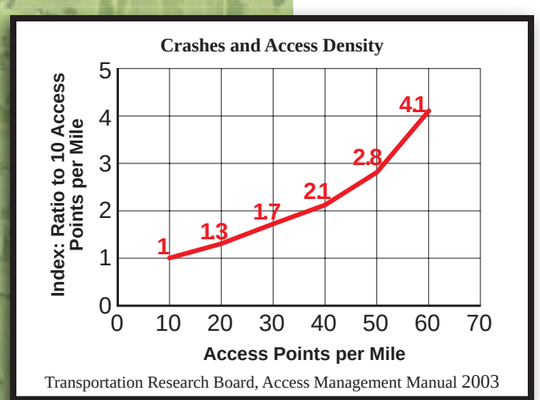
To understand access management, it is important to know that roads have different primary functions; either to provide access or move traffic.

- The main function of ***minor roads***, like neighborhood collectors and local streets, is to provide access. Minor roads must operate at slower speeds so people can enter and exit homes and businesses safely and conveniently.
- The main function of ***major roads***, like interstate freeways and regional highways, is to move traffic over long distances at higher speeds. Access to these roads must be carefully managed so requests for new access to development do not contribute to unsafe or congested conditions.

How exactly does this improve the situation on my road?

One reason managing access on major roads is so important is that driver safety is reduced when access is not properly located and designed. Imagine, for example, a driveway on an interstate freeway – it would certainly cause serious safety concerns. These same safety problems occur with improperly designed access to major arterial roads.

> *"In the four years I have lived here we at times have seen a lot of rear end collisions here, and we haven't seen one now for a long time."*
>
> **— E. Stanley Tripp of Tripp's Auto Sales in Spencer, Iowa, commenting on a median project in his area.**



Transportation Research Board, Access Management Manual 2003

Managing access on your road can result in better traffic flow, fewer crashes, and a better shopping experience for you and your neighboring businesses. Consider the effects of adding more access points to a highway. A national study in the late 1990s looked at nearly 40,000 crashes and data from previous studies to determine the crash rate associated with adding access points to major roads. It found that an increase from 10 to 20 access points per mile on major arterial roads increases the crash rate by about 30% *(1)*. The crash rate continues to rise as more access is permitted. This is why **studies consistently show that well-managed arterials are often 40 to 50 percent safer than poorly managed routes** *(2)*.

How can I have a say in the access management project on my road?

Get involved! All government agencies are required to involve the public in transportation policy and project decisions. Most state transportation agencies offer open house meetings during transportation project planning and design, and both state and local government agencies conduct public meetings and hearings when making important policy or regulatory changes that involve access management. Prospective business owners can also review area master plans to research potential changes.

It is important for you as a stakeholder in an access management project to attend public meetings and hearings and to voice your ideas and concerns.

These meetings are opportunities for you to hear more about an access management project or plan and to make the planners and engineers aware of how it impacts your business. This might involve issues related to internal traffic circulation and parking, deliveries, plans for expansion, etc. Knowing this information early in project planning or design allows them to make better project decisions and can result in changes that reduce or avoid adverse impacts on your business.

For example, many businesses depend on trucks for deliveries and other functions. Larger trucks are not typically able to make certain movements (such as U-turns). It is important to work with agency staff to develop a plan that will accommodate truck access to your business in a manner as convenient as possible. Sometimes this will require that trucks follow a slightly different route to arrive at the property. Project planners can work with you to assure that trucks will be able to access your business. This is just one of many ways your input is important.

Where can I go to learn more about access management?

Hopefully this primer has answered some of the questions that you, as a business or property owner, may have. Your state or local transportation agency or your state's Federal Highway Division office (on larger projects) are other excellent resources to point you to the right project manager, or to answer your general questions concerning access changes. These transportation agencies need and value your input as they strive to provide a safe and efficient highway system.

For the latest information on access management or to order the latest Access Management Library CD/DVD collection, go to **www.accessmanagement.gov**. Other important sources for information on the economic effects of access management include the TRB Access Management Manual, and NCHRP Report 420: Impacts of Access Management Techniques, which are both available from the Transportation Research Board at **www.trb.org**.

What can be done to keep my business going during construction?

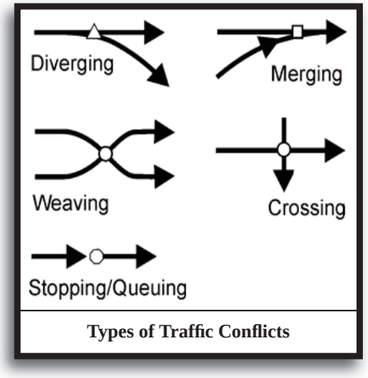
There's no doubt about it, road construction can disrupt customers and drivers, but there are ways adverse impacts can be minimized. **Two key issues during construction are maintaining open access to businesses for customers and deliveries, and having sufficient sign visibility so your customers know you are open, and know how to enter and exit your site during this period.** When your road is scheduled for reconstruction, your transportation agency will initially notify you about what to expect in terms of traffic, duration of construction, any foreseeable disruptions, and so on. It is important for you to respond to them about your special needs and concerns. Below are some of the things that you can ask of the agency:

- Provide clear signs from the roadway to business entrances;
- Provide temporary and/or secondary business access points, where feasible;
- Schedule construction for after business hours or to occur during times of low usage for seasonally-oriented businesses;
- Provide alternative parking, if possible and avoid taking or blocking parking spaces;
- Stagger construction along a corridor so impacts are localized and staged;
- Expedite construction through incentive/disincentive programs;
- Avoid blocking business entrances with construction equipment or construction barriers;
- Establish a single point of contact in the agency about the construction project to communicate with property and business owners and help address issues that may arise;
- Provide regular project progress reports to business and property owners.

Business owners certainly may see drops in gross revenues during construction. But these are not unlike drops you may routinely experience during expansions, remodeling, seasonal variations, or other self-initiated management. Experience has shown that "construction" drops are temporary too, and that retail sales typically return to pre-construction levels or greater. Research findings from corridors in Texas indicate that businesses did not change employment levels during construction periods. This finding indicates that retailers understand that construction projects are a temporary and perhaps even an inevitable disruption to business, and that loyal patrons will return to stable businesses. The same research found that gross revenues typically either returned to pre-construction levels or were higher after construction was complete *(7)*.

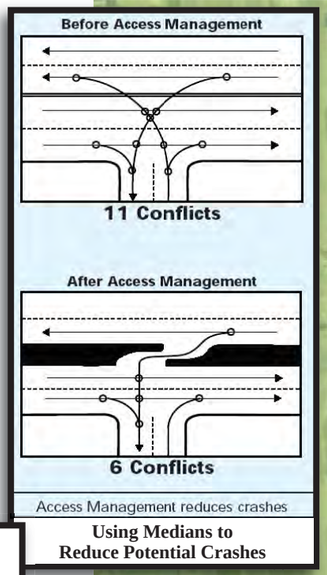
Example of Crash Involving Left-Turn Movement from Driveway

How does access management improve safety?



Types of Traffic Conflicts

Each access point creates potential conflicts between through traffic and traffic using that access. Each conflict is a potential crash. **Access management improves safety by separating access points so that turning and crossing movements occur at fewer locations.** This allows drivers passing through an area to predict where other drivers will turn and cross, and also provides space to add turn lanes.



Using Medians to Reduce Potential Crashes

The figure to the right shows how basic changes in access design, such as incorporating a median or changing a full median opening to a directional opening, can reduce traffic conflicts and the potential for crashes.

If crashes and congestion become frequent on your roadway, people will seek out other routes. Bear in mind that a single crash can tie up traffic and potential customers for hours.

What about congestion and the effect it has on my market area?

Access management not only improves roadway safety, it also helps reduce the growing problem of traffic congestion. Frequent access and closely spaced signals increase congestion on major roads. **As congestion increases, so does delay, which is bad for the economy and frustrating to your customers.** Well-managed arterials can operate at speeds well above poorly managed roadways – up to 15 to 20 miles per hour faster. **This means more traffic past your door and better exposure for your business. It also means a more convenient shopping experience for your customers.**

How will a change in access affect the success of my business?

To address this question, it's important to first determine the type of business that you own – drive-by or destination.

- **"Destination businesses"** are businesses that customers plan to visit in advance of the trip. Examples include electronics stores, doctor or dentist offices (in fact most offices), major retailers, insurance agencies, sit down restaurants, etc.

- **"Drive-by businesses"** are those that customers frequent more on impulse or while driving by, such as convenience stores, gas stations, or fast food restaurants.

If you own a drive-by business, your clients will expect to get in and out easily from the highway. For you, the critical issues are *visibility*, *signage*, and *convenient access*. If your site is relatively small, a driveway connecting to the highway may not be your best option. A driveway on a highway service road or a private circulation lane serving several properties can increase the convenience of your access and the volume of customers you can accommodate. Convenient access can be provided by periodic connections between the service road and the highway, or through the shared private access points. Short driveways or open frontages not only cause safety hazards for pedestrians and traffic, but have less capacity than local roads or long driveways.

Access management has no impact on the demand for goods and services.

"Our business has increased about 20% in customer count."

— C. Randy Rosenburger of City Looks in Ankeny Iowa.

If you are the owner of a destination business, your customers are planning their trips in advance. A driveway on a congested highway or a highway that is perceived as unsafe may actually intimidate customers from making the trip. Most small destination businesses or specialty stores benefit more from access to a lower speed minor road, such as a neighborhood collector road. The greater exposure that a major road provides is an advantage for larger destination businesses, but it's a good idea to have access from more than one roadway. Allowing customers to enter and exit from different directions will increase safety and convenience.

So what's the bottom line on access management?

Efforts by government agencies to manage access in site development and road projects can help businesses, even those operating on older highway corridors, in a variety of ways. Here are some specific benefits to you and your customers:

- **Fewer roadway delays and better traffic flow will result, which will preserve and possibly even enhance the market reach of businesses in your corridor;**
- Safer approaches to businesses result from installation of medians, which can also be landscaped to improve the image of the area;
- Properly designed entrances shared by multiple businesses allow more site area for parking, more customer options to access your site, and improved landscaping or other site amenities;
- Service roads along the highway allow customers to enter and exit businesses conveniently and safely, away from faster moving through-traffic;
- Internal connections between businesses allow customers to circulate easily, without reentering a busy road; and/or
- Driveways and service road entrances farther away from signalized intersections allow easy access for customers, even during times of peak congestion.

"It has been a very positive thing all the way around, from the economic, and the community sides. We have improved our tax base, we have improved our traffic problem, and plus we have improved our business community."

— Chuck Fisher, Supt. Public Works Ankeny, Iowa

In brief, minimizing the number of curb cuts, consolidating driveways, constructing landscaped medians, and coordinating internal site circulation and parking among several businesses results in a visually pleasing and more functional corridor. That protects your investment in your business, the public investment in the roadway, and can even help attract new investment into the area.

"There are a lot of beautification projects going on, tree plantings and what have you. I think the landscaping in the medians has very much added to the very nice decorum of Ankeny. It will make a nice impression for those visiting Ankeny, or living here."

— Andy Kasper, Iowa Realty, Ankeny, Iowa

What are the other issues with frontage or service roads?

- **Service roads that run behind highway properties are often less disruptive to existing businesses than frontage roads, less costly for an agency, and more functional than a frontage road.**
- Rear service roads can provide access to businesses on each side and can operate safely from both directions. Frontage roads provide access only to businesses fronting on the highway and are much safer when designed for one-way traffic.
- Additional right-of-way will be needed for the frontage or service road and for connecting a service road back to the highway or side street. If your site will be impacted, it is important to work with the agency on how to reduce adverse effects. For example, if your site becomes nonconforming under local zoning regulations because of a smaller setback or other change, ask the local agency if they will waive that status, given that it was caused by a government right-of-way taking.

What are other commonly used access management techniques?

Regulate minimum spacing of median openings and access connections (driveways and street connections).	Limit the number of access points per property, or consolidating access points and encouraging shared driveways.	Establish standards for driveway width, driveway throat length and internal drive aisles to move traffic smoothly off of the adjacent street.
Move access points away from signalized intersections and freeway ramps.	Incorporate right- and left-turn lanes into roadways.	Close or replace a full median opening with a directional opening.
Provide a service road or parallel collector roads and side streets for site access along an arterial roadway.	Promote interconnection of parking lots and unified on-site circulation systems.	Install a median on an undivided roadway or replace a continuous two-way left-turn lane with a median.

How important is access to the success of my business?

Location and access are factors, but not the most important factors that determine whether businesses succeed or fail. The main reason that businesses fail is lack of management expertise *(3)*. The main reasons that businesses succeed include *(4)*:

- the experience of management,
- how well customers are served,
- the quality of the product or service provided,
- adequate financing and investment,
- well-trained employees,
- the level and nature of competition, and
- keeping costs competitive.

Given that access is not the primary reason that businesses survive or fail, it follows that a change in access will not be the primary cause of whether a business will survive or fail. In fact, access is one of the lesser factors that customers will consider when weighed against price, service, product, and store amenities.

This is not to say that good access is not important to your business. **Whether your business is large or small, it is important that you can handle customer traffic demand.** If you operate or develop major retail centers, factories, or campuses, proper location and design of access is essential to customers and employees. For shopping centers, the Urban Land Institute's Shopping Center Development Handbook states "poorly designed entrances and exits not only present a traffic hazard, but also cause congestion that can create a negative image of the center *(5)*."This is also true for small businesses, especially those on the intersection of busy roads. If your business is difficult or unsafe to enter or exit, then customers may be dissuaded from visiting.

Just think about the roads in your community where access has been carefully planned and compare them to those having lots of driveways, open frontages, and no median. Which roads do you prefer to travel on and which corridors have the most vibrant businesses?

Small corner properties are more difficult to access.

This queue is blocking street traffic and additional customers

Is this a sign of a store doing great business, or one that is telling customers to try the next guy down the street?

What has been the impact to businesses where this type of thing has been done?

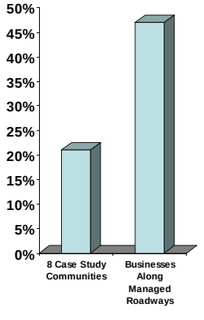
Studies of the business impacts of access management projects in Florida, Iowa, Minnesota, Kansas and Texas have consistently found that most businesses continue to do well when the project is completed. These results are particularly true for destination businesses. However, most drive-by oriented businesses are not unduly affected either. Drive-by businesses have been adversely affected by reconstruction projects that reduce their visibility from the major road or cause them to have highly circuitous or inconvenient access. However, these are not typical impacts of access management projects and where they do occur, it is not uncommon for transportation agencies to compensate business owners for losses.

Business activity: Access management projects alone do not appear to increase or decrease business failure rates *(6)*. This makes sense considering that many factors other than highway access can affect business success. **"Before and after" studies of businesses in Florida, Iowa, Minnesota, and Texas along highways where access has been managed found that the vast majority of businesses do as well or better after the access management projects are completed.** The turnover rate (the proportion of businesses that close or move out each year) of businesses in Iowa and Minnesota was studied along newly access-managed corridors and was similar to or lower than that of the surrounding area. For example:

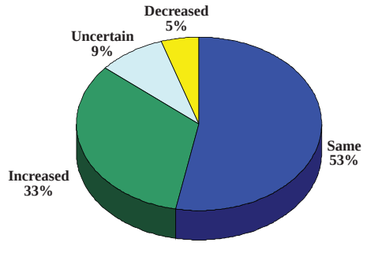
Businesses affected by access management projects in Iowa tended to do at least as well in terms of growth in retail sales, but usually better than those in surrounding communities, after the projects were completed. Most of these Iowa business proprietors said that sales were similar or greater following the completion of the projects. Only five percent reported a sales decrease *(6)*.

Impact of Access Management on Retail Sales Growth

- In the 1990s, retail businesses along eight recently access managed roadways in Iowa were compared to their surrounding communities.
- The businesses along the managed corridors experienced much higher retail sales growth during the decade than those businesses in other locations in these eight communities.



Business Proprietors' Reported Sales Comparisons



FRONTAGE or SERVICE ROADS

A *frontage road* is a type of service road that parallels a major road or freeway and is located between the road and building sites abutting the road. *Service roads* can also run behind businesses.

The purpose of these roads is to provide lower-speed access to commercial sites along a major roadway and to separate business traffic from higher-speed through traffic. Connections of frontage or service roads to side streets or onto the highway must be well away from signalized intersections, so entering and exiting traffic doesn't conflict with traffic queuing at signals.

Rear service roads providing access to highway commercial properties.

A frontage road.

How will I get access while I'm waiting for a frontage or service road to be finished?

Some sites may need to be given temporary access to the major roadway until the service road system is complete. This is typically needed when a service road is being constructed in segments through the development process, rather than built by a transportation agency as part of a road construction project. Most agencies will require you to remove your temporary driveway and build a driveway to the frontage or service road at a later time, so it's important to design your site access and circulation to accommodate that change.

How will people know how to get to my business from the highway?

Frontage roads maintain good visibility for businesses along a major road and typically it is apparent how to enter and exit the road to get to a business. Points of entry can be signed to identify businesses that can be accessed from that entrance, if it is not already apparent. **It's a good idea to provide signs where a service road or frontage road connects at a side street, so customers know they can obtain access** to businesses that may not be visible from the side street.

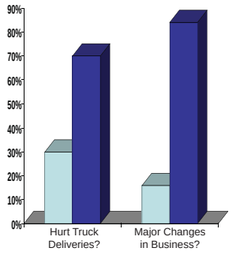
Why not just signalize all median openings and high volume driveways?

The decision on whether or not to signalize a median opening or access point depends on many factors, including the volume of traffic using the access, the proximity of other traffic signals, and the potential impact on public safety and traffic congestion. Most signal warrants are related to traffic volumes, but some consider school crossings, crash history, pedestrian crossings, "factory" peaks, and other situations. Unwarranted signals cause undue delays as motorists wait at a red light while little or no cross traffic exists. Worse, unwarranted signals may eventually be disobeyed or ignored by frustrated motorists who are only one reckless incident away from causing an accident or emerging as a casualty themselves. For these reasons, median openings and driveways should not be signalized where they do not meet the requirements of a traffic signal study.

What about impacts on truck deliveries?

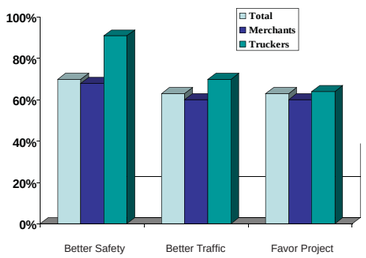
The limited number of before-and-after studies have found that truck deliveries may be inconvenienced, at worst, but may in fact benefit from improved opportunities resulting from a change in access. And while the actual studies may be few, the anecdotal comments are many and favorable.

Merchant opinions of median changes on Oakland Park Blvd., Florida



96 Merchants Responded

Merchant and trucker opinions about a median project in Ft. Lauderdale, Florida



What are the other issues with medians and median opening closures?

- Alternative access through side streets, service roads, or internal connections with neighboring developments helps increase accessibility on busy or median separated roads – especially if the result allows several properties access to a signal.
- Minor roadway improvements, such as additional pavement on the shoulder, may be needed to accommodate U-turning traffic.
- Some trucks and large vehicles may need to take alternate routes as U-turns can be difficult to negotiate.
- Medians can be landscaped to enhance the image of an area and help attract investment and customers.

Business owners report that the actual impacts to their businesses were much less than they anticipated. Most adverse impacts were due to construction and not to access changes.

"If anything, our business has increased, which very much surprised me."

— D. Stanley Tripp of Tripp's Auto Sales in Spencer, Iowa

Property values: Most property owners surveyed following an access management project do not report any adverse effect of the project on property values. Often, such projects can have a positive effect by cleaning up the patchwork of driveways and curb cuts. For example:

A study of property values on **Texas** corridors with access management projects found that land values stayed the same or increased, with very few exceptions *(7)*.	More than 70% of the businesses impacted by a project in **Florida** involving several median opening closures reported no change in property value, while 13% reported some increase in value *(8)*.
A 2005 study of commercial property values along a major access management project in **Minnesota** found that property values depend more on the strength of the local economy and the general location of the property in the metropolitan area; changes in access seemed to have little or no effect on the value of parcels *(9)*.	A study of **Kansas** properties impacted by access changes found that the majority were suitable for the same types of commercial uses after the access management project was completed. This was true even for businesses that had direct access before the project and access only via frontage roads after project completion *(10)*.

Customers and deliveries: The majority of customers and truck drivers surveyed in before-and-after studies have reacted positively to access management projects as improving both safety and traffic flow. Business customers surveyed about access management projects in Iowa, Texas and Florida overwhelmingly supported the projects because their drive became quicker, easier and safer *(6)*.

What are some common types of access management projects and what are the impacts?

There are many access management techniques, each with a specific purpose and different type of impact. One common type of access change is the building of a **median** on a road or closing existing median openings. Another common type of project is providing a **frontage road** or a rear service road along a highway for access to businesses. Below is an overview of these strategies, the types of issues or impacts associated with these projects, and how you can work with the agency to adjust to these changes.

MEDIANS and MEDIAN OPENINGS

A *median* is a grass or raised divider in the center of a road that separates opposing traffic and discourages or prevents vehicles from crossing the divider.

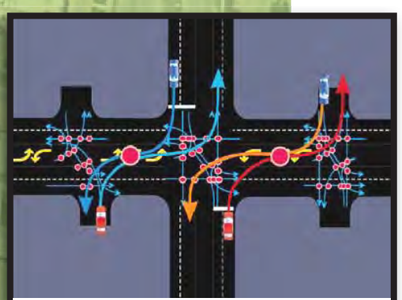
Openings in the median provide for different turning or crossing maneuvers, depending on how they are designed.

- A ***directional median opening*** only allows certain movements, usually a left-turn in or U-turn.
- A ***full median opening*** allows all turning and crossing movements and is often signalized.

Where too many full median openings exist, agencies may reconstruct the median and close the excess median openings.

Turn lanes at median openings provide a safe haven for turning vehicles.

Why use a median and not a two-way left turn lane?



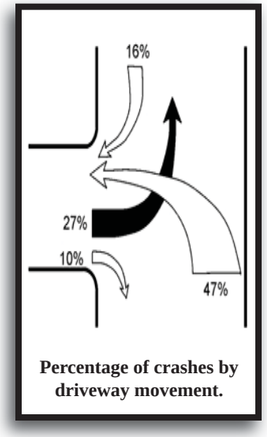
Conflicts and potential crashes associated with continuous two-way left turn lanes

Medians can have a profound effect on driver safety compared to two-way left-turn lanes. Adding a median to a road that previously had a continuous two-way left turn lane can reduce the crash rate about 37% and the injury rate about 48% *(11)*. **For example, when a continuous two-way left turn lane was replaced with a median on Atlanta's Memorial Drive, the crash rate was cut in half *(12)*.**

One reason a two-way left turn lane is less safe than a median is that a driver who is turning left must be able to ensure that the traffic is clear from two directions in multiple lanes. When this is not quite possible, drivers will sometimes use a two-way left-turn lane in the middle of the road while attempting to merge into traffic. Such maneuvers can lead to serious crashes and become more frequent as traffic volumes increase.

Won't I lose customers if they can't turn left into my business anymore?

The number of your customers making left turns into your business is likely already very low during peak travel periods or if you are on a congested roadway. This is because left turns into any business become increasingly difficult as traffic volumes in the opposing lanes increase.



Percentage of crashes by driveway movement.

Perhaps today your customers wait with apprehension to turn left as cars queue behind them, or must shoot across a busy road to complete a left turn out. A turn lane at a median opening or signalized intersection will allow them to wait safely to complete a U-turn when traffic clears, and that is truly a safer option on a busy road. **In fact, the left-turn into and out of a driveway is less safe than a U-turn and comprises the majority of driveway crashes.** Studies have shown that making a U-turn at a median opening to get to the opposite side of a busy highway is about 25% safer than a direct left turn from a side street or other access point *(13)*.

Surveys show that a majority of drivers have no problem making U-turns at median openings to get to businesses on the opposite side of the road. Where direct left-turns are prohibited, studies show that motorists will change their driving or shopping patterns to continue patronizing specific establishments. In fact, most drivers are reporting that access management improvements made the roads safer and that they approve of the changes, despite minor inconveniences associated with U-turns.

Some owners of drive-by businesses have reported a loss of customers following a median project or other change that has eliminated the left-turn-in opportunity (and less often left-turn-out), although the majority do not. For example, a before-and-after study of a median reconstruction project in Florida involving numerous median-opening closures found that **the majority of surveyed merchants, 68% of the 96 respondents, reported little or no economic impact to their businesses, although 27% reported some type of loss *(14)*.** Generally, businesses that feel they were adversely impacted also have competition nearby or may have experienced reduced visibility of signage.

> "Because of the design of the roads, the timing of the traffic signals, and the way the traffic is broken up, it has become very convenient for people to pull into a safe haven, or storage lane within the raised median, take their time and make a safe and convenient u-turn to access properties that were concerned about that problem."
>
> **— Kurt Easton, Executive Director of Merritt Island Redevelopment Agency, Florida**

ACCESS SPACING

Signal Spacing

Signals Per Mile	Increase in Travel Time (%)
2	-
3	9
4	16
5	23
6	29
7	34
8	39

Increasing the distance between traffic signals improves the flow of traffic on major arterials, reduces congestion, and improves air quality for heavily traveled corridors. The appropriate spacing between signals for a particular corridor depends greatly upon the speed and flow of traffic, but anything greater than two signals per mile has a significant impact on congestion and safety.

A major synthesis of research on access management found that each additional signal over two per mile (i.e., a one-half mile signal spacing) increased travel time by over six percent. [4] A study of an intersection in Cincinnati where a signal was added found a 20 percent increase in peak travel times. [11]

A demonstration project in Colorado revealed that half mile signal spacing and raised medians on a five-mile roadway segment reduced total hours of vehicle travel by 42 percent and total hours of delay by 59 percent, compared to quarter mile signal spacing. [1]

Signals Per Mile	Crashes Per Million VMT
Under 2	3.53
2 to 4	6.89
4 to 6	7.49
6 +	9.11

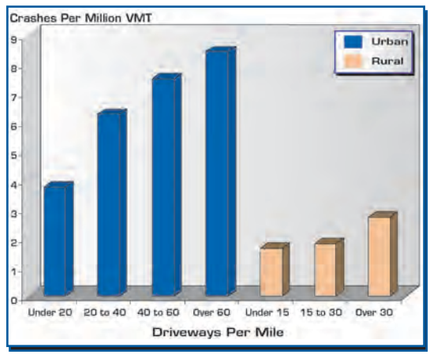
Improved speeds and travel times translate directly into environmental benefits. An ongoing study in Texas found that a ten mile four-lane arterial with one-half mile signal spacing reduced fuel consumption by 240,000 gallons from increased speed and 335,000 gallons from reduced delay, compared to quarter mile signal spacing. [14]

Increasing the distance between signals also reduces the incidence of crashes. A review of crash data from seven states demonstrated that the crash rate increased substantially with additional signals per mile. [4] This is partly related to access spacing, which is presented next.

Driveway Spacing

Appropriate driveway spacing presents another major access issue. Large numbers of driveways increase the potential conflicts on the road. Fewer driveways spaced further apart allow for more orderly merging of traffic and present fewer challenges to drivers.

The congestion impacts of reduced driveways are fairly clear. It is impossible for a major arterial or highway to maintain free flow speeds with numerous access points that add slow moving vehicles. A research synthesis found that roadway speeds were reduced an average of 2.5 miles per hour for every 10 access points per mile, up to a maximum of a 10 miles per hour reduction (at 40 access points per mile). [4] With higher numbers of access points, congestion will increase significantly.



An overabundance of driveways also increases the rate of car crashes. An examination of crash data in seven states indicated found a strong linear relationship between the number of crashes and the number of driveways. Rural areas had a similar, but less strong relationship. [4,7]

RELATED TECHNIQUES

Access management includes more techniques than can be discussed in a single brochure. Some of these techniques are newer and have been researched somewhat less. Frontage roads have been the subject of some debate in the literature, but there is no clear indication of their benefits. Other techniques, such as the relationship between highway interchange spacing and local traffic, are new topics that require more research.

Many cities and states develop access management programs to deal with existing issues of congestion and safety. An active access management program, however, would need to include changes to local land use policies that encourage the rational development of major roads. In newly developing areas, land use and zoning controls that limit the number of access points and leave space for median improvements can save money and effort as these areas develop.

TURNING LANES

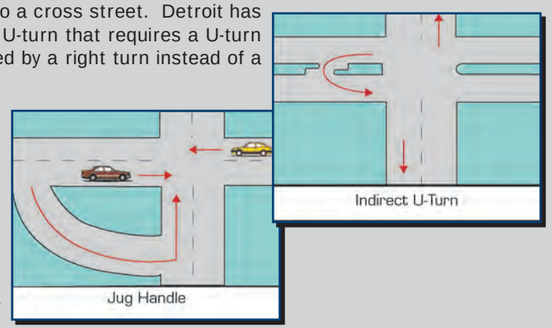
Left Turns

Exclusive turning lanes for vehicles remove stopped vehicles from through traffic. Left-turn lanes at intersections substantially reduce rear-end crashes. A major synthesis of research on left-turn lanes demonstrated that exclusive turn lanes reduce crashes between 18 to 77 percent (50 percent average) and reduce rear-end collisions between 60 and 88 percent. [4]

Left-turn lanes also substantially increase the capacity of many roadways. A shared left-turn and through lane has about 40 to 60 percent the capacity of a standard through lane. [4]. A synthesis of research on this topic found a 25 percent increase in capacity, on average, for roadways that added a left-turn lane. [13]

Indirect Turns

Some of the biggest issues with managing access come at intersections where vehicles must cross traffic. Some states and cities have adopted indirect turns to reduce these conflicts. In New Jersey, the jug-handle left turn requires a right turn onto a feeder street, followed by a left onto a cross street. Detroit has extensively used an indirect U-turn that requires a U-turn past an intersection, followed by a right turn instead of a regular left turn.



Like dedicated left-turn lanes, indirect turns reduce crashes, improve congestion, and add capacity. Crashes decline by 20 percent on average, and 35 percent if the indirect turn intersection is signalized. Capacity typically shows a 15 to 20 percent gain. [4]

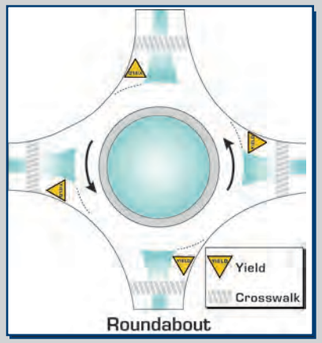
Right Turns

Right-Turning Vehicles Per Hour	Through Vehicles Impacted (%)
Under 30	2.4
31 to 61	7.5
61 to 90	12.2
90 and up	21.8

Right-turn lanes typically have a less substantial impact on crashes and roadway capacity than other types of turn strategies, because there are fewer limitations on right turns. Though there are fewer studies of these impacts, there is a clear relationship between the number of vehicles attempting a right turn in a through traffic lane and its delay to through traffic. This relationship is exponential – each additional car that must wait for a right turn will increase the delay more than the previous car. At intersections with substantial right-turn movements, a dedicated right-turn lane segregates these cars from through traffic and increases the capacity of the road.

Roundabouts

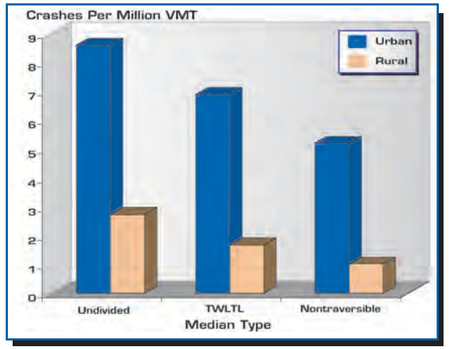
Roundabouts represent a potential solution for intersections with many conflict points. Though not appropriate for all situations, roundabouts reduce vehicle movements across traffic. Only a few studies have examined the safety benefits of roundabouts. One study of four intersections that were replaced with roundabouts in Maryland found a drop in crashes between 18 and 29 percent and a reduction in injury crashes between 63 and 88 percent. The cost of crashes at these locations – one measure of severity – was also reduced by 68 percent. Overall crashes on roundabouts were more minor than those at left turn locations. [9] Another study of roundabouts in several locations found a 51 percent reduction in crashes, including a 73 percent reduction in injury crashes and a 32 percent reduction in property-damage-only crashes for single-lane roundabouts. Multi-lane roundabouts only experienced a 29 percent reduction in crashes. [6]



MEDIAN TREATMENTS

Medians

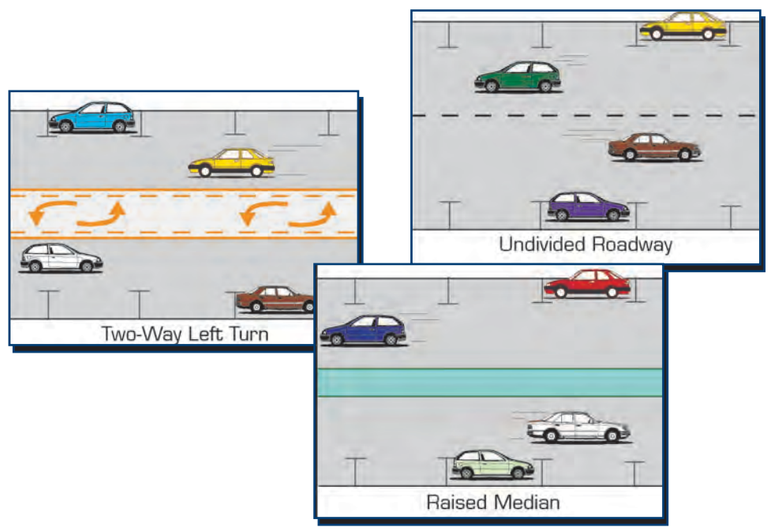
Median treatments for roadways represent one of the most effective means to regulate access, but are also the most controversial. The two major median treatments include two-way left turn lanes (TWLTL) and raised medians.



The safety benefits of median improvements have been the subject of numerous studies and syntheses. Studies of both particular corridors and comparative research on different types of median treatments indicate the significant safety benefits from access management techniques. According to an analysis of crash data in seven states, raised medians reduce crashes by over 40 percent in urban areas and over 60 percent in rural areas. [4]

A study of corridors in several cities in Iowa found that two-way left-turn lanes reduced crashes by as much as 70 percent, improved level of service by one full grade in some areas, and increased lane capacity by as much as 36 percent. [5]

Raised medians also provide extra protection for pedestrians. A study of median treatments in Georgia found that raised medians reduced pedestrian-involved crashes by 45 percent and fatalities by 78 percent, compared to two-way left-turn lanes. [12]



Business Concerns

Installing raised medians often raises serious concerns by the business community that local businesses that depend upon pass-by traffic (especially gas stations and fast-food restaurants [10]) will be adversely affected by medians. Though there are few studies of the actual impacts of medians on business sales, there are several surveys of business owner opinions. Surveys conducted in multiple corridors in Texas, Iowa, and Florida demonstrate that the vast majority of business owners believe there have been no declines in sales, with some believing there are actually improvements in business sales. [2,5,8] One study in Texas indicated that corridors with access control improvements experienced an 18 percent increase in property values after construction. [2]

Location	Owners Report No Decline in Business (%)
Texas (2)	93
Texas (3)	78 to 84
Iowa (5)	67 to 91

PURPOSE OF THE BROCHURE

This brochure serves as a guide to the major benefits of several access management techniques in use across the United States. The purpose of this brochure is to provide a comprehensive and succinct examination of the benefits of access management and address major concerns that are often raised about access management.

The benefits usually identified with access management include improved movement of through traffic, reduced crashes, and fewer vehicle conflicts. Most major concerns about access management relate to potential reductions in revenue to local businesses that depend on pass-by traffic.

This brochure does not describe the precise strategies that transportation departments should follow to implement an access management program, but rather provides an introduction to the key concepts. The brochure may also be a useful tool to distribute at public meetings for both general access management plans and specific applications of access management techniques.

This brochure describes the relevant benefits and issues with three key sets of access management techniques:

1. Access spacing, including spacing between signalized intersections and distance between driveways;
2. Turning lanes, including dedicated left- and right-turn lanes, as well as indirect left turns and U-turns, and roundabouts; and
3. Median treatments, including two-way left-turn lanes and raised medians.

WHAT IS ACCESS MANAGEMENT?

Access management is a set of techniques that state and local governments can use to control access to highways, major arterials, and other roadways. Access management includes several techniques that are designed to increase the capacity of these roads, manage congestion, and reduce crashes.

- Increasing spacing between signals and interchanges;
- Driveway location, spacing, and design;
- Use of exclusive turning lanes;
- Median treatments, including two-way left turn lanes (TWLTL) that allow turn movements in multiple directions from a center lane and raised medians that prevent movements across a roadway;
- Use of service and frontage roads; and
- Land use policies that limit right-of-way access to highways.

State, regional, and local governments across the United States use access management policies to preserve the functionality of their roadway systems. This is often done by designating an appropriate level of access control for each of a variety of facilities. Local residential roads are allowed full access, while major highways and freeways allow very little. In between are a series of road types that require standards to help ensure the free flow of traffic and minimize crashes, while still allowing access to major businesses and other land uses along a road,

CITATIONS

[1] Colorado Department of Highways, 1985, Final Report of the Colorado Access Control Demonstration Project, Colorado.

[2] Eisele, W. E., and W. E. Frawley, 1999, A Methodology for Determining Economic Impacts of Raised Medians: Data Analysis on Additional Case Studies, Research Report 3904-3, Texas Transportation Institute, College Station, Texas, October.

[3] Frawley, W. E., and W. E. Eisele, 1998, A Methodology to Determine Economic Impacts of Raised Medians on Adjacent Businesses, 1998 National Conference on Access Management.

[4] Gluck, J., H. S. Levinson, and V. Stover, 1999, Impacts of Access Management Techniques, NCHRP Report 420, Transportation Research Board.

[5] Iowa Department of Transportation, 1997, Access Management Research and Awareness Program: Phase II Report.

[6] Jacquemart, G., 1998, Synthesis of Highway Practice 264: Modern Roundabout Practice in the United States, National Cooperative Highway Research Program, National Academy Press, Washington, D.C.

[7] Lall, B. K., D. Huntington, and A. Eghtedari, 1996, Access Management and Traffic Safety, Paper presented at the Second Annual Access Management Conference.

[8] Long, G, C.T. Gan, and B.S. Morrison. "Impacts of Selected Median and Access Design Features." Florida Department of Transportation Report, Transportation Research Center, University of Florida, May 1993.

[9] Meyers, E. J., 1999, Accident Reduction with Roundabouts, Paper presented at the 69th Annual ITE Meeting, Las Vegas, Nevada.

[10] Neuwirth, R. M., G. E. Weisbrod, and S. D. Decker. 1993, Methodology for Evaluation Economic Impacts of Restricting Left Turns, Paper presented at the First Annual Access Management Conference.

[11] Pant, P. D., M.D., S. Ula, and Y. Liu, 1998, Methodology for Assessing the Effectiveness of Access Management Techniques, Final Report, prepared for the Ohio Department of Transportation.

[12] Parsonson, P. S., M. G. Waters III, and J. S. Fincher, 2000, Georgia Study Confirms the Continuing Safety Advantage of Raised Medians Over Two-Way Left-Turn Lanes, presented at the Fourth National Conference on Access Management, Portland, Oregon.

[13] S/K Transportation Consultants, Inc., 2000, National Highway Institute Course Number 133078: Access Management, Location, and Design, April.

[14] Texas Transportation Institute, In Progress, An Evaluation of Strategies for Improving Transportation Mobility and Energy Efficiency in Urban Areas, Texas A&M University, Project 60011.

FOR MORE INFORMATION

http: / / www.accessmanagement.gov

FHWA Document Number FHWA-OP-03-066

Benefits of Access Management

U.S. Department of Transportation
Federal Highway Administration

NATIONAL ACCESS MANAGEMENT INFORMATIONAL MATERIALS

The following materials have been developed by the Federal Highway Administration and the Transportation Research Board to summarize the benefits of access management as well as educate the tools available to implement these systems. Three sources follow.

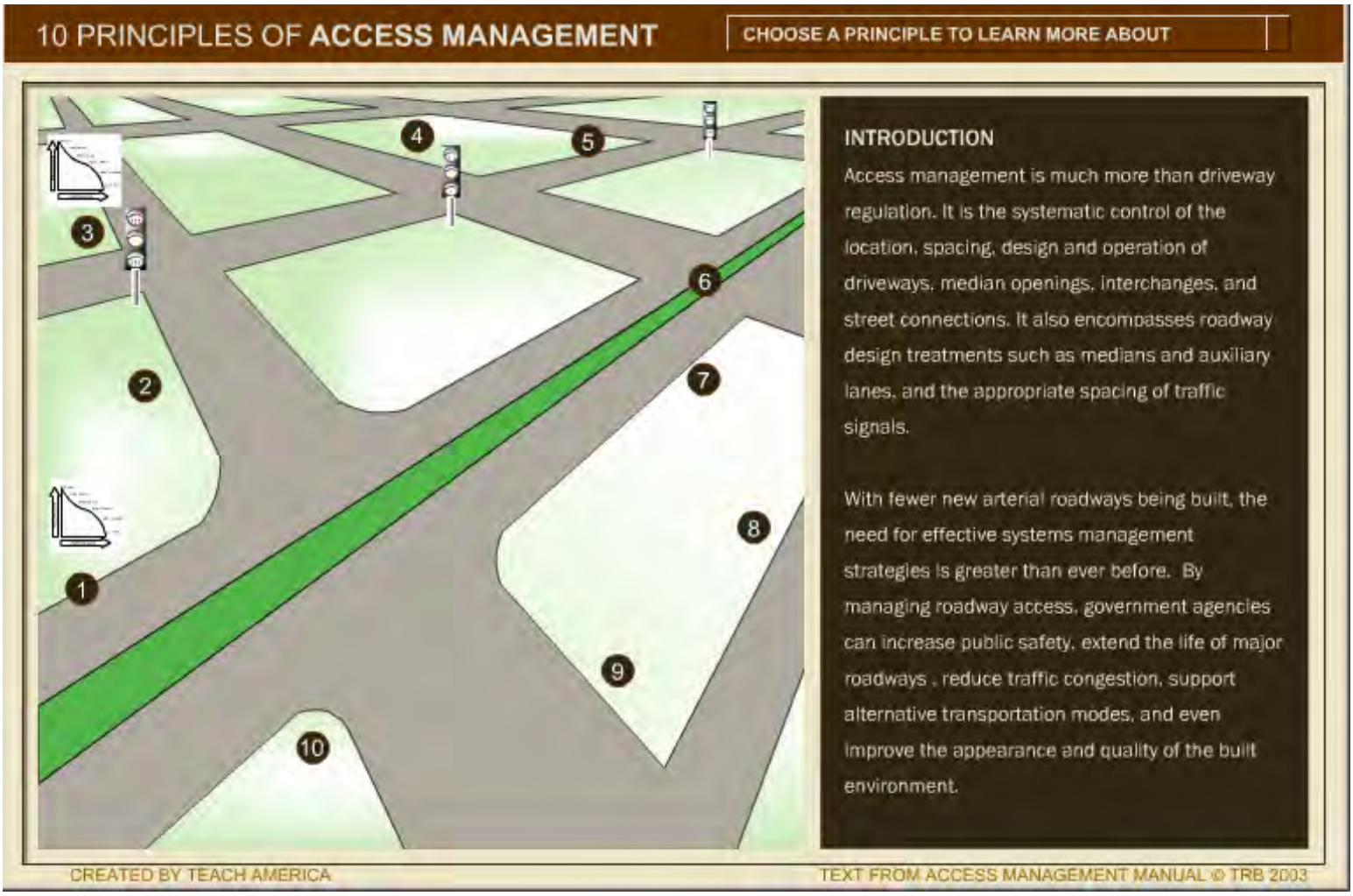
The Benefits of Access Management brochure was prepared by the Federal Highway Administration. It describes some of the most common access management techniques using easy to understand graphics and describes their benefits. This brochure is an excellent quick overview of access management.

Ten Ways to Manage Roadway Access in Your Community was developed by the Center for Urban Transportation Research and contains 10 practical steps for implementing access management. The graphics are helpful and clear and the steps focus on ways to improve access management through land use regulations.

The National Principles of Access Management provides information on controlling access from a roadway management perspective. These slides were developed by Teach America for the Transportation Research Board and are available at their website as animation flash files: http://www.accessmanagement.gov.

National Principles of Access Management

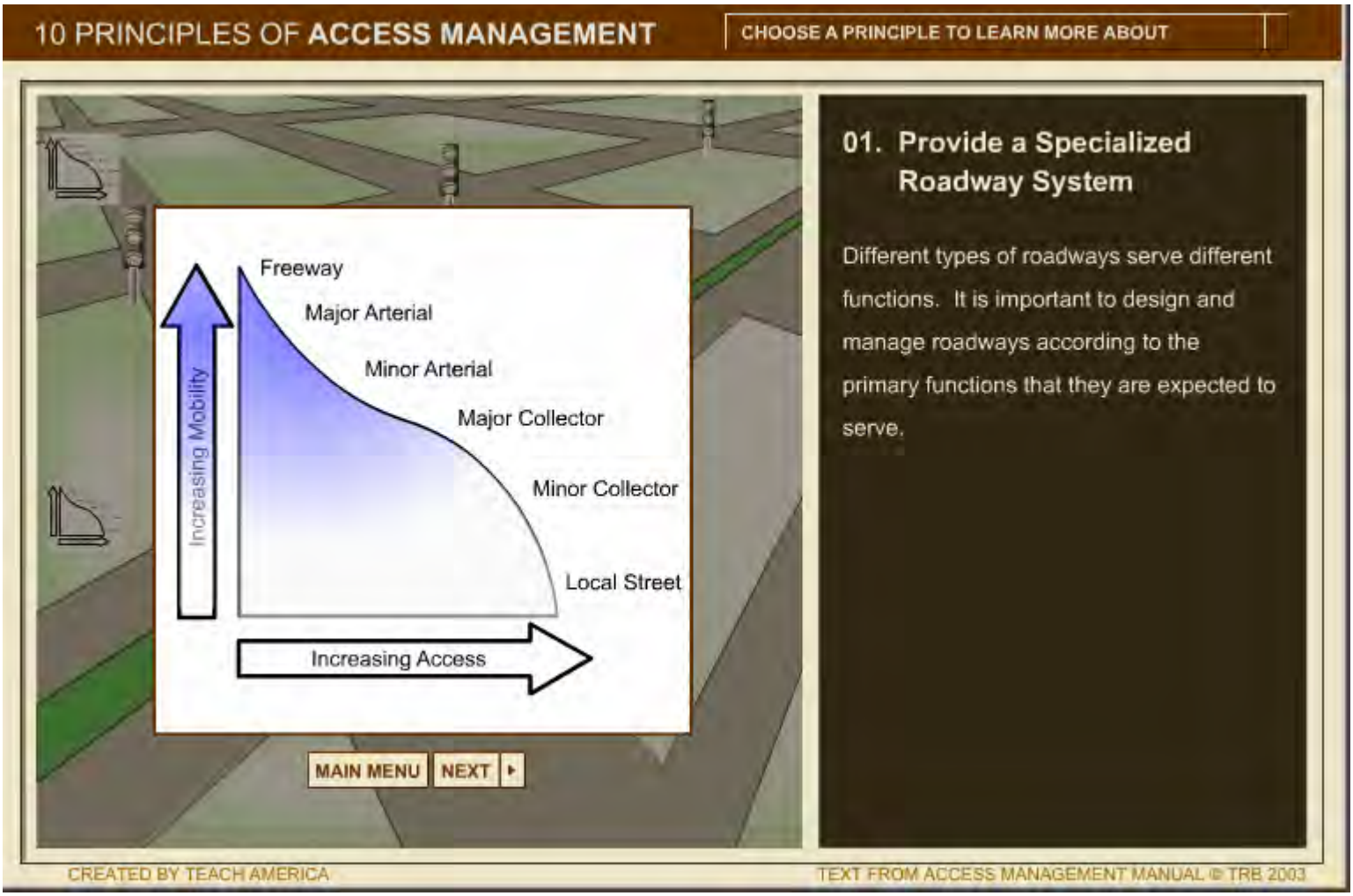
Introduction



[The full animation is available at http://www.accessmanagement.gov]

National Principles of Access Management

Specialized Road System



[The full animation is available at http://www.accessmanagement.gov]

National Principles of Access Management

Limit Direct Access

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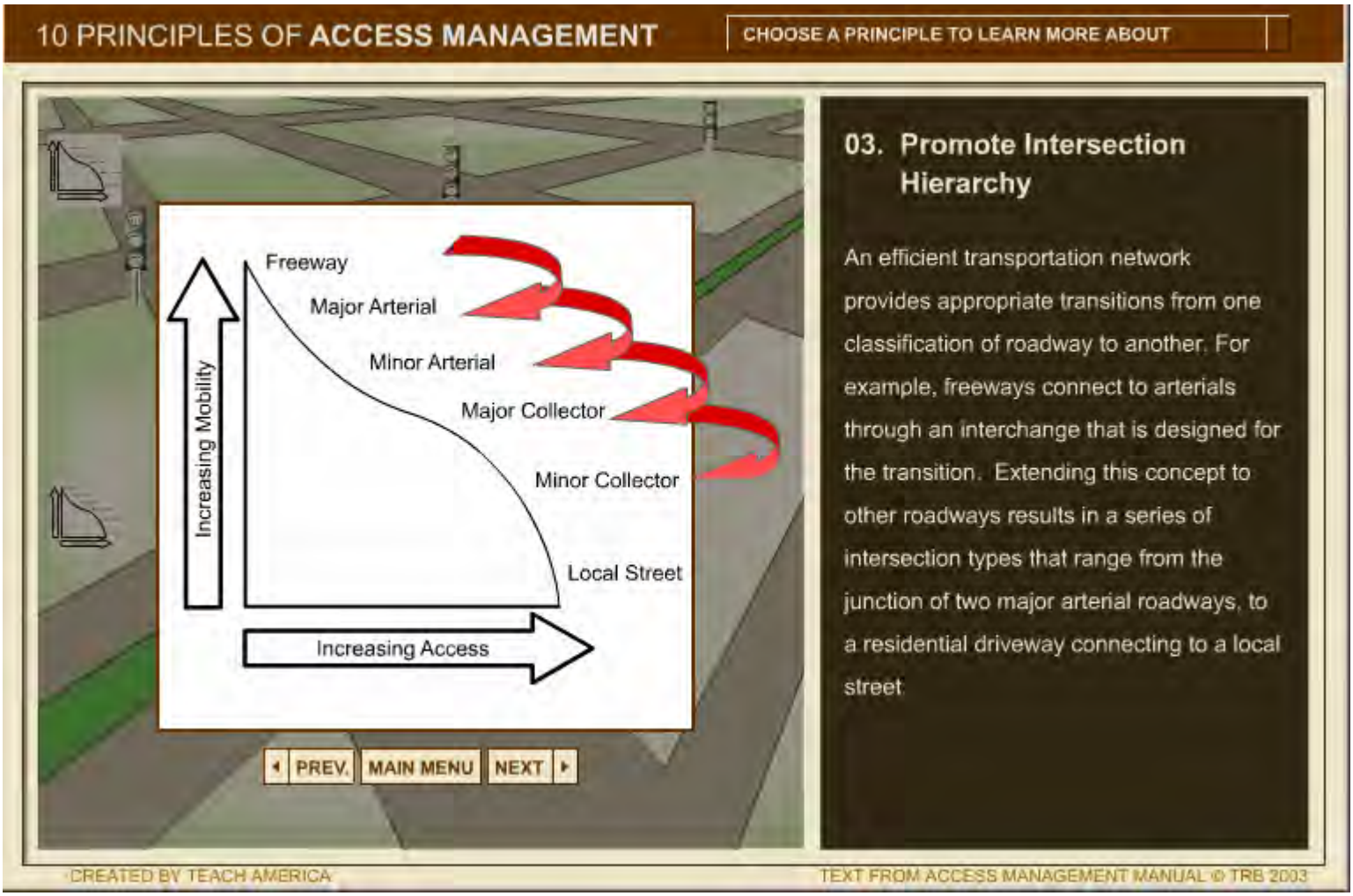
National Principles of Access Management

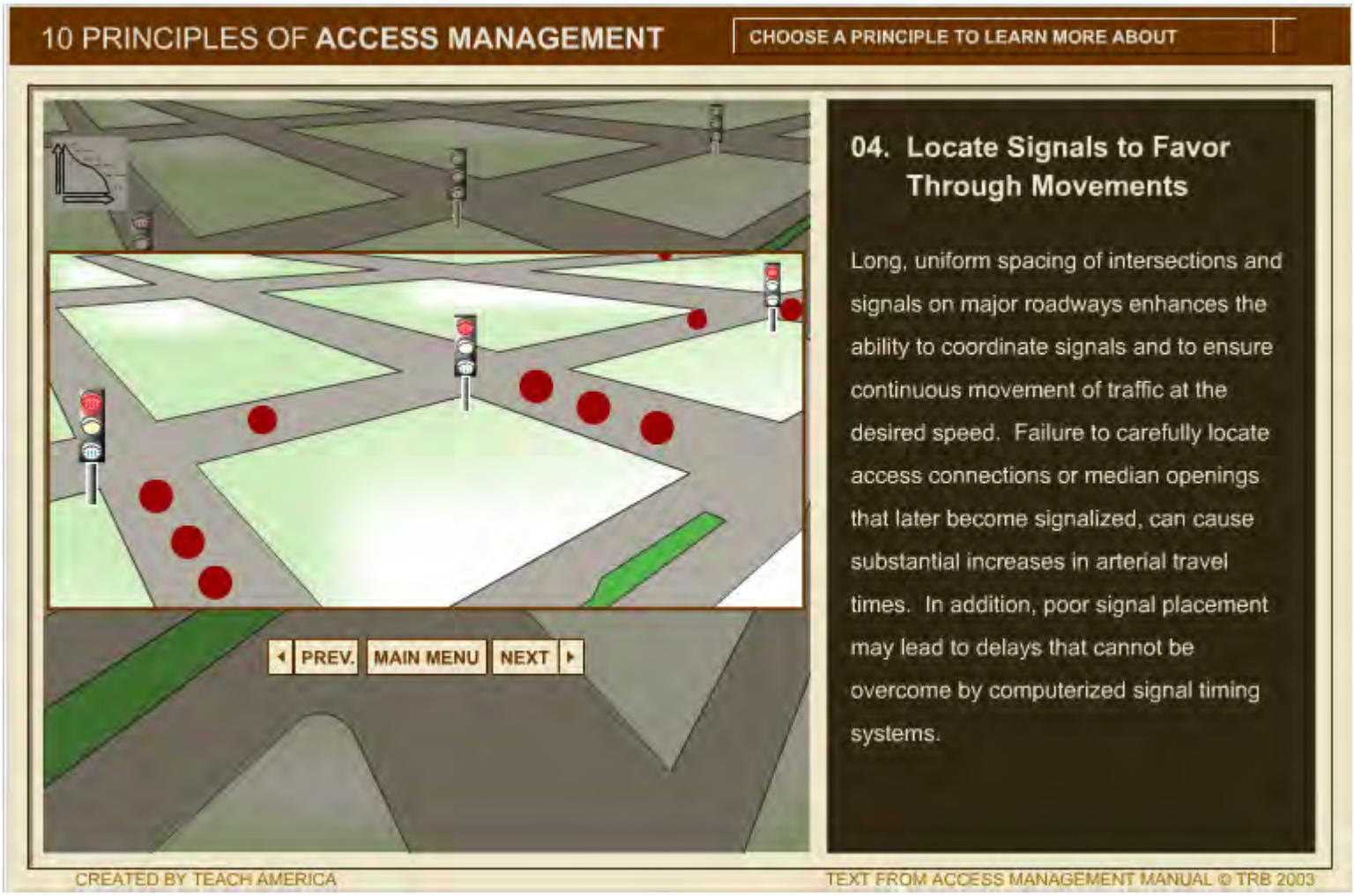
Promote Intersection Hierarchy



[The full animation is available at http://www.accessmanagement.gov]

National Principles of Access Management

Locate Signals to Favor Through Movements



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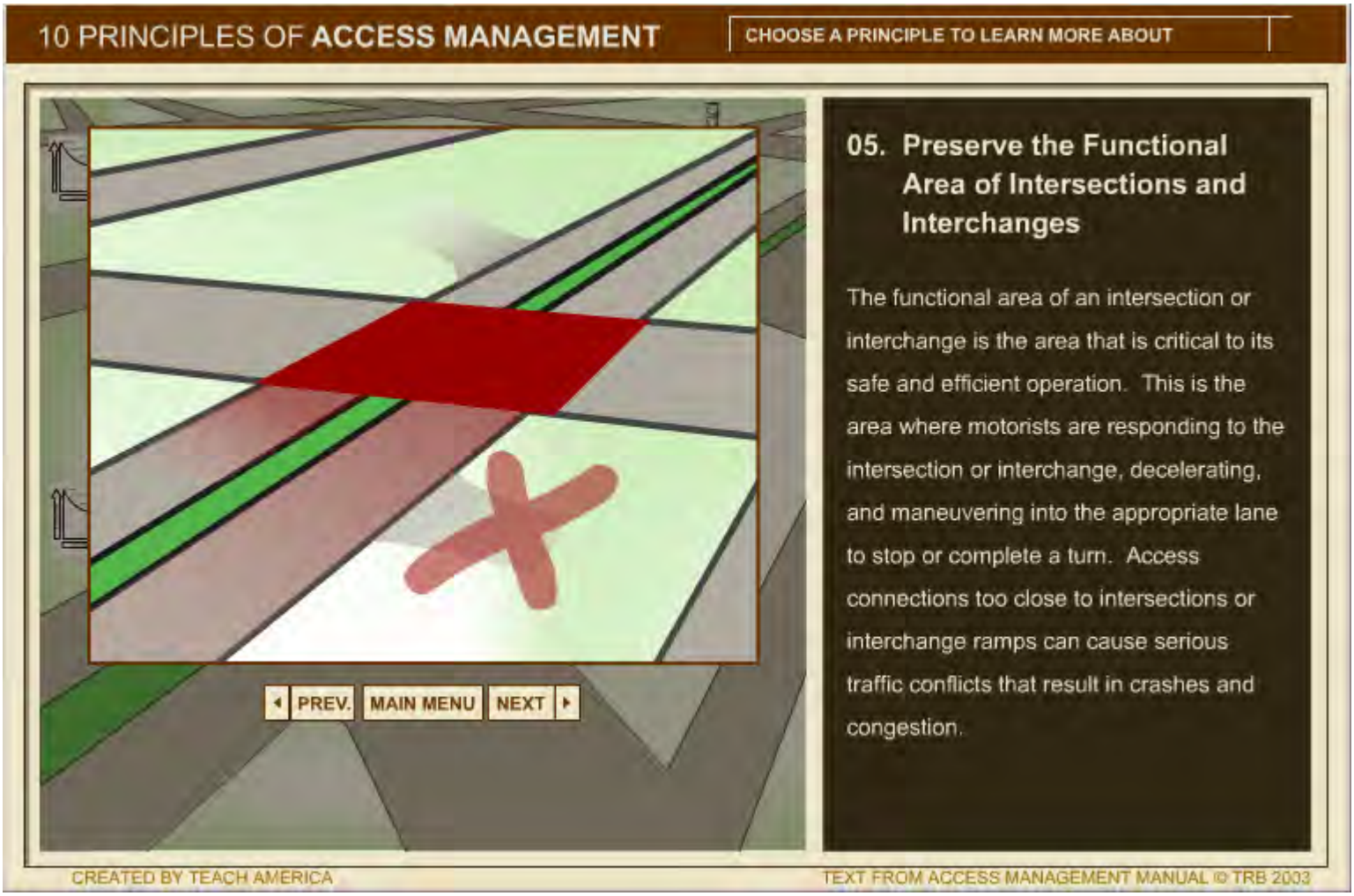
National Principles of Access Management

Preserver Intersections and Interchanges



[The full animation is available at http://www.accessmanagement.gov]

National Principles of Access Management

Limit the Number of Conflict Points

[The full animation is available at http://www.accessmanagement.gov]

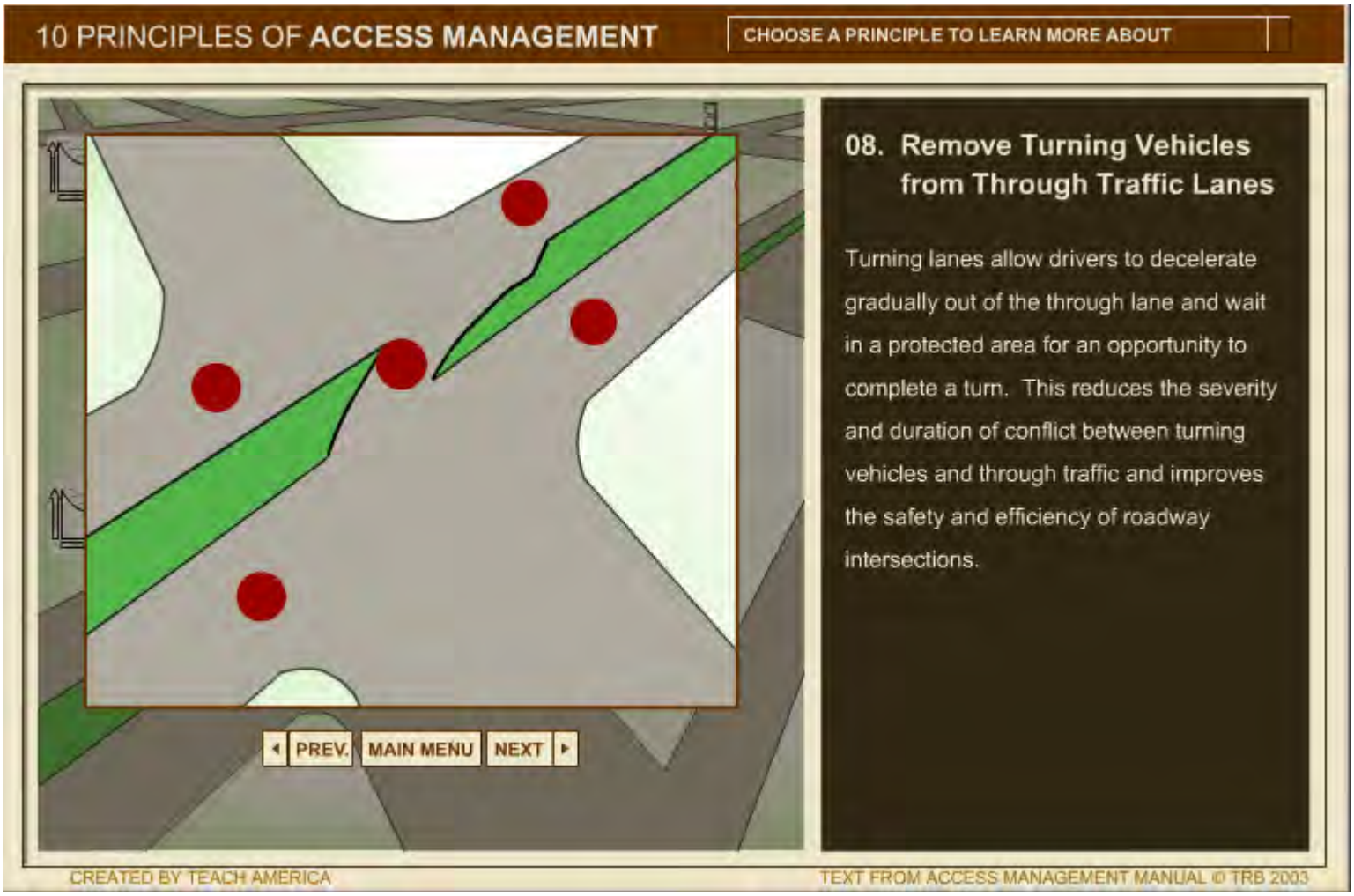
National Principles of Access Management

Separate Conflict Areas

[The full animation is available at http://www.accessmanagement.gov]

National Principles of Access Management

Remove Turning Vehicles from Through Traffic Lanes



[The full animation is available at http://www.accessmanagement.gov]

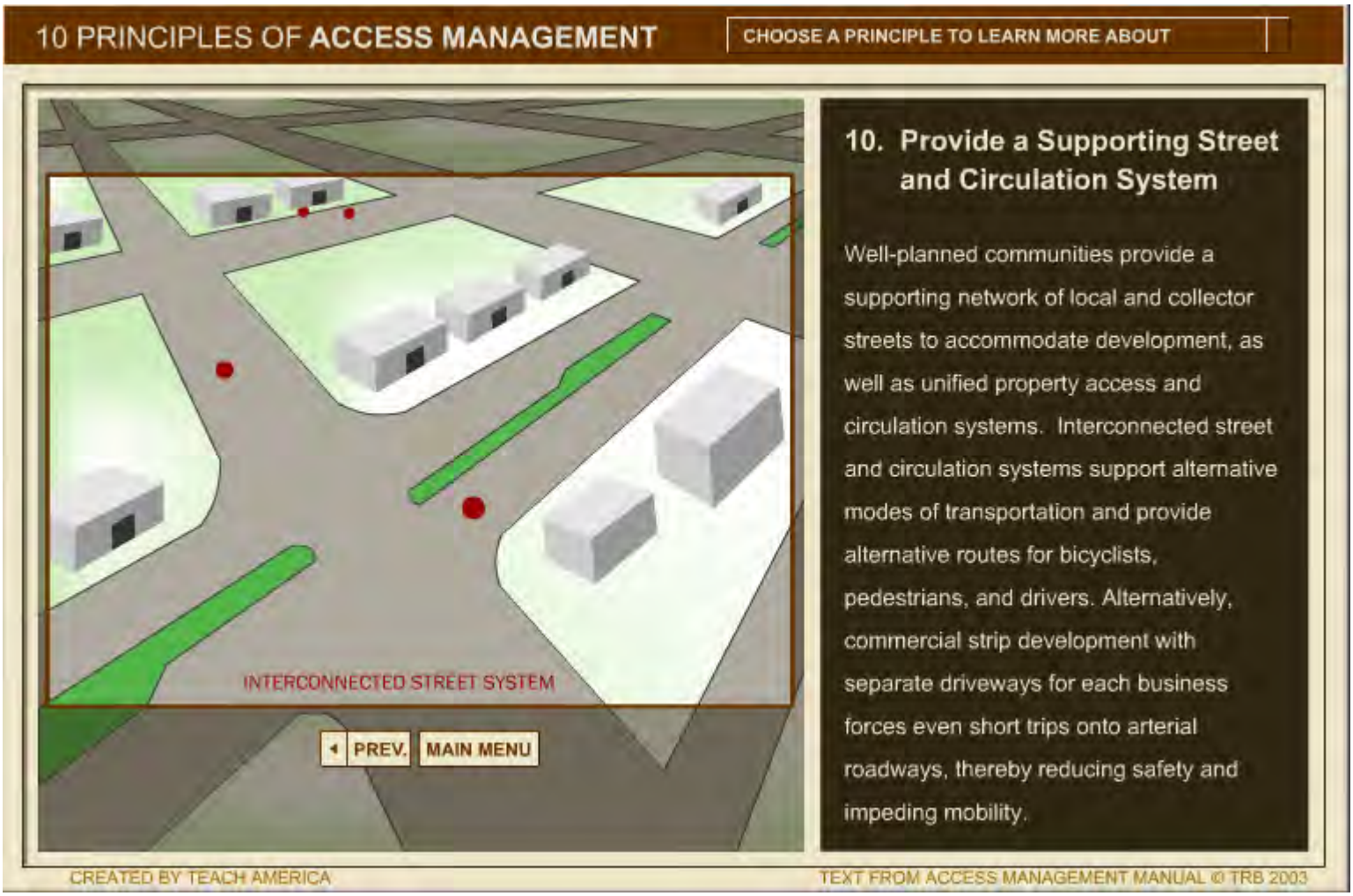
National Principles of Access Management

Use Nontraversable Medians

[The full animation is available at http://www.accessmanagement.gov]

National Principles of Access Management

Provide a Supporting Street and Circulation System



[The full animation is available at http://www.accessmanagement.gov]

Ten Ways to Manage Roadway Access in Your Community

Ten Ways to Manage Roadway Access in Your Community

Costly improvements are not always the solution to safety and congestion problems. Roads, like other resources, also need to be carefully managed. Corridor access management strategies extend the useful life of roads at little or no cost to taxpayers. Following are ten ways that you can make the most out of your transportation system.

1

Lay the foundation for access management in your local comprehensive plan.

To assure that your roadways are managed properly, your comprehensive plan needs to address certain key issues. *First*, include goals, objectives, and policies related to access management in the plan. Tailor policy statements to advance the access management principles in this brochure. For example, a policy could be adopted promoting interconnection of adjacent developments along major roadways.

Second, make sure that your local transportation plan classifies roadways according to function and desired level of access control. This hierarchy of roadways is reinforced through roadway design and access standards in your land development code. For example, arterials require a much higher level of access control and different design standards than collectors or local streets. Some roadways require special attention because of their importance, the need for additional right-of-way, or due to significant access problems. These areas may be designated for special treatment in the comprehensive plan.

Third, provide for a greater variety of street types with varying design standards. Options could include access lanes, alleys, variations in on-street parking, and so on. This reduces development costs, promotes compact development, increases opportunities to interconnect streets, and helps save your major thoroughfare system. Many communities have only a few residential street design options that apply whether a subdivision has 8 homes or 80. Lack of design flexibility impedes infill development and results in a monotonous street layout. It can also cause a proliferation of substandard and inadequately maintained private streets.

2

Restrict the number of driveways per lot.

Establish a basic requirement that driveways are limited to one per parcel, with special conditions for additional driveways. Lots with larger frontages, or those with needs for separate right and left-turn entrances, could be permitted more than one driveway, in accordance with driveway spacing standards. Limitations on new driveways may be established using a "corridor overlay" approach, which adds new requirements onto the underlying zoning (see Figure1). It is necessary to first identify and map the boundaries of all existing lots and parcels along the corridor. Then you could assign one driveway to each mapped parcel by right. This land may be further subdivided, but all new lots would need to obtain access from the existing access point.

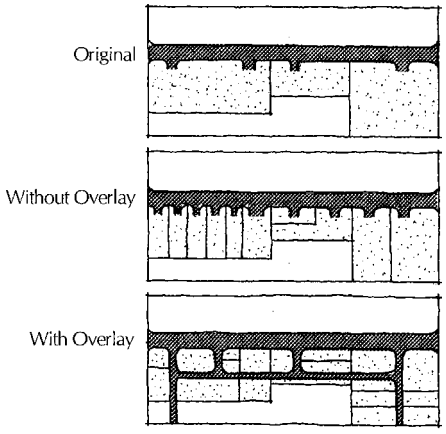


Figure 1. Corridor overlay

3

Locate driveways away from intersections.

Setting driveways and connections back from intersections reduces the number of conflicts and provides more time and space for vehicles to turn or merge safely across lanes. This spacing between intersections and driveways is known as corner clearance. Adequate corner clearance can also be assured by establishing a larger minimum lot size for corner lots. You could impose conditional use limitations where adequate corner clearance cannot be obtained. This helps assure that corner properties do not experience access problems as traffic volumes grow.

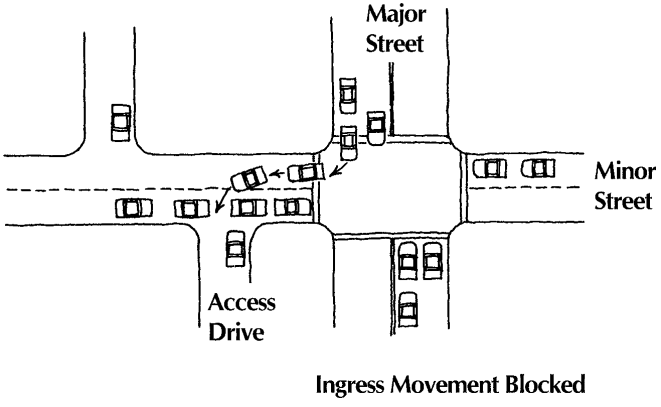


Figure 2. Inadequate corner clearance.

4

Connect parking lots and consolidate driveways.

Internal connections between neighboring properties allow vehicles to circulate between businesses without having to re-enter the major roadway (see Figures 3 and 4).Joint and cross access requirements in your land development code can help to assure connections between major developments, as well as between smaller businesses along a corridor.

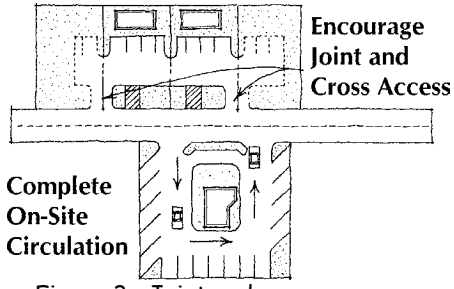


Figure 3. Joint and cross access.

Cross access also needs to be provided for pedestrians. Sidewalks are typically placed far away from buildings on the right-of-way of major roadways, or are not provided at all. Pedestrians prefer the shortest distance between two points and will walk if walkways are provided near buildings. Joint and cross access strategies help to relieve demand on major roadways for short trips, thereby helping preserve roadway capacity. They also help to improve customer convenience, emergency access, and access for delivery vehicles.

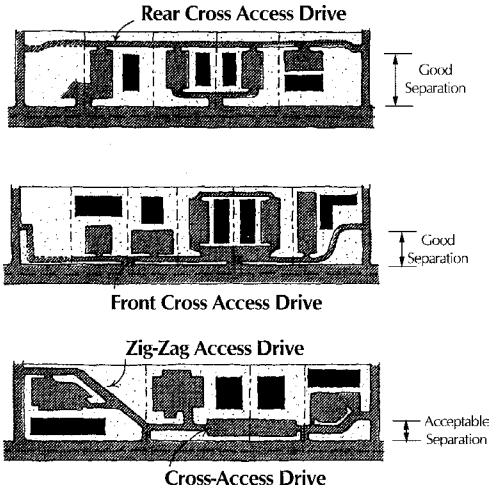


Figure 4. Cross access.

5

Provide residential access through neighborhood streets.

Residential driveways on major roadways result in dangerous conflicts between high-speed traffic and residents entering and exiting their driveway. As the number of driveways increase, the roadway is gradually transformed into a high speed version of a local residential street. Subdivisions should always be designed so that lots fronting on major roadways have internal access from a residential street or lane (also known as "reverse frontage"—see Figures 5 and 6). Minor land division activity can be managed by establishing a restriction on new access points and allowing land to be further subdivided, provided all new lots obtain access via the permitted access point. A variation of this approach is to allow lot splits on major roadways only where access is consolidated. Another step is to prohibit "flag lots" along major thoroughfares. Some property owners subdi-

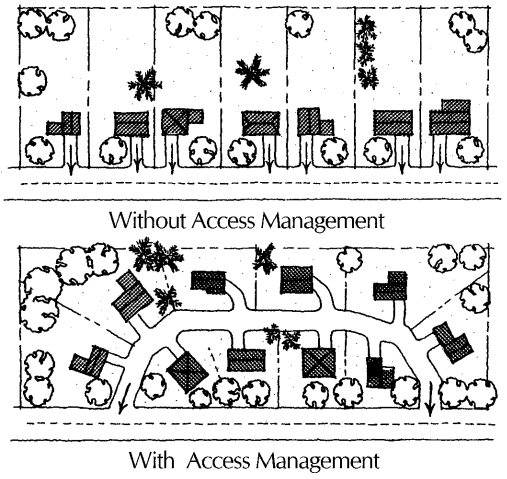


Figure 5. Shared access.

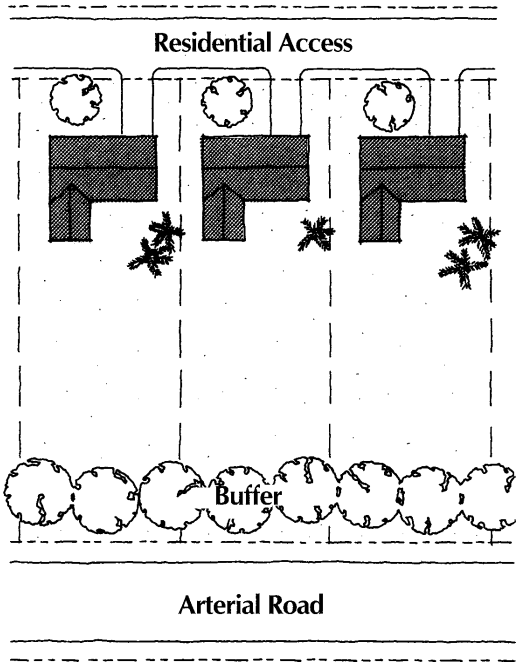


Figure 6. Reverse Frontage

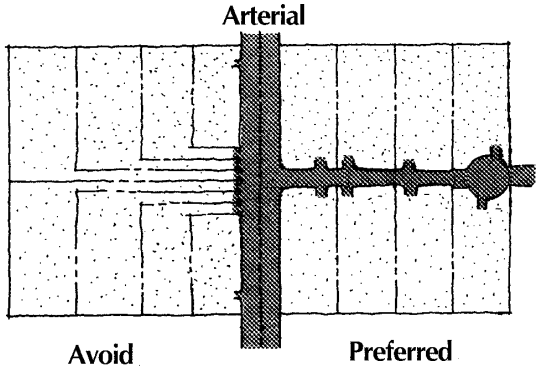


Figure 7. Avoid flag lots.

vide their land into lots shaped like flags to avoid the cost of platting and providing a road. Instead, the flag lots are stacked on top of each other, with the "flag poles" serving as driveways to major roads (see Figure 7). This results in closely spaced driveways that undermine the safety and efficiency of the highway. Eventually, residents may petition for construction of a local public road passing the cost of providing a subdivision road onto the community.

6

Increase minimum lot frontage on major roads.

Minimum lot frontages need to be larger for lots that front on major roadways, than those fronting on local roads. Narrow lots are a problem on major roads because they result in closely spaced driveways. Lots need to be deeper and wider along arterials to allow adequate flexibility in site design and to increase separation of access points (see Figure 8). Assuring an adequate lot size also protects the development potential and market value of corridor properties.

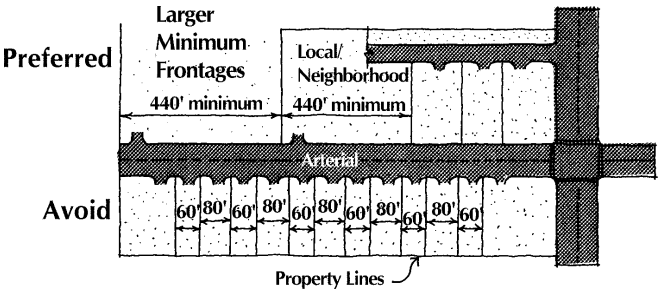


Figure 8. Lot frontage requirements.

7

Promote a connected street system.

As communities grow and land is subdivided for development, it is essential to assure continuation and extension of the existing local street system. Dead end streets, cul-de-sacs, and gated communities force more traffic onto collectors and arterials. Fragmented street systems also impede emergency access and increase the number and length of automobile trips. A connected road network advances the following growth management objectives:

- fewer vehicle miles traveled
- decreased congestion
- alternative routes for short, local trips
- improved accessibility of developed areas
- facilitation of walking, bicycling, and use of transit
- reduced demand on major thoroughfares
- more environmentally sensitive layout of streets and lots
- interconnected neighborhoods foster a sense of community
- safer school bus routes

Connectivity can be enhanced by a) allowing shorter blocks (600 ft.) and excluding cul-de-sacs from the definition of intersection; b) requiring stub streets to serve adjacent undeveloped properties; c) requiring street connections to nearby activity centers; d) requiring connections to

or continuation of existing or approved public streets; and e) requiring bicycle/pedestrian access-ways at the end of cul-de-sacs or between residential areas and parks, schools, shopping areas or other activity centers. It is also important to allow a greater variety of street types.

8

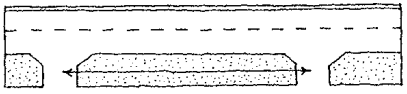
Encourage internal access to outparcels.

Shopping center developments often include separate lots or "outparcels" fronting on the major roadway. The outparcels are leased or sold to businesses looking for highly valued corridor locations. Access to these outparcels should be incorporated into the access and circulation system of the principal retail center. This reduces the need for separate driveways on the major road, while maintaining overall accessibility to the site. To accomplish this, establish that development sites under the same ownership or those consolidated for development will be treated as one site for the purposes of access management. Then require a unified traffic circulation and access plan for the overall development site.

9

Regulate the location, spacing, and design of driveways.

Driveway *spacing* standards establish the minimum distance between driveways along major thoroughfares (see Figure 9). These standards help to reduce the potential for collisions, as travelers enter or exit the roadway. They also encourage the sharing of access for smaller parcels, and can improve community character by reducing the number of driveways and providing more area for pedestrians and landscaping. The *location* of driveways affects the ability of drivers to safely enter and exit a site. If driveways do not provide adequate sight distance, exiting vehicles may be unable to see oncoming traffic. In turn, motorists on the roadway may not have adequate time to avoid a crash. Driveway *design* standards assure that driveways have an adequate design so vehicles can easily turn onto the site. Standards also need to address the depth of the driveway area. Where driveways are too shallow, vehicles are sometimes obstructed from entering the site causing others behind them to wait in through lanes. This blocks traffic and increases the potential for rear-end collisions.



Adopt minimum spacing standards for driveways

Reinforce with minimum lot frontage and joint access requirements

Figure 9. Driveway spacing standards.

10

Coordinate with the Department of Transportation.

The Florida Department of Transportation is responsible for access permits along state roadways. Local governments oversee land use, subdivision, and site design decisions that affect access needs. Therefore, State and local coordination is essential to effective access management. Lack of coordination can undermine the effectiveness of regulatory programs and cause unnecessary frustration for permit applicants.

Timely communication is key to an effective review procedure. Begin by establishing a coordinated process for review of access permits along state highways. The state per-

mitting official could have applicants send a copy of the complete permit application to the designated local reviewing official. Prior to any decision or recommendation, the state permitting official could then discuss the application with the local reviewing official.

Property owners also may be required to submit the necessary certificates of approval from other affected regulatory agencies, before a building permit is issued. In Florida, this should include a "notice of intent to permit" from the Florida Department of Transportation where access to the state highway system is requested.

An effective method of coordinating review and approval between developers and various government agencies is through a tiered process. The first stage is an informal meeting and "concept review" period, which allows officials to advise the developer about information needed to process a development application. This includes information on required state and local permits, and any special considerations for the development site.

The concept review provides the developer with early feedback on a proposal, before the preliminary plat or site plan has been drafted. Once the preliminary plan is drafted, it can be checked to determine if additional conditions are required for approval. The final plan that is formally submitted should then require only an administrative review.

Local governments could also request a response from the FDOT prior to approval of plats on the state highway system. Applicants could be required to send a copy of the subdivision application to the state access permitting official. This should occur early in the plat review process, preferably during conceptual review. Early monitoring of platting activity would allow the Department of Transportation an opportunity to identify problems and work on acceptable alternatives.

Intergovernmental agreements or resolutions can facilitate coordination between the state and local governments on access management. These tools can be used to clarify the purpose and intent of managing access along major thoroughfares, roadways that will receive special attention, and state and local responsibilities for advancing access management objectives.

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Training Opportunities

"Access Management: Site Planning," FDOT 1997 (A Training Unit), available through Gary Sokolow.

"Land Development Regulations that Support Access Management," FDOT 1997 (A Training Unit), available through Gary Sokolow.

Visit our Web Page at:

http://www.cutr.eng.usf.edu

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12 Parsonson, P., et al., *Effect on Safety of Replacing an Arterial Two-Way Left-Turn Lane with a Raised Median*, Proceedings of the First National Conference on Access Management, Federal Highway Administration, 1993.

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SAFE ACCESS IS GOOD FOR BUSINESS

U.S. Department of Transportation
Federal Highway Administration

You may be reading this primer because your state transportation agency or local government has told you about plans that will affect access to your business. They may be planning to install a raised median on your roadway, to close a median opening, or to reconfigure your driveway. Perhaps your request for a driveway is under review or the regulating agency has imposed conditions on its approval. Or, maybe the state or local agency is planning a new access policy and you have questions or concerns about the economic effects of these changes.

Whatever the reason, it is important for you to understand the basis for these changes and how they might affect your business. This primer will address questions you may have about access management and its effect on business activity and the local economy. It focuses on economic concerns that may arise in response to proposed access changes or policies, including potential impacts on business activity, freight and deliveries, parking for customers, and property or resale value of affected property.

Why is my access being changed or reviewed?

The access changes being proposed for your business or road are part of a growing effort by government agencies to improve how major transportation corridors are managed. These efforts, known as access management, involve the careful planning of the location and spacing of driveways, street connections, median openings and traffic signals. Access management can also involve using medians to channel left-turns to safe locations, and providing dedicated turn lanes at intersections and access points to remove turning vehicles from through lanes. The combined purpose of these strategies is to reduce crashes and traffic delay.

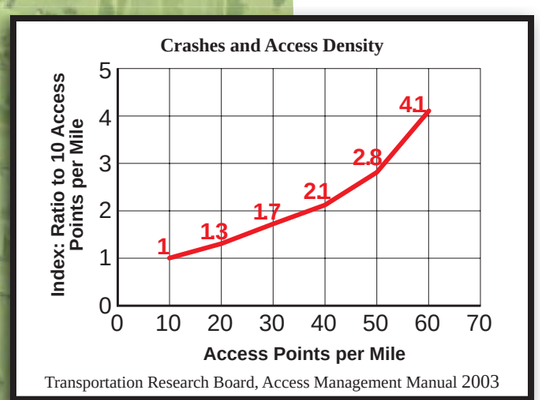
To understand access management, it is important to know that roads have different primary functions; either to provide access or move traffic.

- The main function of ***minor roads***, like neighborhood collectors and local streets, is to provide access. Minor roads must operate at slower speeds so people can enter and exit homes and businesses safely and conveniently.
- The main function of ***major roads***, like interstate freeways and regional highways, is to move traffic over long distances at higher speeds. Access to these roads must be carefully managed so requests for new access to development do not contribute to unsafe or congested conditions.

How exactly does this improve the situation on my road?

One reason managing access on major roads is so important is that driver safety is reduced when access is not properly located and designed. Imagine, for example, a driveway on an interstate freeway – it would certainly cause serious safety concerns. These same safety problems occur with improperly designed access to major arterial roads.

> *"In the four years I have lived here we at times have seen a lot of rear end collisions here, and we haven't seen one now for a long time."*
>
> **— E. Stanley Tripp of Tripp's Auto Sales in Spencer, Iowa, commenting on a median project in his area.**



Transportation Research Board, Access Management Manual 2003

Managing access on your road can result in better traffic flow, fewer crashes, and a better shopping experience for you and your neighboring businesses. Consider the effects of adding more access points to a highway. A national study in the late 1990s looked at nearly 40,000 crashes and data from previous studies to determine the crash rate associated with adding access points to major roads. It found that an increase from 10 to 20 access points per mile on major arterial roads increases the crash rate by about 30% *(1)*. The crash rate continues to rise as more access is permitted. This is why **studies consistently show that well-managed arterials are often 40 to 50 percent safer than poorly managed routes** *(2)*.

How can I have a say in the access management project on my road?

Get involved! All government agencies are required to involve the public in transportation policy and project decisions. Most state transportation agencies offer open house meetings during transportation project planning and design, and both state and local government agencies conduct public meetings and hearings when making important policy or regulatory changes that involve access management. Prospective business owners can also review area master plans to research potential changes.

It is important for you as a stakeholder in an access management project to attend public meetings and hearings and to voice your ideas and concerns.

These meetings are opportunities for you to hear more about an access management project or plan and to make the planners and engineers aware of how it impacts your business. This might involve issues related to internal traffic circulation and parking, deliveries, plans for expansion, etc. Knowing this information early in project planning or design allows them to make better project decisions and can result in changes that reduce or avoid adverse impacts on your business.

For example, many businesses depend on trucks for deliveries and other functions. Larger trucks are not typically able to make certain movements (such as U-turns). It is important to work with agency staff to develop a plan that will accommodate truck access to your business in a manner as convenient as possible. Sometimes this will require that trucks follow a slightly different route to arrive at the property. Project planners can work with you to assure that trucks will be able to access your business. This is just one of many ways your input is important.

Where can I go to learn more about access management?

Hopefully this primer has answered some of the questions that you, as a business or property owner, may have. Your state or local transportation agency or your state's Federal Highway Division office (on larger projects) are other excellent resources to point you to the right project manager, or to answer your general questions concerning access changes. These transportation agencies need and value your input as they strive to provide a safe and efficient highway system.

For the latest information on access management or to order the latest Access Management Library CD/DVD collection, go to **www.accessmanagement.gov**. Other important sources for information on the economic effects of access management include the TRB Access Management Manual, and NCHRP Report 420: Impacts of Access Management Techniques, which are both available from the Transportation Research Board at **www.trb.org**.

What can be done to keep my business going during construction?

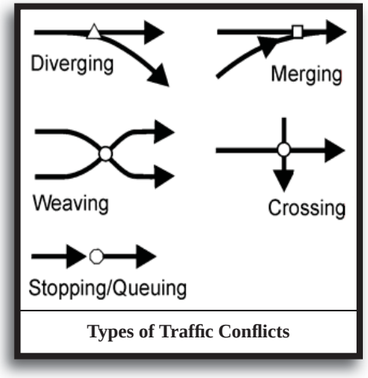
There's no doubt about it, road construction can disrupt customers and drivers, but there are ways adverse impacts can be minimized. **Two key issues during construction are maintaining open access to businesses for customers and deliveries, and having sufficient sign visibility so your customers know you are open, and know how to enter and exit your site during this period.** When your road is scheduled for reconstruction, your transportation agency will initially notify you about what to expect in terms of traffic, duration of construction, any foreseeable disruptions, and so on. It is important for you to respond to them about your special needs and concerns. Below are some of the things that you can ask of the agency:

- Provide clear signs from the roadway to business entrances;
- Provide temporary and/or secondary business access points, where feasible;
- Schedule construction for after business hours or to occur during times of low usage for seasonally-oriented businesses;
- Provide alternative parking, if possible and avoid taking or blocking parking spaces;
- Stagger construction along a corridor so impacts are localized and staged;
- Expedite construction through incentive/disincentive programs;
- Avoid blocking business entrances with construction equipment or construction barriers;
- Establish a single point of contact in the agency about the construction project to communicate with property and business owners and help address issues that may arise;
- Provide regular project progress reports to business and property owners.

Business owners certainly may see drops in gross revenues during construction. But these are not unlike drops you may routinely experience during expansions, remodeling, seasonal variations, or other self-initiated management. Experience has shown that "construction" drops are temporary too, and that retail sales typically return to pre-construction levels or greater. Research findings from corridors in Texas indicate that businesses did not change employment levels during construction periods. This finding indicates that retailers understand that construction projects are a temporary and perhaps even an inevitable disruption to business, and that loyal patrons will return to stable businesses. The same research found that gross revenues typically either returned to pre-construction levels or were higher after construction was complete *(7)*.

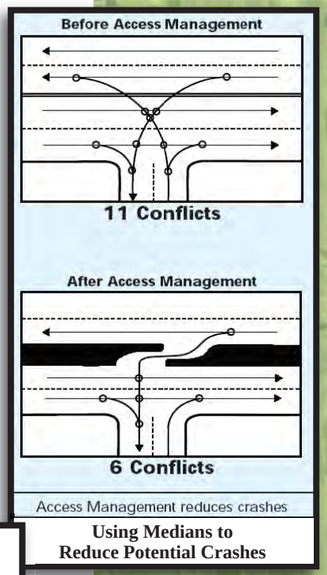
Example of Crash Involving Left-Turn Movement from Driveway

How does access management improve safety?



Types of Traffic Conflicts

Each access point creates potential conflicts between through traffic and traffic using that access. Each conflict is a potential crash. **Access management improves safety by separating access points so that turning and crossing movements occur at fewer locations.** This allows drivers passing through an area to predict where other drivers will turn and cross, and also provides space to add turn lanes.



Using Medians to Reduce Potential Crashes

The figure to the right shows how basic changes in access design, such as incorporating a median or changing a full median opening to a directional opening, can reduce traffic conflicts and the potential for crashes.

If crashes and congestion become frequent on your roadway, people will seek out other routes. Bear in mind that a single crash can tie up traffic and potential customers for hours.

What about congestion and the effect it has on my market area?

Access management not only improves roadway safety, it also helps reduce the growing problem of traffic congestion. Frequent access and closely spaced signals increase congestion on major roads. **As congestion increases, so does delay, which is bad for the economy and frustrating to your customers.** Well-managed arterials can operate at speeds well above poorly managed roadways – up to 15 to 20 miles per hour faster. **This means more traffic past your door and better exposure for your business. It also means a more convenient shopping experience for your customers.**

How will a change in access affect the success of my business?

To address this question, it's important to first determine the type of business that you own – drive-by or destination.

- **"Destination businesses"** are businesses that customers plan to visit in advance of the trip. Examples include electronics stores, doctor or dentist offices (in fact most offices), major retailers, insurance agencies, sit down restaurants, etc.

- **"Drive-by businesses"** are those that customers frequent more on impulse or while driving by, such as convenience stores, gas stations, or fast food restaurants.

If you own a drive-by business, your clients will expect to get in and out easily from the highway. For you, the critical issues are *visibility*, *signage*, and *convenient access*. If your site is relatively small, a driveway connecting to the highway may not be your best option. A driveway on a highway service road or a private circulation lane serving several properties can increase the convenience of your access and the volume of customers you can accommodate. Convenient access can be provided by periodic connections between the service road and the highway, or through the shared private access points. Short driveways or open frontages not only cause safety hazards for pedestrians and traffic, but have less capacity than local roads or long driveways.

Access management has no impact on the demand for goods and services.

"Our business has increased about 20% in customer count."

— C. Randy Rosenburger of City Looks in Ankeny Iowa.

If you are the owner of a destination business, your customers are planning their trips in advance. A driveway on a congested highway or a highway that is perceived as unsafe may actually intimidate customers from making the trip. Most small destination businesses or specialty stores benefit more from access to a lower speed minor road, such as a neighborhood collector road. The greater exposure that a major road provides is an advantage for larger destination businesses, but it's a good idea to have access from more than one roadway. Allowing customers to enter and exit from different directions will increase safety and convenience.

So what's the bottom line on access management?

Efforts by government agencies to manage access in site development and road projects can help businesses, even those operating on older highway corridors, in a variety of ways. Here are some specific benefits to you and your customers:

- **Fewer roadway delays and better traffic flow will result, which will preserve and possibly even enhance the market reach of businesses in your corridor;**
- Safer approaches to businesses result from installation of medians, which can also be landscaped to improve the image of the area;
- Properly designed entrances shared by multiple businesses allow more site area for parking, more customer options to access your site, and improved landscaping or other site amenities;
- Service roads along the highway allow customers to enter and exit businesses conveniently and safely, away from faster moving through-traffic;
- Internal connections between businesses allow customers to circulate easily, without reentering a busy road; and/or
- Driveways and service road entrances farther away from signalized intersections allow easy access for customers, even during times of peak congestion.

"It has been a very positive thing all the way around, from the economic, and the community sides. We have improved our tax base, we have improved our traffic problem, and plus we have improved our business community."

— Chuck Fisher, Supt. Public Works Ankeny, Iowa

In brief, minimizing the number of curb cuts, consolidating driveways, constructing landscaped medians, and coordinating internal site circulation and parking among several businesses results in a visually pleasing and more functional corridor. That protects your investment in your business, the public investment in the roadway, and can even help attract new investment into the area.

"There are a lot of beautification projects going on, tree plantings and what have you. I think the landscaping in the medians has very much added to the very nice decorum of Ankeny. It will make a nice impression for those visiting Ankeny, or living here."

— Andy Kasper, Iowa Realty, Ankeny, Iowa

What are the other issues with frontage or service roads?

- **Service roads that run behind highway properties are often less disruptive to existing businesses than frontage roads, less costly for an agency, and more functional than a frontage road.**
- Rear service roads can provide access to businesses on each side and can operate safely from both directions. Frontage roads provide access only to businesses fronting on the highway and are much safer when designed for one-way traffic.
- Additional right-of-way will be needed for the frontage or service road and for connecting a service road back to the highway or side street. If your site will be impacted, it is important to work with the agency on how to reduce adverse effects. For example, if your site becomes nonconforming under local zoning regulations because of a smaller setback or other change, ask the local agency if they will waive that status, given that it was caused by a government right-of-way taking.

What are other commonly used access management techniques?

Regulate minimum spacing of median openings and access connections (driveways and street connections).	Limit the number of access points per property, or consolidating access points and encouraging shared driveways.	Establish standards for driveway width, driveway throat length and internal drive aisles to move traffic smoothly off of the adjacent street.
Move access points away from signalized intersections and freeway ramps.	Incorporate right- and left-turn lanes into roadways.	Close or replace a full median opening with a directional opening.
Provide a service road or parallel collector roads and side streets for site access along an arterial roadway.	Promote interconnection of parking lots and unified on-site circulation systems.	Install a median on an undivided roadway or replace a continuous two-way left-turn lane with a median.

How important is access to the success of my business?

Location and access are factors, but not the most important factors that determine whether businesses succeed or fail. The main reason that businesses fail is lack of management expertise *(3)*. The main reasons that businesses succeed include *(4)*:

- the experience of management,
- how well customers are served,
- the quality of the product or service provided,
- adequate financing and investment,
- well-trained employees,
- the level and nature of competition, and
- keeping costs competitive.

Given that access is not the primary reason that businesses survive or fail, it follows that a change in access will not be the primary cause of whether a business will survive or fail. In fact, access is one of the lesser factors that customers will consider when weighed against price, service, product, and store amenities.

This is not to say that good access is not important to your business. **Whether your business is large or small, it is important that you can handle customer traffic demand.** If you operate or develop major retail centers, factories, or campuses, proper location and design of access is essential to customers and employees. For shopping centers, the Urban Land Institute's Shopping Center Development Handbook states "poorly designed entrances and exits not only present a traffic hazard, but also cause congestion that can create a negative image of the center *(5)*."This is also true for small businesses, especially those on the intersection of busy roads. If your business is difficult or unsafe to enter or exit, then customers may be dissuaded from visiting.

Just think about the roads in your community where access has been carefully planned and compare them to those having lots of driveways, open frontages, and no median. Which roads do you prefer to travel on and which corridors have the most vibrant businesses?

Small corner properties are more difficult to access.

This queue is blocking street traffic and additional customers

Is this a sign of a store doing great business, or one that is telling customers to try the next guy down the street?

What has been the impact to businesses where this type of thing has been done?

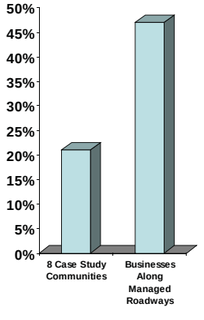
Studies of the business impacts of access management projects in Florida, Iowa, Minnesota, Kansas and Texas have consistently found that most businesses continue to do well when the project is completed. These results are particularly true for destination businesses. However, most drive-by oriented businesses are not unduly affected either. Drive-by businesses have been adversely affected by reconstruction projects that reduce their visibility from the major road or cause them to have highly circuitous or inconvenient access. However, these are not typical impacts of access management projects and where they do occur, it is not uncommon for transportation agencies to compensate business owners for losses.

Business activity: Access management projects alone do not appear to increase or decrease business failure rates *(6)*. This makes sense considering that many factors other than highway access can affect business success. **"Before and after" studies of businesses in Florida, Iowa, Minnesota, and Texas along highways where access has been managed found that the vast majority of businesses do as well or better after the access management projects are completed.** The turnover rate (the proportion of businesses that close or move out each year) of businesses in Iowa and Minnesota was studied along newly access-managed corridors and was similar to or lower than that of the surrounding area. For example:

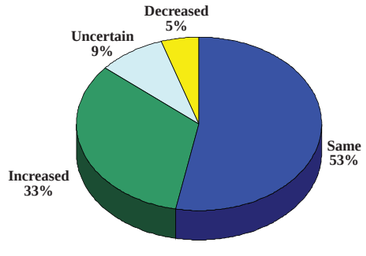
Businesses affected by access management projects in Iowa tended to do at least as well in terms of growth in retail sales, but usually better than those in surrounding communities, after the projects were completed. Most of these Iowa business proprietors said that sales were similar or greater following the completion of the projects. Only five percent reported a sales decrease *(6)*.

Impact of Access Management on Retail Sales Growth

- In the 1990s, retail businesses along eight recently access managed roadways in Iowa were compared to their surrounding communities.
- The businesses along the managed corridors experienced much higher retail sales growth during the decade than those businesses in other locations in these eight communities.



Business Proprietors' Reported Sales Comparisons



FRONTAGE or SERVICE ROADS

A *frontage road* is a type of service road that parallels a major road or freeway and is located between the road and building sites abutting the road. *Service roads* can also run behind businesses.

The purpose of these roads is to provide lower-speed access to commercial sites along a major roadway and to separate business traffic from higher-speed through traffic. Connections of frontage or service roads to side streets or onto the highway must be well away from signalized intersections, so entering and exiting traffic doesn't conflict with traffic queuing at signals.

Rear service roads providing access to highway commercial properties.

A frontage road.

How will I get access while I'm waiting for a frontage or service road to be finished?

Some sites may need to be given temporary access to the major roadway until the service road system is complete. This is typically needed when a service road is being constructed in segments through the development process, rather than built by a transportation agency as part of a road construction project. Most agencies will require you to remove your temporary driveway and build a driveway to the frontage or service road at a later time, so it's important to design your site access and circulation to accommodate that change.

How will people know how to get to my business from the highway?

Frontage roads maintain good visibility for businesses along a major road and typically it is apparent how to enter and exit the road to get to a business. Points of entry can be signed to identify businesses that can be accessed from that entrance, if it is not already apparent. **It's a good idea to provide signs where a service road or frontage road connects at a side street, so customers know they can obtain access** to businesses that may not be visible from the side street.

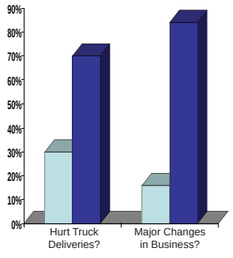
Why not just signalize all median openings and high volume driveways?

The decision on whether or not to signalize a median opening or access point depends on many factors, including the volume of traffic using the access, the proximity of other traffic signals, and the potential impact on public safety and traffic congestion. Most signal warrants are related to traffic volumes, but some consider school crossings, crash history, pedestrian crossings, "factory" peaks, and other situations. Unwarranted signals cause undue delays as motorists wait at a red light while little or no cross traffic exists. Worse, unwarranted signals may eventually be disobeyed or ignored by frustrated motorists who are only one reckless incident away from causing an accident or emerging as a casualty themselves. For these reasons, median openings and driveways should not be signalized where they do not meet the requirements of a traffic signal study.

What about impacts on truck deliveries?

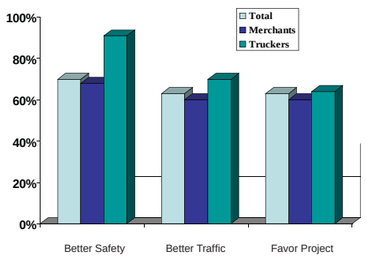
The limited number of before-and-after studies have found that truck deliveries may be inconvenienced, at worst, but may in fact benefit from improved opportunities resulting from a change in access. And while the actual studies may be few, the anecdotal comments are many and favorable.

Merchant opinions of median changes on Oakland Park Blvd., Florida



96 Merchants Responded

Merchant and trucker opinions about a median project in Ft. Lauderdale, Florida



What are the other issues with medians and median opening closures?

- Alternative access through side streets, service roads, or internal connections with neighboring developments helps increase accessibility on busy or median separated roads – especially if the result allows several properties access to a signal.
- Minor roadway improvements, such as additional pavement on the shoulder, may be needed to accommodate U-turning traffic.
- Some trucks and large vehicles may need to take alternate routes as U-turns can be difficult to negotiate.
- Medians can be landscaped to enhance the image of an area and help attract investment and customers.

Business owners report that the actual impacts to their businesses were much less than they anticipated. Most adverse impacts were due to construction and not to access changes.

"If anything, our business has increased, which very much surprised me."

— D. Stanley Tripp of Tripp's Auto Sales in Spencer, Iowa

Property values: Most property owners surveyed following an access management project do not report any adverse effect of the project on property values. Often, such projects can have a positive effect by cleaning up the patchwork of driveways and curb cuts. For example:

A study of property values on **Texas** corridors with access management projects found that land values stayed the same or increased, with very few exceptions *(7)*.	More than 70% of the businesses impacted by a project in **Florida** involving several median opening closures reported no change in property value, while 13% reported some increase in value *(8)*.
A 2005 study of commercial property values along a major access management project in **Minnesota** found that property values depend more on the strength of the local economy and the general location of the property in the metropolitan area; changes in access seemed to have little or no effect on the value of parcels *(9)*.	A study of **Kansas** properties impacted by access changes found that the majority were suitable for the same types of commercial uses after the access management project was completed. This was true even for businesses that had direct access before the project and access only via frontage roads after project completion *(10)*.

Customers and deliveries: The majority of customers and truck drivers surveyed in before-and-after studies have reacted positively to access management projects as improving both safety and traffic flow. Business customers surveyed about access management projects in Iowa, Texas and Florida overwhelmingly supported the projects because their drive became quicker, easier and safer *(6)*.

What are some common types of access management projects and what are the impacts?

There are many access management techniques, each with a specific purpose and different type of impact. One common type of access change is the building of a **median** on a road or closing existing median openings. Another common type of project is providing a **frontage road** or a rear service road along a highway for access to businesses. Below is an overview of these strategies, the types of issues or impacts associated with these projects, and how you can work with the agency to adjust to these changes.

MEDIANS and MEDIAN OPENINGS

A *median* is a grass or raised divider in the center of a road that separates opposing traffic and discourages or prevents vehicles from crossing the divider.

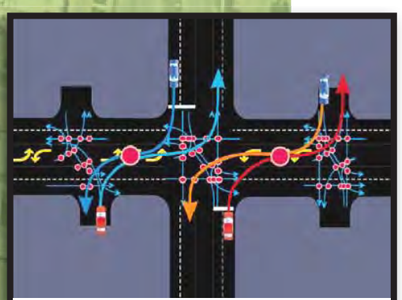
Openings in the median provide for different turning or crossing maneuvers, depending on how they are designed.

- A ***directional median opening*** only allows certain movements, usually a left-turn in or U-turn.
- A ***full median opening*** allows all turning and crossing movements and is often signalized.

Where too many full median openings exist, agencies may reconstruct the median and close the excess median openings.

Turn lanes at median openings provide a safe haven for turning vehicles.

Why use a median and not a two-way left turn lane?



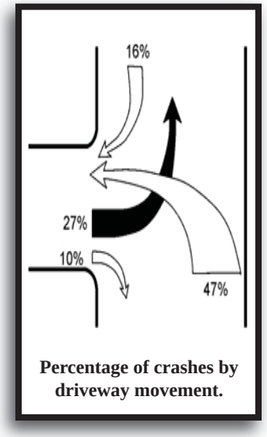
Conflicts and potential crashes associated with continuous two-way left turn lanes

Medians can have a profound effect on driver safety compared to two-way left-turn lanes. Adding a median to a road that previously had a continuous two-way left turn lane can reduce the crash rate about 37% and the injury rate about 48% *(11)*. **For example, when a continuous two-way left turn lane was replaced with a median on Atlanta's Memorial Drive, the crash rate was cut in half *(12)*.**

One reason a two-way left turn lane is less safe than a median is that a driver who is turning left must be able to ensure that the traffic is clear from two directions in multiple lanes. When this is not quite possible, drivers will sometimes use a two-way left-turn lane in the middle of the road while attempting to merge into traffic. Such maneuvers can lead to serious crashes and become more frequent as traffic volumes increase.

Won't I lose customers if they can't turn left into my business anymore?

The number of your customers making left turns into your business is likely already very low during peak travel periods or if you are on a congested roadway. This is because left turns into any business become increasingly difficult as traffic volumes in the opposing lanes increase.



Percentage of crashes by driveway movement.

Perhaps today your customers wait with apprehension to turn left as cars queue behind them, or must shoot across a busy road to complete a left turn out. A turn lane at a median opening or signalized intersection will allow them to wait safely to complete a U-turn when traffic clears, and that is truly a safer option on a busy road. **In fact, the left-turn into and out of a driveway is less safe than a U-turn and comprises the majority of driveway crashes.** Studies have shown that making a U-turn at a median opening to get to the opposite side of a busy highway is about 25% safer than a direct left turn from a side street or other access point *(13)*.

Surveys show that a majority of drivers have no problem making U-turns at median openings to get to businesses on the opposite side of the road. Where direct left-turns are prohibited, studies show that motorists will change their driving or shopping patterns to continue patronizing specific establishments. In fact, most drivers are reporting that access management improvements made the roads safer and that they approve of the changes, despite minor inconveniences associated with U-turns.

Some owners of drive-by businesses have reported a loss of customers following a median project or other change that has eliminated the left-turn-in opportunity (and less often left-turn-out), although the majority do not. For example, a before-and-after study of a median reconstruction project in Florida involving numerous median-opening closures found that **the majority of surveyed merchants, 68% of the 96 respondents, reported little or no economic impact to their businesses, although 27% reported some type of loss *(14)*.** Generally, businesses that feel they were adversely impacted also have competition nearby or may have experienced reduced visibility of signage.

> "Because of the design of the roads, the timing of the traffic signals, and the way the traffic is broken up, it has become very convenient for people to pull into a safe haven, or storage lane within the raised median, take their time and make a safe and convenient u-turn to access properties that were concerned about that problem."
>
> **— Kurt Easton, Executive Director of Merritt Island Redevelopment Agency, Florida**

ACCESS SPACING

Signal Spacing

Signals Per Mile	Increase in Travel Time (%)
2	-
3	9
4	16
5	23
6	29
7	34
8	39

Increasing the distance between traffic signals improves the flow of traffic on major arterials, reduces congestion, and improves air quality for heavily traveled corridors. The appropriate spacing between signals for a particular corridor depends greatly upon the speed and flow of traffic, but anything greater than two signals per mile has a significant impact on congestion and safety.

A major synthesis of research on access management found that each additional signal over two per mile (i.e., a one-half mile signal spacing) increased travel time by over six percent. [4] A study of an intersection in Cincinnati where a signal was added found a 20 percent increase in peak travel times. [11]

A demonstration project in Colorado revealed that half mile signal spacing and raised medians on a five-mile roadway segment reduced total hours of vehicle travel by 42 percent and total hours of delay by 59 percent, compared to quarter mile signal spacing. [1]

Signals Per Mile	Crashes Per Million VMT
Under 2	3.53
2 to 4	6.89
4 to 6	7.49
6 +	9.11

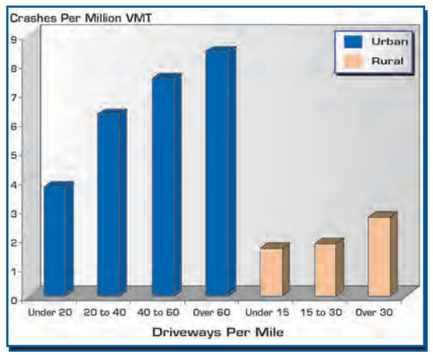
Improved speeds and travel times translate directly into environmental benefits. An ongoing study in Texas found that a ten mile four-lane arterial with one-half mile signal spacing reduced fuel consumption by 240,000 gallons from increased speed and 335,000 gallons from reduced delay, compared to quarter mile signal spacing. [14]

Increasing the distance between signals also reduces the incidence of crashes. A review of crash data from seven states demonstrated that the crash rate increased substantially with additional signals per mile. [4] This is partly related to access spacing, which is presented next.

Driveway Spacing

Appropriate driveway spacing presents another major access issue. Large numbers of driveways increase the potential conflicts on the road. Fewer driveways spaced further apart allow for more orderly merging of traffic and present fewer challenges to drivers.

The congestion impacts of reduced driveways are fairly clear. It is impossible for a major arterial or highway to maintain free flow speeds with numerous access points that add slow moving vehicles. A research synthesis found that roadway speeds were reduced an average of 2.5 miles per hour for every 10 access points per mile, up to a maximum of a 10 miles per hour reduction (at 40 access points per mile). [4] With higher numbers of access points, congestion will increase significantly.



An overabundance of driveways also increases the rate of car crashes. An examination of crash data in seven states indicated found a strong linear relationship between the number of crashes and the number of driveways. Rural areas had a similar, but less strong relationship. [4,7]

RELATED TECHNIQUES

Access management includes more techniques than can be discussed in a single brochure. Some of these techniques are newer and have been researched somewhat less. Frontage roads have been the subject of some debate in the literature, but there is no clear indication of their benefits. Other techniques, such as the relationship between highway interchange spacing and local traffic, are new topics that require more research.

Many cities and states develop access management programs to deal with existing issues of congestion and safety. An active access management program, however, would need to include changes to local land use policies that encourage the rational development of major roads. In newly developing areas, land use and zoning controls that limit the number of access points and leave space for median improvements can save money and effort as these areas develop.

TURNING LANES

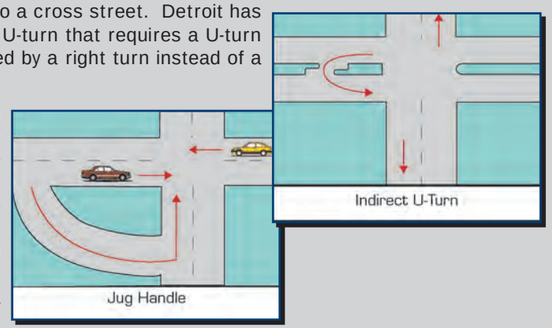
Left Turns

Exclusive turning lanes for vehicles remove stopped vehicles from through traffic. Left-turn lanes at intersections substantially reduce rear-end crashes. A major synthesis of research on left-turn lanes demonstrated that exclusive turn lanes reduce crashes between 18 to 77 percent (50 percent average) and reduce rear-end collisions between 60 and 88 percent. [4]

Left-turn lanes also substantially increase the capacity of many roadways. A shared left-turn and through lane has about 40 to 60 percent the capacity of a standard through lane. [4]. A synthesis of research on this topic found a 25 percent increase in capacity, on average, for roadways that added a left-turn lane. [13]

Indirect Turns

Some of the biggest issues with managing access come at intersections where vehicles must cross traffic. Some states and cities have adopted indirect turns to reduce these conflicts. In New Jersey, the jug-handle left turn requires a right turn onto a feeder street, followed by a left onto a cross street. Detroit has extensively used an indirect U-turn that requires a U-turn past an intersection, followed by a right turn instead of a regular left turn.



Like dedicated left-turn lanes, indirect turns reduce crashes, improve congestion, and add capacity. Crashes decline by 20 percent on average, and 35 percent if the indirect turn intersection is signalized. Capacity typically shows a 15 to 20 percent gain. [4]

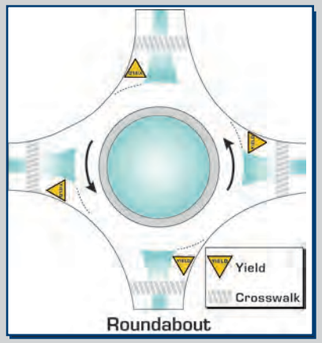
Right Turns

Right-Turning Vehicles Per Hour	Through Vehicles Impacted (%)
Under 30	2.4
31 to 61	7.5
61 to 90	12.2
90 and up	21.8

Right-turn lanes typically have a less substantial impact on crashes and roadway capacity than other types of turn strategies, because there are fewer limitations on right turns. Though there are fewer studies of these impacts, there is a clear relationship between the number of vehicles attempting a right turn in a through traffic lane and its delay to through traffic. This relationship is exponential – each additional car that must wait for a right turn will increase the delay more than the previous car. At intersections with substantial right-turn movements, a dedicated right-turn lane segregates these cars from through traffic and increases the capacity of the road.

Roundabouts

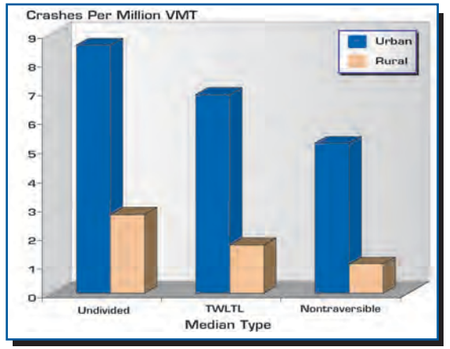
Roundabouts represent a potential solution for intersections with many conflict points. Though not appropriate for all situations, roundabouts reduce vehicle movements across traffic. Only a few studies have examined the safety benefits of roundabouts. One study of four intersections that were replaced with roundabouts in Maryland found a drop in crashes between 18 and 29 percent and a reduction in injury crashes between 63 and 88 percent. The cost of crashes at these locations – one measure of severity – was also reduced by 68 percent. Overall crashes on roundabouts were more minor than those at left turn locations. [9] Another study of roundabouts in several locations found a 51 percent reduction in crashes, including a 73 percent reduction in injury crashes and a 32 percent reduction in property-damage-only crashes for single-lane roundabouts. Multi-lane roundabouts only experienced a 29 percent reduction in crashes. [6]



MEDIAN TREATMENTS

Medians

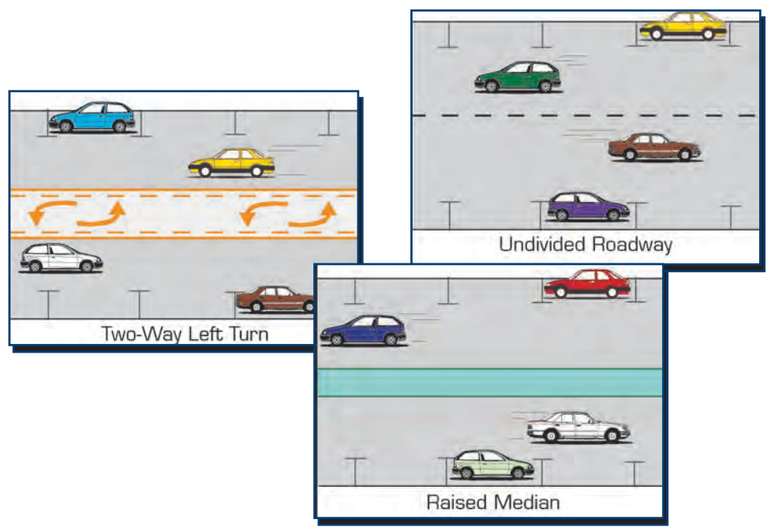
Median treatments for roadways represent one of the most effective means to regulate access, but are also the most controversial. The two major median treatments include two-way left turn lanes (TWLTL) and raised medians.



The safety benefits of median improvements have been the subject of numerous studies and syntheses. Studies of both particular corridors and comparative research on different types of median treatments indicate the significant safety benefits from access management techniques. According to an analysis of crash data in seven states, raised medians reduce crashes by over 40 percent in urban areas and over 60 percent in rural areas. [4]

A study of corridors in several cities in Iowa found that two-way left-turn lanes reduced crashes by as much as 70 percent, improved level of service by one full grade in some areas, and increased lane capacity by as much as 36 percent. [5]

Raised medians also provide extra protection for pedestrians. A study of median treatments in Georgia found that raised medians reduced pedestrian-involved crashes by 45 percent and fatalities by 78 percent, compared to two-way left-turn lanes. [12]



Business Concerns

Installing raised medians often raises serious concerns by the business community that local businesses that depend upon pass-by traffic (especially gas stations and fast-food restaurants [10]) will be adversely affected by medians. Though there are few studies of the actual impacts of medians on business sales, there are several surveys of business owner opinions. Surveys conducted in multiple corridors in Texas, Iowa, and Florida demonstrate that the vast majority of business owners believe there have been no declines in sales, with some believing there are actually improvements in business sales. [2,5,8] One study in Texas indicated that corridors with access control improvements experienced an 18 percent increase in property values after construction. [2]

Location	Owners Report No Decline in Business (%)
Texas (2)	93
Texas (3)	78 to 84
Iowa (5)	67 to 91

PURPOSE OF THE BROCHURE

This brochure serves as a guide to the major benefits of several access management techniques in use across the United States. The purpose of this brochure is to provide a comprehensive and succinct examination of the benefits of access management and address major concerns that are often raised about access management.

The benefits usually identified with access management include improved movement of through traffic, reduced crashes, and fewer vehicle conflicts. Most major concerns about access management relate to potential reductions in revenue to local businesses that depend on pass-by traffic.

This brochure does not describe the precise strategies that transportation departments should follow to implement an access management program, but rather provides an introduction to the key concepts. The brochure may also be a useful tool to distribute at public meetings for both general access management plans and specific applications of access management techniques.

This brochure describes the relevant benefits and issues with three key sets of access management techniques:

1. Access spacing, including spacing between signalized intersections and distance between driveways;
2. Turning lanes, including dedicated left- and right-turn lanes, as well as indirect left turns and U-turns, and roundabouts; and
3. Median treatments, including two-way left-turn lanes and raised medians.

WHAT IS ACCESS MANAGEMENT?

Access management is a set of techniques that state and local governments can use to control access to highways, major arterials, and other roadways. Access management includes several techniques that are designed to increase the capacity of these roads, manage congestion, and reduce crashes.

- Increasing spacing between signals and interchanges;
- Driveway location, spacing, and design;
- Use of exclusive turning lanes;
- Median treatments, including two-way left turn lanes (TWLTL) that allow turn movements in multiple directions from a center lane and raised medians that prevent movements across a roadway;
- Use of service and frontage roads; and
- Land use policies that limit right-of-way access to highways.

State, regional, and local governments across the United States use access management policies to preserve the functionality of their roadway systems. This is often done by designating an appropriate level of access control for each of a variety of facilities. Local residential roads are allowed full access, while major highways and freeways allow very little. In between are a series of road types that require standards to help ensure the free flow of traffic and minimize crashes, while still allowing access to major businesses and other land uses along a road,

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FOR MORE INFORMATION

http: / / www.accessmanagement.gov

FHWA Document Number FHWA-OP-03-066

Benefits of Access Management

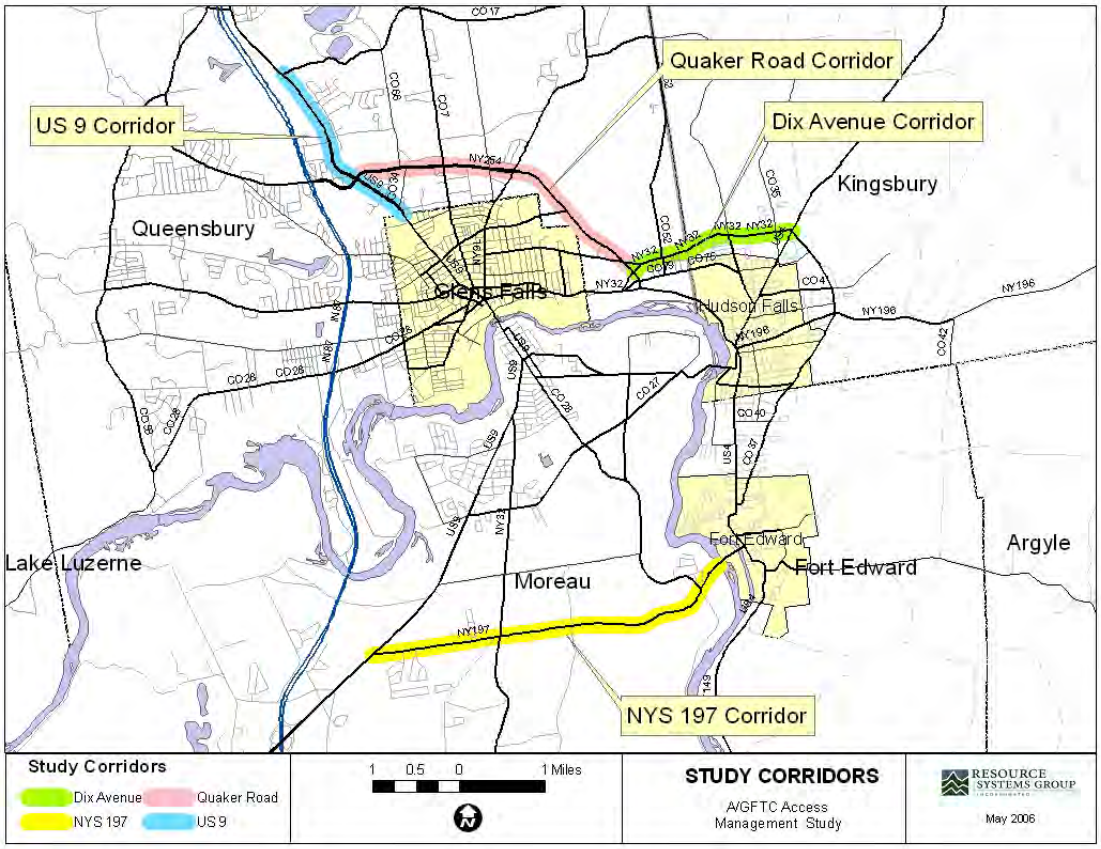
U.S. Department of Transportation
Federal Highway Administration

ACCESS MANAGEMENT CASE STUDIES

This section summarizes access management studies conducted for four highway corridors located around Glens Falls, New York (Figure 1):

- US 9 in Queensbury from Glens Falls to Round Pond Road;
- Quaker Road in Queensbury from US 9 to Dix Avenue;
- Dix Avenue (NYS 32) from Quaker Road in Queensbury to US 4 in Kingsbury; and
- NYS 197 in Moreau from US 9 to US 4 in Fort Edward.

Figure 1: Study Corridors



The complete study, which is available at the A/GFTC, includes an analysis of existing and future conditions, evaluates access management strategies, and discusses implementation methods and funding. The strategies are conceptual in nature and are intended to demonstrate how access management can improve the mobility, safety and community character of highway corridors in suburban and rural areas.

METHODOLOGY

The A/GFTC Access Management study utilizes conventional transportation planning and engineering methodologies related to congestion, safety, bicycle and pedestrian issues, and transit. The unique steps of the study are described below. For additional information on methodology and data sources, refer to the complete report (A/GFTC Access Management Study; 15 December 2007).

Access Management Inventory

The consultant evaluated each driveway along the four corridors. The field inventory captured information such as driveway location, type of land use and business, and an identification of access management issues such as: poor definition/continuous curb cuts; insufficient spacing between driveways; inadequate distance between intersections and driveways; multiple access points per parcel; and limited sight distance.

Congestion Analysis

In traffic engineering, the concept of Level of Service (LOS) is used to describe varying degrees of congestion as perceived by a driver. LOS uses a grading system from A through F that is related to the average delay a motorist experiences at an intersection and travel speed along a road segment. LOS A-C is generally considered acceptable and represents relatively free flow speeds along a roadway and short waits at an intersection (less than 30 seconds). LOS D is acceptable in urban areas and is characterized by mostly stable flow and moderate delays at intersections (30-55 seconds); and LOS E and F are characterized by unstable flow at slow speeds on a roadway and long waits and long lines of vehicles at intersections. LOS D was the target used in this study.

Future Year Scenarios

Traffic projections for the year 2030 were developed for the following three scenarios:

- **2030-1%**: Assumes base year (2006) traffic volumes increase by 1% per year and includes traffic from anticipated development projects. Anticipated development includes projects that local planners expect to be constructed within a few years.
- **2030-2%**: Assumes base year traffic volumes increase by 2% per year and traffic from anticipated development projects is included.
- **2030-Build-Out:** Base year traffic volumes were increased by 1% per year plus traffic assuming parcels adjacent to a corridor are developed to their full potential based on zoning, natural resource constraints, and other factors. This scenario was evaluated for the Quaker Road and NYS 197 study corridors only.

Table 1 identifies the scenarios evaluated within each corridor.

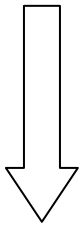
Table 1: 2030 Traffic Projection Scenarios

Corridor	2030 w/ 1% Background Growth	2030 w/ 2% Background Growth	2030 w/1% Background Growth plus Buildout
US 9	X	X	
Quaker Road	X	X	X
Dix Avenue	X	X	
NYS 197	X	X	X

Access Management Strategy Organization and Evaluation

The strategies evaluated are based on the principles of an effective access management plan which extend from the system-wide to location-specific levels:

System-wide



Location-specific

1. Provide a specialized roadway system based upon mobility for through traffic and access to adjacent land;
2. Provide appropriate intersection design, control, and spacing to provide efficient transitions from one roadway classification to another;
3. Limit direct access between adjacent land uses and higher speed roads while promoting access between land use and minor, low speed roads;
4. Limit or separate the number of conflict points between traffic entering and exiting driveways and streets; and
5. Remove turning traffic from through traffic lanes[1].

Strategies are organized into the categories described below. Each strategy category reflects one or more of the access management principles described above.

- Provide Specialized Roadway System – This strategy seeks to preserve the mobility function of arterial highways by providing alternate routes for local traffic on a network of new local streets, service roads and frontage roads. Broad areas for new local connections have been identified for each study corridor, but specific alignments or the type of facility have not been specified at this point in the planning process. (AM Principle 1)
- Provide Efficient Connections - This strategy focuses on the intersections that connect the principal arterials in each corridor to other arterials, collector and local streets. It involves

[1] Modified from the *Access Management Manual* (TRB, 2001)

adding capacity to intersections by installing traffic signals, adding turn lanes to existing intersections, or constructing roundabouts. (AM Principle 2)

- Driveway Reduction, Location, and Design Strategies - This section evaluates the corridor-wide effects on travel time and safety of reducing driveways for two scenarios. The "First Round" scenario includes driveways that could be eliminated incrementally as parcels are redeveloped and include (1) parcels that have more than one driveway, and (2) locations where parking lots on adjacent parcels could be connected allowing removal of at least one driveway. A second driveway reduction scenario is evaluated for each corridor that assumes 50% of the driveways could be eliminated. This type of large scale reduction would require major reconstruction of the arterial roadway. It could also depend to some degree on the expansion of the local street network to provide additional access between parcels. This scenario is conceptual and theoretical. It is not based on an actual design or elimination of specific driveways. It is useful nonetheless because it shows the potential benefits of a larger scale access management project. (AM Principles 3 and 4)
- Medians - Medians are used to manage or eliminate left turns, which are involved in more than two-thirds of all access related collisions. Medians also reduce congestion caused when left turning vehicles block traffic in a through lane. Two-way left-turn lanes (TWLTL) and non-traversable medians are the two options evaluated where appropriate for each corridor. The analysis shows the effect of medians on travel time and safety. (AM Principle 5)
- Community Character Enhancements - Access management strategies can improve aesthetics and often incorporate bicycle, pedestrian and transit facility enhancements. Before/after visualizations are presented for one location along each corridor to demonstrate the benefits of these types of enhancements. Although community character does not fit neatly into one of the five principles, it is an important benefit that helps to further justify access management improvements.

US 9 STUDY CORRIDOR

CHARACTERISTICS AND ISSUES

- The study area extends for approximately 2.25 miles from the Queensbury/Glens Falls municipal border to Round Pond Road within the Town of Queensbury.
- Retail is the predominant land use type. The corridor includes some older commercial establishments between the Glens Falls municipal line and Quaker Road, more recent large discount chains between Quaker Road and Sweet Road, and older commercial development between Sweet Road and Round Pond Road. Most of the road frontage is occupied. Retail development creates internal circulation along a corridor as customers may visit several establishments on one major trip to the area. This dynamic adds short trips to the corridor that would be better served by connections between adjacent parcels and a supporting local street network.

Figure 2: US 9 Corridor

The southern end of the US 9 corridor includes a mix of older building many of which have wide open curb cuts. A two-way left-turn lane separates through and left-turning vehicles.

- US 9 is classified as a principal arterial, is owned by New York State and is maintained and operated by NYSDOT. Modifications to the roadway and its intersections, changes to existing driveways and construction of new driveways requires a NYSDOT Work Permit. The Work Permit ensures compliance with NYSDOT's Policy and Standards for Entrances to State Highways (Driveway Design Policy). The NYSDOT Driveway Design Policy currently includes guidelines and design standards that support best practices for access management as described in Chapter 2 of this guidebook.
- US 9 is located in the Town of Queensbury. The Town's zoning code requires coordination with NYSDOT and includes the following access management guidelines in Article 19 of its zoning code:
    - Limiting driveways to one per parcel (additional driveways are permitted if they do not degrade the safety and operation of the roadway or if they improve safety and operation).
    - Encouraging access to roadways of lower functional class when a parcel has access to two different roadways.
    - Sharing driveways and providing cross connections for abutting parcels.

- Providing adequate spacing between driveways.

The code identifies the roadways in Town that shall comply with its access management requirements which include US 9, Quaker Road, and Dix Avenue.

- The posted speed limit is 35 mph from Glens Falls to just south of Quaker Road and 40 mph for the remainder of the study corridor. The roadway cross-section consists of two travel lanes per direction between the Glens Falls municipal line and Sweet Road. The travel lanes are separated by a two-way left-turn lane that transitions to turning lanes at the major intersections. North of Sweet Road, the cross-section contains one travel lane in each direction and a two-way left-turn lane. There are sidewalks and curbing throughout the study corridor.
- Access management issues are most intense between the Glens Falls municipal line and Quaker Road and north of Montray Road. Both of these segments tend to have older developments. These sections also have elevated level of crashes.
- Only 15% of the driveways are free from access management issues. 53% of the driveways have 1 or 2 access management issues, while the remaining 31% of the driveways have 3 or 4 access management deficiencies.
- Having multiple access points per parcel is the most prevalent issue along the US 9 corridor, accounting for 30% of total access management deficiencies. Driveway spacing, poorly defined or continuous curb cuts, and poor alignment with opposite driveways each account for 20% of the total deficiencies.
- Under existing conditions, the major intersections in the corridor provide efficient connections between US 9 and the surrounding street system. The connection between US 9 and Quaker Road is projected to operate with high delays and long vehicle queues for the 2030-1% and 2030-2% scenarios. The US 9 intersection with Sweet Road, a local street, will operate poorly if background traffic grows by 2% per year.
- The road segment between Glenwood Avenue and Quaker Road has a crash rate higher than state averages. Prior to its reconstruction, the intersection of US 9 with Quaker Road was experiencing an elevated crash rate. The reconstruction should reduce the number of crashes occurring at that location.
- Sidewalks along US 9 are not separated from travel lanes by green strips and are interrupted and obscured by frequent driveways, particularly south of Quaker Road. There are several crosswalks located south of Quaker Road. However, north of Quaker Road, there is a 0.45 mile long gap between the only two crosswalks at Northway Plaza and Sweet Road. New crosswalks and pedestrian actuated signals were recently installed at the US 9-Quaker Road intersection as part of an overall plan for that location. The project also upgraded the sidewalks along all four approaches.

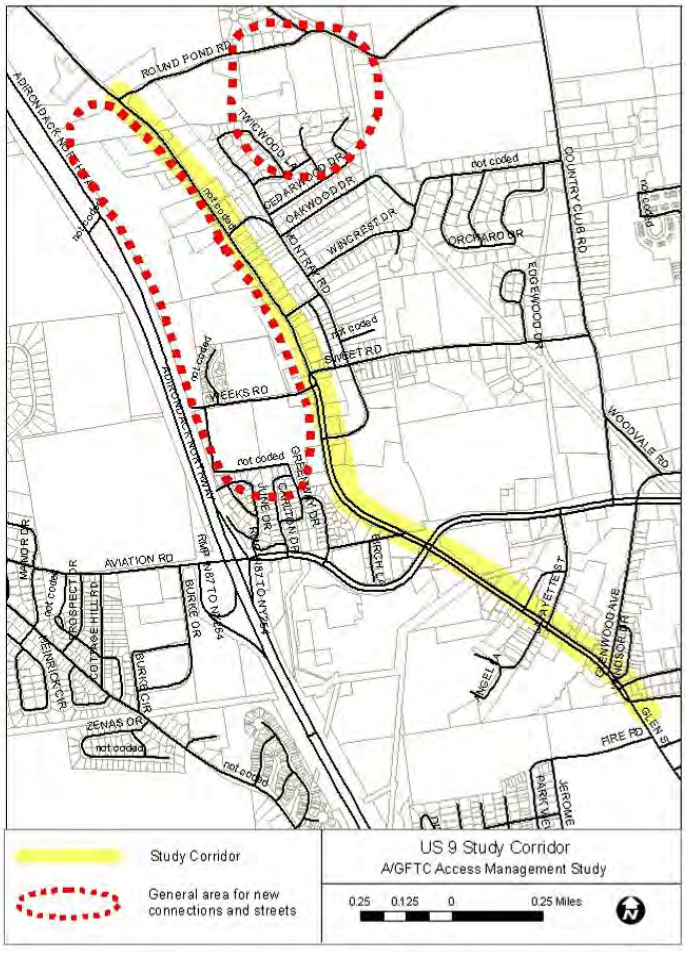
- Three GGFT fixed transit routes, all with ½ hour headways, serve portions of US 9. The transit system relies on informal stops for the majority of its service. There are no bus shelters or permanent structures built along the US 9 corridor to serve passengers waiting for a bus.

PROVIDE SPECIALIZED ROADWAY NETWORK – US 9 CORRIDOR

To provide alternative routes for traffic circulating within the corridor, new connections should be considered in the following areas (Figure 3):

- Between US 9 and I-87 north of Aviation Road. The connections would serve trips between the commercial businesses along the west side of the corridor. The connections could take the form of informal links between parking areas or a more formal street behind existing buildings. Extending the connection to Weeks Road would provide a link to a residential area. The connections should be circuitous and be designed for slow speeds to discourage use by through traffic.
- Connections to Round Pond Road and the residential neighborhood to the south. This connection would provide an alternate route for residents of that neighborhood to points northeast without having to access US 9.

Figure 3: Potential Areas for New Local Roads along the US 9 Corridor

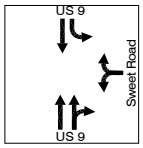
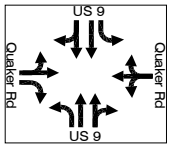
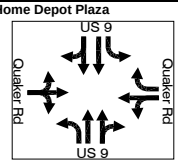
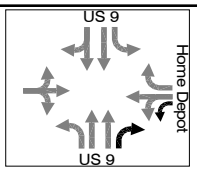
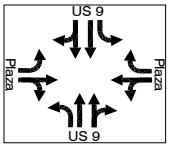
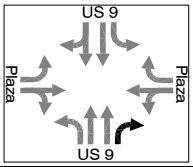
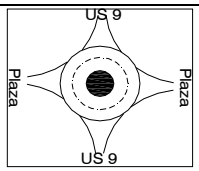
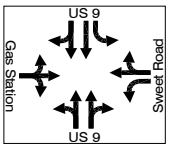
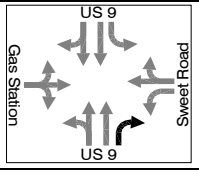


PROVIDE EFFICIENT CONNECTIONS – US 9 CORRIDOR

To provide efficient connections between different roadway classes, some intersection modifications will be necessary if traffic grows by 2% per year. Figure 4 provides schematics of existing lane

configurations at each study intersection and indicates the changes that should be considered to accommodate projected traffic volumes. No changes are necessary if traffic grows at 1% per year. If traffic grows at 2% per year, modifications are suggested for the Glenwood Avenue, Queensbury Plaza, and Home Depot intersections. A two lane roundabout would also provide adequate capacity at the US 9-Queensbury Plaza intersection.

Figure 4: US 9 Corridor Potential Intersection Modifications

Existing	1% Background Growth		2% Background Growth	
	Traffic Signal Alternatives	Roundabout Alternatives	Traffic Signal Alternatives	Roundabout Alternatives
US 9 - Sweet Road 	No Changes	No Changes	No Changes	No Changes
US 9 - Wal-Mart 	No Changes	No Changes	No Changes	No Changes
US 9 - Home Depot Plaza 	No Changes	No Changes		Not Justified
US 9 - Plaza 	No Changes	No Changes		
US 9 - Glenwood 	No Changes	No Changes		Not Justified

DRIVEWAY REDUCTION STRATEGIES – US 9 CORRIDOR

There are approximately 121 driveways along the US 9 study corridor. Of these, 45 First Round reductions are at locations with multiple driveways per parcel and where parking lots on adjacent parcels could be connected. As shown in Table 2, the first round of driveway reductions would decrease travel time in the study area by about 11% in the northbound direction and 18% in the southbound direction. In this study corridor, the 50% driveway reduction scenario is not significantly

different from the first round reduction. As a result, the travel time and delay changes are not significantly different either.

Table 2: Impact of Driveway Reduction on Travel Time and Delay for 2030-2% Scenario for the US 9 Corridor

Direction	121 Existing Driveways		First Round Driveway Reductions *(Less 45)*		50% Driveway Reduction *(Less 62)*	
	Travel Time	*Delay*	*Travel Time*	*Delay*	*Travel Time*	*Delay*
Northbound	7.48	3.99	6.63	3.14	6.51	3.02
	Change relative to existing:		*-11%*	*-21%*	*-13%*	*-24%*
Southbound	7.19	3.70	5.88	2.39	5.85	2.36
	Change relative to existing:		*-18%*	*-35%*	*-19%*	*-36%*

Eliminating driveways improves the overall LOS rating along a few segments. However, the driveway reductions would not by themselves result in acceptable levels of service along the corridor (Table 3).

Table 3: Impact of Driveway Reduction on Travel Speed and LOS for 2030-2% Scenario by US 9 Segment[2]

Segment	Direction	Posted Speed	121 Existing Driveways		First Round Driveway Reductions *(Less 45)*		50% Driveway Reduction *(Less 61)*	
			Speed *(mph)*	LOS	Speed *(mph)*	LOS	Speed *(mph)*	LOS
Glenwood to Queensbury Plaza	Northbound	35	21.9	D	25.0	C	26.4	C
	Southbound		29.5	B	30.8	B	33.5	B
Queensbury Plaza to Quaker Rd	Northbound	35	9.1	F	9.1	F	9.1	F
	Southbound		19.9	D	22.0	D	22.0	D
Quaker Rd to Home Depot Plaza	Northbound	40	5.1	F	6.3	F	6.3	F
	Southbound		8.3	F	13.1	E	11.9	F
Home Depot Plaza to WalMart	Northbound	40	33.8	B	34.4	B	35.1	A
	Southbound		10.5	F	13.6	E	13.6	E
WalMart to Sweet Road	Northbound	40	33.4	E	36.7	E	37.9	E
	Southbound		35.7	E	38.2	E	39.2	E
Sweet Road to Round Pond Road	Northbound	45	33.4	E	36.7	E	37.9	E
	Southbound		35.7	E	38.2	E	39.2	E

Shading indicates improved LOS relative to existing

MEDIAN OPTIONS – US 9 CORRIDOR

Table 4 shows the effect of reduced driveways and a non-traversable median on segments with crash rates in the corridor. The crash rate would decrease significantly along these segments by eliminating a relatively small number of driveways. Overall, eliminating driveways is more effective at reducing the crash rates than installing a non-traversable median. If driveway reductions and the non-traversable median are combined, the crash rates would decrease significantly.

The Critical Accident Rate is currently exceeded on the Glenwood to Lafayette segment (critical accident rate = 7.47). The reductions in the crash rate on this segment associated with the proposed improvements are projected to bring the crash rates below the critical rate. The current crash rate exceeds the statewide average crash rate (5.05) between Glenwood and Quaker Road. The improvements will not bring the crash rates below this level but will reduce them dramatically.

[2] In some segments more driveways are reduced in the First Round Driveway Reductions than with a flat 50% Driveway Reduction. In those locations, performance is better in the First Round Reduction scenario.

Table 4: Effect of Driveway Reduction and Median Options on Crash Rates along the US 9 Corridor

Segment	Length (Miles)	**Crash Rate** *(Crashes per Million VMT)*	First Round Driveway Reductions	Revised Crash Rates			% Change on Crash Rate		
				First Round Driveway Reductions	Non Traversable Median (NTM)	Eliminate Drives and NTM	First Round Driveway Reductions	Non Traversable Median (NTM)	Eliminate Drives and NTM
Glenwood to Lafayette	0.21	7.70	-4	6.49	6.69	5.57	-16%	-13%	-28%
Lafayette to Quaker Road	0.39	6.06	-6	5.82	5.46	5.15	-4%	-10%	-15%
Northway Plaza to Montray Road	0.28	2.44	-6	1.72	2.09	1.46	-29%	-14%	-40%
Montray Road to Sweet Road	0.17	0.93	-4	0.63	0.8	0.54	-32%	-14%	-42%
						Weighted Average	-18%	-12%	-29%

COMMUNITY CHARACTER ENHANCEMENTS – US 9 CORRIDOR

Figure 5 demonstrates how access management changes in the US 9 corridor could improve community character and incorporate pedestrian and transit facilities enhancements.

Figure 5: US 9 Corridor Community Character Enhancements with Access Management

Existing Conditions

Phase I. Shorten & consolidated curb cuts, new curbing, painted center median, added green strip, improved sidewalks, new street trees

Phase II: New site furniture, including trash receptacles and pedestrian-scaled lighting, bus shelter.

Phase III: Addition of raised, landscaped median.

Visualization by Saratoga Associates

DIX AVENUE CORRIDOR

SUMMARY OF CHARACTERISTICS AND ISSUES

- The study corridor is approximately 2.0 miles long and extends between the Quaker Road/Highland Ave intersections in Queensbury to the Dix Avenue intersection with US 4 in Kingsbury.
- This study corridor contains a diverse mix of small scale commercial establishments, homes, and a school that front the roadway. In most cases, the parcels are small. Most of the land north of Dix Ave beyond abutting parcels is open.

Figure 6: Dix Avenue

The Dix Avenue corridor contains a mix of residential, commercial, and institutional uses. There are many small parcels and the buildings are relatively close to the roadway.

- Dix Avenue is classified as a principal arterial, is owned by New York State and is maintained and operated by NYSDOT. It is also part of the National Highway system (NHS). Modifications to the roadway and its intersections, changes to existing driveways and construction of new driveways must comply with NYSDOT's Driveway Design Policy. The NYSDOT Driveway Design Policy currently includes guidelines and design standards that support best practices for access management as described in Chapter 2 of this guidebook.
- The western end of the study corridor is located in the Town of Queensbury and is subject to the access management guidelines in Article 19 of the Queensbury zoning code. The remainder of the corridor is in the Town of Kingsbury. The site plan review process in the Kingsbury zoning code considers the adequacy and arrangement of traffic access and circulation, but no specific guidelines for access management are included. The site plan review process does require the identification of any state or county permits required for project execution (without specifying the permits). However, the zoning code could provide more specific direction on the types of permits, including the NYSDOT Highway Work Permit, required to ensure better coordination and early consideration of access management issues.
- The posted speed limit is 35 mph. The roadway cross-section consists of one travel lane in each direction without a median. There are no curbs and the shoulders are three-four feet wide. A sidewalk exists on the north side of the roadway (westbound direction) from US 4 to Feeder Street. There are no other sidewalks along the corridor, even adjacent to the elementary school.

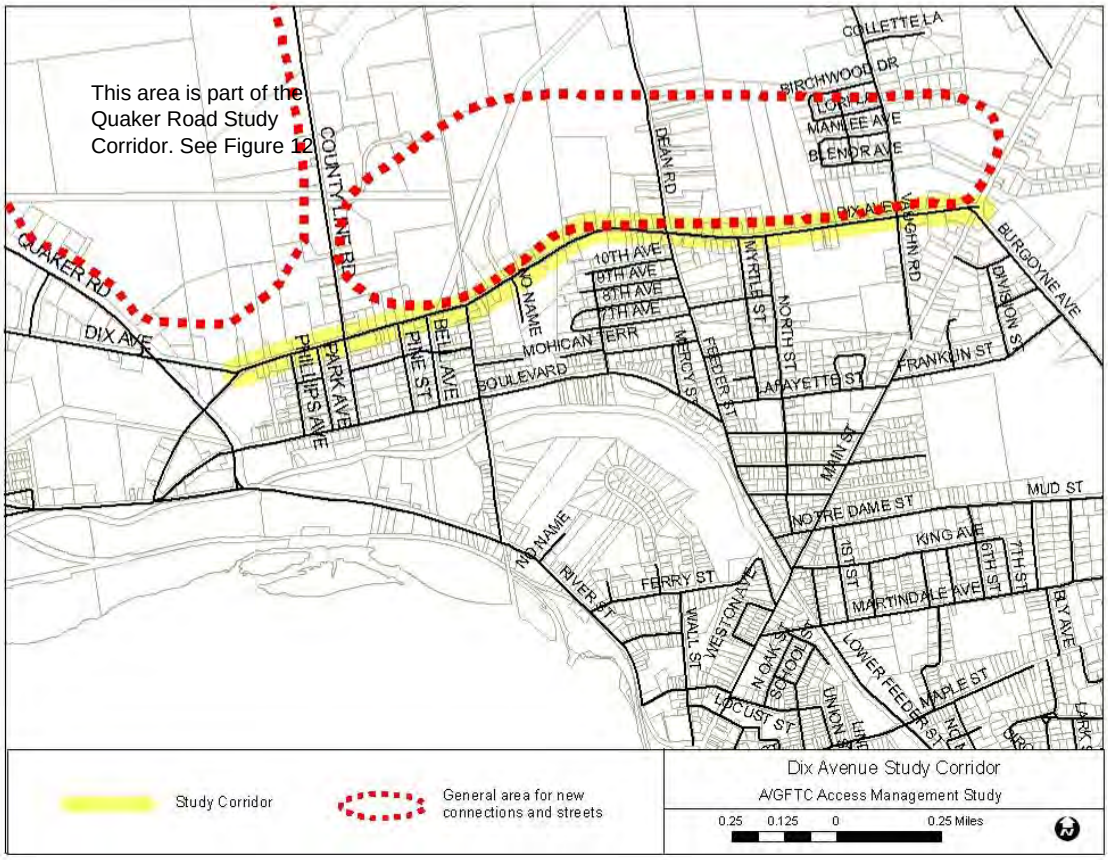
Vegetation, utility poles, and some buildings are close to the edge of roadway. Given the physical constraints, widening the road may not be feasible or desirable.

- The existing residential uses along the corridor are likely to redevelop into retail and other non-residential uses. The large amount of open land north of this study area may also attract development that will add traffic to the corridor. In addition, this roadway is part of the NHS.
- There are approximately 122 driveways and minor street intersections along this study area. Only 15% of the driveways are free from access management issues. 63% of the driveways have 1 or 2 access management issues, while the remaining 22% of the driveways have 3 or 4 access management deficiencies.
- Parcels with poorly defined or continuous curb cuts and inadequate driveway spacing are the two most prevalent issues along the Dix Avenue corridor. Parcel sizes are generally smaller along this corridor resulting in closely spaced driveways. Together these two deficiencies account for 58% of the total deficiencies. Poor driveway design will be addressed through application of NYSDOT's Policy and Standards for Entrances to State Highway. Because the parcels are small, addressing the spacing issue will require consolidating driveways to serve multiple parcels whenever feasible.
- The access management goal of providing efficient connections between different roadway classes is not satisfied along the corridor and will worsen as traffic continues to grow. Under existing conditions, traffic congestion is an issue at the Dix Avenue intersections with Queensbury Avenue, Feeder Street, and US 4. Congestion is projected at all major study intersections under the 2030-1% and 2030-2% scenarios.
- Relative to safety, crash rates at all study intersections and road segments along this corridor are lower than the state averages for similar facilities.
- One well-utilized GGFT fixed transit route serve portions of Dix Avenue. The transit system relies on informal stops for the majority of its service. A more extensive sidewalk network along this corridor would improve access to and from the transit service. In addition, there are no bus shelters or permanent structures built along the Dix Avenue corridor to serve passengers waiting for a bus.

PROVIDE SPECIALIZED ROADWAY NETWORK – DIX AVENUE CORRIDOR

As indicated in Figure 7, there is a well established local street grid south of Dix Avenue that collects and distributes trips within the corridor. A similar street grid pattern should be established north of Dix Avenue as that area develops.

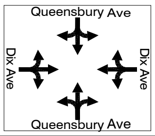
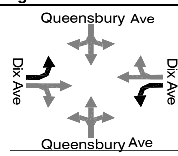
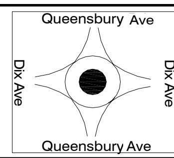
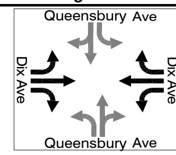
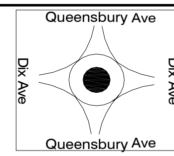
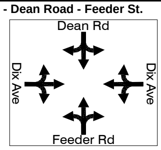
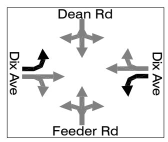
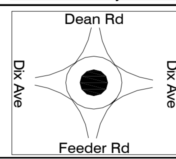
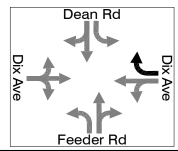
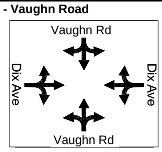
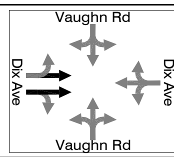
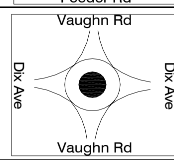
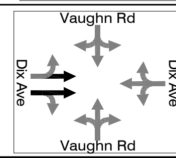
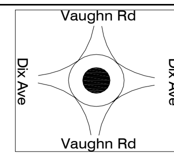
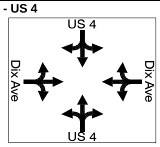
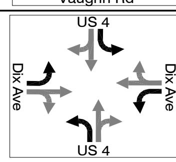
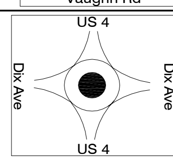
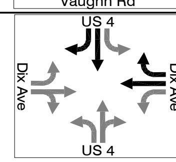
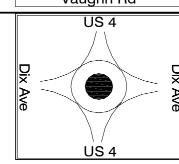
Figure 7: Potential Areas for New Local Roads along the Dix Avenue Corridor



PROVIDE EFFICIENT CONNECTIONS – DIX AVENUE CORRIDOR

Figure 8 shows the potential changes to the intersections along Dix Avenue to enhance connections with the surrounding street system. In the short-term, left turn lanes should be added on the Dix Avenue approaches to Queensbury Road and Feeder St/Dean Road. In the long term, additional lanes or roundabouts will be necessary at all of the study intersections to provide efficient connections. The Dix Avenue intersection with US 4 is particularly important because it connects two principal arterials that are also part of the National Highway System.

Figure 8: Dix Avenue Corridor Potential Intersection Modifications

Existing	1% Background Growth		2% Background Growth	
	Traffic Signal Alternatives	Roundabout Alternatives	Traffic Signal Alternatives	Roundabout Alternatives
Dix Ave - Queensbury Ave 	Upgrade the traffic signal to fully actuated control. 			
Dix Ave - Dean Road - Feeder St. 	Upgrade the traffic signal to fully actuated control. 			Not Justified
Dix Ave - Vaughn Road 				
Dix Ave - US 4 	Change signal timing for Eastbound and Westbound Lefts for Protected-Permissive phasing. 			

DRIVEWAY REDUCTION STRATEGIES – DIX AVENUE CORRIDOR

Based on a free flow speed of 40 miles per hour, the un-congested travel time through the corridor is 3.2 minutes. As shown in Table 5, the estimated travel time along Dix Avenue in 2030 is significantly greater in both directions. Eastbound travel time is higher because the traffic volumes are higher in that direction during the PM peak hour.

There are approximately 122 driveways along the Dix Avenue study corridor. Of these, there are 24 First Round reductions at locations with multiple driveways per parcel and where parking lots on adjacent parcels could be connected. This first round of driveway reductions would decrease travel time in the study area by about 24% in the eastbound direction (Table 5). The improvement is not as significant in the westbound direction because base travel time is better. Reducing driveways by 50% would improve travel time in the corridor significantly in each direction.

Table 5: Impact of Driveway Reduction on Travel Time and Delay for 2030-2% Scenario for the Dix Avenue Corridor

Direction	Existing Driveways *(122 Total)*		First Round Driveway Reduction *(Less 24)*		50% Driveway Reduction *(Less 61)*	
	Travel Time	*Delay*	*Travel Time*	*Delay*	*Travel Time*	*Delay*
Eastbound	19.22	16.00	14.62	11.40	11.66	8.43
	Change relative to existing		-24%	-29%	-39%	-47%
Westbound	6.62	3.40	6.34	3.12	5.64	2.42
	Change relative to existing		-4%	-8%	-15%	-29%

Travel time and delay in minutes

Driveway reductions would not eliminate all locations with poor LOS, but would help reduce congestion in the corridor (Table 12). Eliminating driveways, particularly between Quaker Road and Queensbury Avenue, improves the overall LOS rating in the westbound direction from D to C under the First Round and 50% driveway reduction scenarios. The 50% reduction scenario improves LOS along two other segments. Travel speeds increase along all segments under the First Round and 50% driveway reduction scenarios.

Table 6: Impact of Driveway Reduction on Travel Speed and LOS for 2030-2% Scenario for Dix Avenue Segments

Segment	Direction	Existing Driveways *(122 Total)*		First Round Driveway Reduction *(Less 24)*		50% Driveway Reduction *(Less 61)*	
		Speed *(mph)*	LOS	Speed *(mph)*	LOS	Speed *(mph)*	LOS
Quaker Rd to Queensbury Ave	Eastbound	8.8	F	9.7	F	11.9	E
	Westbound	17.8	D	18.2	C	19.8	C
Queensbury Ave. to Feeder Rd.	Eastbound	14.3	D	16.4	D	18.9	C
	Westbound	30.5	A	31.7	A	34.1	A
Feeder Rd to Vaughn Rd	Eastbound	5.4	F	7.2	F	9.0	F
	Westbound	20	C	22.3	C	25.2	B
Vaughn Rd to US 4	Eastbound	2	F	3.3	F	4.6	F
	Westbound	8.1	F	8.1	F	10.1	F

Shading indicates improved LOS relative to existing.

MEDIAN OPTIONS – DIX AVENUE CORRIDOR

Buildings are close to the edge of the roadway making major widening of Dix Avenue challenging and expensive. Therefore, a two-way left-turn lane combined with one travel lane in each direction is the best median alternative to consider. The ability to install a raised median is limited by the pavement width. Table 7 shows the effect of reduced driveways and a two-way left-turn lane on segments with existing crash rates in the corridor. Both strategies, reducing driveways and construction a two-way left-turn lane, would be effective on their own at reducing the crash rates along these segments. If combined together, crashes could be reduced by as much as 24% corridor-wide.

Table 7: Effect of Driveway Reduction and Median Options on Crash Rates along the Dix Avenue Corridor

Segment	Length (Miles)	Crash Rate (Crashes per Million VMT)	First Round Driveway Reduction	Revised Crash Rates			% Change on Crash Rate		
				First Round Driveway Reduction	TWLTL	Eliminate Drives w/ TWLTL	First Round Driveway Reduction	TWLTL	Eliminate Drives w/ TWLTL
Queensbury Blvd to Feeder St.	0.84	0.79	-11	0.73	0.68	0.61	-8%	-14%	-23%
Feeder to Myrtle	0.16	0.99	-5	0.96	0.96	0.82	-3%	-3%	-17%
Myrtle to Vaughn	0.40	0.87	-5	0.78	0.73	0.64	-11%	-16%	-27%
Vaughn to US 4	0.20	1.53	-1	1.40	1.26	1.15	-8%	-18%	-25%
						Weighted Average	-8%	-14%	-24%

COMMUNITY CHARACTER ENHANCEMENTS – DIX AVENUE CORRIDOR

Figure 12 demonstrates how access management changes on the Dix Avenue eastbound approach to Feeder Street could improve community character and incorporate pedestrian and bicycle facility enhancements.

Figure 9: Dix Avenue Corridor Community Character Enhancements with Access Management

Existing Conditions

Reduce curb cuts and define parking areas; add bike lane, curbing, street trees, sidewalk and clearly define pedestrian crossing areas. Close driveway nearest to the intersection and share access with interconnected parking and signage at edge.

Visualization by Saratoga Associates (visualizations not to scale)

QUAKER ROAD STUDY CORRIDOR

SUMMARY OF CHARACTERISTICS AND ISSUES

- The study corridor is approximately 3.5 miles long and extends between the Quaker Road intersections with US 9 and Dix Avenue (NYS 32) within the Town of Queensbury.
- Commercial and retail development is the predominant land use type between US 9 and Ridge Road. Most of the road frontage is occupied along this section. Between Ridge Road and Sanford Street, most of the adjacent land is open. Between Sanford Street and Dix Avenue, there is a concentration of retail and service businesses.
- Quaker Road is classified as a principal arterial, is part of the National Highway System and is owned and maintained by Warren County. Work in the right-of-way, including driveway modifications, requires a work permit from the County. Warren County has adopted the NYSDOT Driveway Design Policy as its standard ensuring that best practices in access management are implemented as parcels are developed. In addition, all development along Quaker Road, which is located within the Town of Queensbury, must comply with the access management guidelines in Article 19 of the zoning code.

Figure 10: Quaker Road

West of Ridge Road, Quaker Road has two lanes in each direction and a painted median that converts to left turn lanes at the major intersections.

- The posted speed limit is 40 mph. Between US 9 and Ridge Road, the roadway cross-section consists of two travel lanes in each direction separated by a large painted median (not a two-way left-turn lane). Existing set-backs are significant and there appears to be adequate room for alternative cross-section designs. Between Ridge Road and Dix Avenue, the cross-section consists of one travel lane in each direction without a median. There are no sidewalks or curbs along this corridor.
- This corridor has intense commercial uses at its western end, moderately intense commercial uses at its eastern end, and a significant amount of undeveloped land in between. Because of this vacant land, the evaluation of this corridor includes a build-out analysis.
- There are approximately 85 driveways along the study corridor. While the majority of driveways have at least one access management issue, the most intense access management problems are located between Ridge Road and Bay Road. Having multiple driveways per parcel is the most prevalent issue along the Quaker Road corridor. Driveway design (width, definition, radii, etc) is

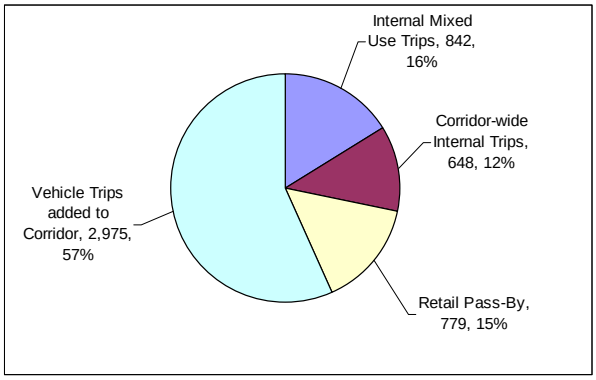
not as significant an issue in the corridor because the developments along Quaker Road tended to be more recent construction and have been guided by NYSDOT and Town of Queensbury access management regulations.

- Driveway consolidation and sharing access between adjacent parcels should be pursued in the corridor. These strategies reduce the number of access points, increase spacing between driveways, and create opportunities to re-align with driveways on the opposite side of the roadway. Additionally, parallel side access roads, such as the East Quaker Service Road, should be considered for future developments.
- Under 2006 conditions, the access management goal of providing efficient connections between different roadway classes is for the most part satisfied. Although long vehicle queues occur at a few approaches, the intersections operate with minimal delay. Congestion is projected to spread under all three 2030 scenarios. Modifications to the intersections will be necessary to maintain minimal delay in the long-term.
- Relative to safety, crash rates at all study intersections and road segments along this corridor are lower than the state averages. Regardless, crashes have occurred along many of the Quaker Road segments and access management can help reduce further collisions along the corridor.
- There are no sidewalks or crosswalks along Quaker Road. It has paved shoulders ranging between six and eight feet, wide enough to accommodate on-road bicycle travel. Along Quaker Road, frequent conflict points caused by closely spaced driveways is the most common access management issue that affects traveling conditions for cyclists. Other factors such as the amount of truck traffic and speed may also make this section of Quaker Road a less attractive route for many cyclists. However, it should provide for connections from the commercial areas around US 9 and Quaker Road to and from the Warren County Bikeway and the bicycle route along Bay Road and Bay Street recommended in the A/GFTC Bicycle and Pedestrian Plan. While the current developments on this corridor are not easily served by pedestrians, if they are redeveloped pedestrian amenities should be included.
- Two GGFT fixed transit routes serve portions of Quaker Road. The transit system relies on informal stops for the majority of its service. The lack of sidewalks on Quaker Road reduces access to and from the transit service. In addition, there are no bus shelters or permanent structures built along the Quaker Road to serve passengers waiting for a bus.

PROVIDE SPECIALIZED ROADWAY NETWORK – QUAKER ROAD CORRIDOR

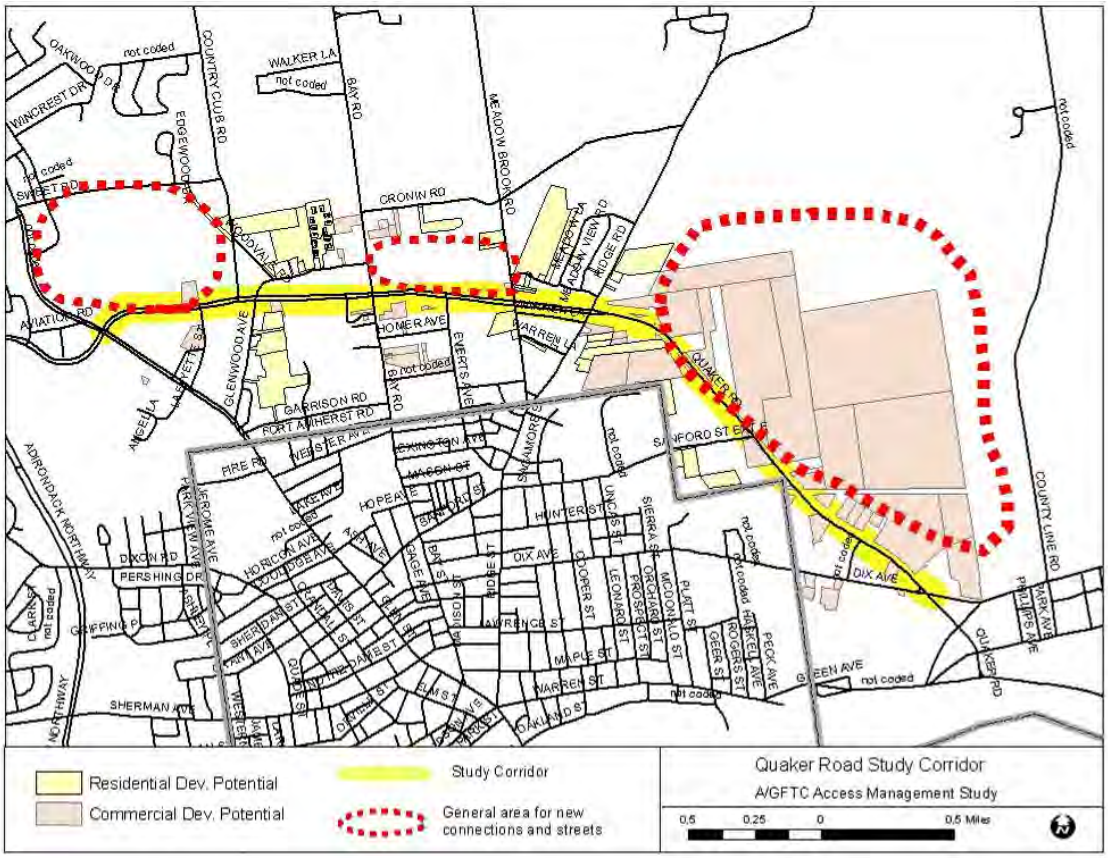
On the western end of the corridor the existing land use that fronts the corridor is predominantly retail and commercial. The build-out analysis indicates the potential for residential development along the western end of the corridor. The mix of retail, commercial and residential land uses will generate circulation within the corridor that should be supported by a local street system. On the eastern end of the corridor, large vacant parcels have potential for additional commercial and retail development. The land uses within these parcels will generate internal travel demand that should be supported by an internal street system. They will also generate trips between other areas of the corridor. The analysis of the build-out land use suggests that almost 30% of the traffic generated by new development will occur within the corridor (Figure 11).

Figure 11: Breakout of Quaker Road Build-out Trip Generation



Similar to Dix Avenue, there is a well developed street network south of Quaker Road that provides alternate routes for local traffic. North of Quaker Road, the local road system is less dense as it extends into a more rural area. Figure 12 shows areas north of Quaker Road where new local roads should be developed to serve circulation within the corridor.

Figure 12: Potential Areas for New Local Roads along the Quaker Road Corridor



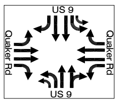
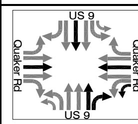
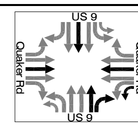
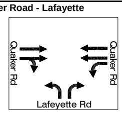
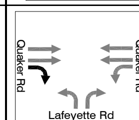
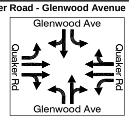
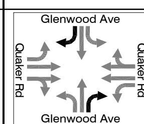
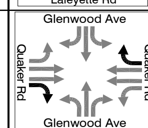
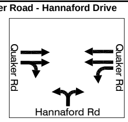
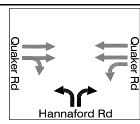
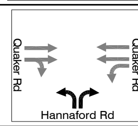
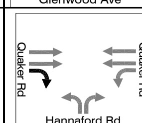
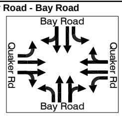
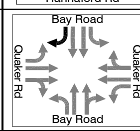
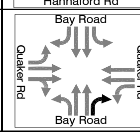
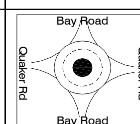
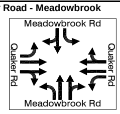
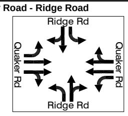
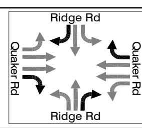
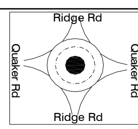
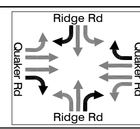
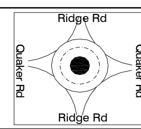
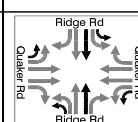
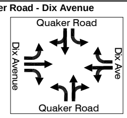
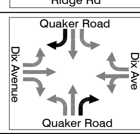
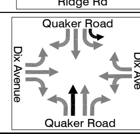
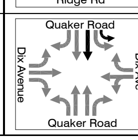
PROVIDE EFFICIENT CONNECTIONS – QUAKER ROAD CORRIDOR

Figure 13 shows the potential changes to the intersections along Quaker Road to enhance connections with the surrounding street system.

At the Quaker Road-US 9 intersection, three through lanes would be necessary to accommodate traffic projections under the 2030-2% growth scenario. No additional lanes would be necessary for the 2030-1% and 2030-Build-out scenarios. The 2030-2% scenario results in very high traffic volumes through this intersection because the base volumes are large to begin with. Three through lanes would result in significant impacts and it is unlikely that volumes will reach that high. Expanding the local street system will also reduce traffic through this intersection.

To maintain their ability to provide connections between Quaker Road and other roadway classes, additional capacity will be necessary at other intersections in the corridor as traffic grows.

Figure 13: Quaker Avenue Corridor Potential Intersection Modifications

Existing	1% Background Growth		2% Background Growth		Build Out Scenario	
	Traffic Signal Alternatives	Roundabout Alternatives	Traffic Signal Alternatives	Roundabout Alternatives	Traffic Signal Alternatives	Roundabout Alternatives
US 9 - Quaker Road 	No Changes	No Changes		Not Justified		Not Justified
Quaker Road - Lafayette 	No Changes	No Changes	No Changes	No Changes		Not Justified
Quaker Road - Glenwood Avenue 	Changed timing on SBL and NBL to protected-permissive phasing.	Not Justified		Not Justified		Not Justified
Quaker Road - Hannaford Drive 		Not Justified		Not Justified		Not Justified
Quaker Road - Bay Road 	No Changes	No Changes		Not Justified		
Quaker Road - Meadowbrook 	Changed phasing for EBL and WBL to protected phasing.	Not Justified	No Changes	No Changes	No Changes	No Changes
Quaker Road - Ridge Road 						2-Lane Roundabout fails
Quaker Road - Dix Avenue 		Not Justified		Not Justified		2-Lane Roundabout fails on initial analysis. However it is close enough that it should not be fully ruled out.

DRIVEWAY REDUCTION STRATEGIES – QUAKER ROAD CORRIDOR

Based on a free flow speed of 40 miles per hour, the un-congested travel time through the corridor is 5.4 minutes. As shown in Table 8, the estimated travel time along Quaker Road in 2030 is significantly greater in both directions (8.3 and 9.9 minutes).

There are approximately 85 driveways along the Quaker Road study corridor. Of these, there are 24 First Round reductions at locations with multiple driveways per parcel and where parking lots on adjacent parcels could be connected. This first round of driveway reductions would decrease travel time in the study by 3 and 6% in the westbound and eastbound directions, respectively (Table 5). The

improvement is not as large in the Quaker Road corridor because the projected travel speeds, without reducing driveways, are higher than the Dix Avenue and US 9 corridors.

Table 8: Impact of Driveway Reduction on Travel Time and Delay for 2030-2% Scenario for the Quaker Road Corridor

Direction	Existing Driveways *(85 Total)*		First Round Driveway Reduction *(Less 24)*		50% Driveway Reduction *(Less 43)*	
	Travel Time	*Delay*	*Travel Time*	*Delay*	*Travel Time*	*Delay*
Eastbound	8.30	2.94	7.81	2.45	7.59	2.45
	Change relative to existing		-6%	-17%	-8%	-17%
Westbound	9.99	4.64	9.65	4.30	9.42	4.30
	Change relative to existing		-3%	-7%	-6%	-7%

Travel time and delay in minutes

Although driveway reductions could improve the LOS rating on two segments, overall this strategy would not result in significant change throughout the corridor (Table 9).

Table 9: Impact of Driveway Reduction on Travel Speed and LOS for 2030-2% Scenario for Quaker Road Segments[3]

Segment	Direction	Existing Driveways *(85 Total)*		First Round Driveway Reduction *(Less 24)*		50% Driveway Reduction *(Less 43)*	
		Speed *(mph)*	LOS	Speed *(mph)*	LOS	Speed *(mph)*	LOS
US 9 to Layfayette Road	Eastbound	26.1	C	26.8	C	28.1	C
	Westbound	10.4	F	11.7	F	12.4	F
Layfayette Rd to Glenwood Ave	Eastbound	20.4	D	21.6	D	22.2	C
	Westbound	28.6	B	29.8	B	30.4	B
Glenwood Ave to Hannaford Dr.	Eastbound	35.6	A	36.3	A	37.4	A
	Westbound	16.4	E	16.4	E	16.8	E
Hannaford Dr. to Bay Road	Eastbound	13.1	E	15.6	E	14.4	E
	Westbound	23.1	C	23.1	C	23.1	C
Bay Rd to Meadow Brook	Eastbound	29.6	B	32.4	B	33.8	B
	Westbound	22.3	C	23.2	C	23.9	C
Meadow Brook to Ridge Rd	Eastbound	15	E	17.6	D	18.9	D
	Westbound	18.9	D	18.9	D	18.9	D
Ridge Rd to Dix Avenue	Eastbound	29.1	B	29.8	B	30.4	B
	Westbound	29.6	B	29.7	B	30.2	B

Shading indicates improved LOS relative to existing.

MEDIAN OPTIONS – QUAKER ROAD CORRIDOR

Quaker Road can be divided into two segments based on its cross section. From US 9 to Ridge Road, the cross section consists of two lanes in each directions separated by a painted median. Because the painted median does not create a physical barrier, it effectively functions as a two-way left-turn lane. Table 10 shows the potential safety effect of a raised non-traversable median with and without driveway reductions. The changes are relative to a cross-section with a two-way left-turn

[3] In some segments more driveways are reduced in the First Round Driveway Reductions than with a flat 50% Driveway Reduction. In those locations, performance is better in the First Round Reduction scenario.

lane. In this particular case, eliminating the first round driveways would be slightly more effective at reducing the crash rate than installing a non-traversable median (19% versus 15% reduction). If both strategies are combined, the crash rate would decrease by 30%.

Table 10: Effect of Driveway Reduction and Median Options on Crash Rates along the Quaker Road: US 9 to Ridge Road

Segment	Length (Miles)	Crash Rate (Crashes per Million VMT)	First Round Driveway Reduction	Revised Crash Rates			% Change on Crash Rate		
				Eliminate Drives	Non Traversable Median (NTM)	Eliminate Drives w/ NTM	Eliminate Drives	Non Traversable Median (NTM)	Eliminate Drives w/ NTM
Ridge Road to Meadowbrook	0.29	0.26	-3	0.21	0.22	0.18	-21%	-17%	-32%
Meadowbrook to Everts Ave	0.26	0.59	-4	0.46	0.50	0.39	-22%	-15%	-34%
Bay Road to Glenwood	0.45	1.17	-4	0.85	1.00	0.73	-27%	-14%	-37%
Glenwood to Country Club Road	0.07	0.68	-1	0.54	0.58	0.46	-21%	-15%	-33%
Country Club Road to Lafayette Road	0.15	0.16	0	0.00	0.14	NA	0%	-12%	NA
Lafayette Road to US 9	0.38	0.63	-3	0.54	0.54	0.46	-14%	-14%	-27%
						Weighted Average	-19%	-15%	-30%

Between Ridge Road and Dix Avenue, the cross section consists of one travel lane in each direction without a median. Therefore, as shown in Table 11, there are more options to consider along this segment. The first round driveway reductions and a two-way left-turn lane would have about the same effect at reducing the crash rate. The non-traversable median would have the biggest impact and if combined with driveway reductions would reduce the crash rates by as much as 37%.

Table 11: Effect of Driveway Reduction and Median Options on Crash Rates along the Quaker Road: Ridge Road to Dix Avenue

Segment	Length (Miles)	Crash Rate (Crashes per Million VMT)	First Round Driveway Reduction	Revised Crash Rates					% Change on Crash Rate				
				Eliminate Drives	TWLTL	Non Traversable Median (NTM)	Eliminate Drives w/ TWLTL	Eliminate Drives w/ NTM	Eliminate Drives	TWLTL	Non Traversable Median (NTM)	Eliminate Drives w/ TWLTL	Eliminate Drives w/ NTM
Dix Avenue to Highland Ave	0.17	2.33	-1	1.84	1.97	1.68	1.62	1.39	-21%	-15%	-28%	-30%	-40%
Dix Avenue to Ridge Road	1.70	0.39	-6	0.33	0.34	0.29	0.29	0.25	-16%	-13%	-26%	-26%	-36%
								Weighted Average	-16%	-14%	-26%	-27%	-37%

COMMUNITY CHARACTER ENHANCEMENTS – QUAKER ROAD CORRIDOR

Figure 14 demonstrates how access management changes such as consolidating access to one point on Quaker Road, shared parking, and a service road with side street access makes room for more streetscape, sidewalks, and a bus stop.

Figure 14: Quaker Road Corridor Community Character Enhancements with Access Management

Existing Conditions along Quaker Road between Everts Avenue and Meadowbrook Avenue. There are seven access points along the eastbound direction of this segment.

Primary access consolidated to one access point on Quaker Rd, secondary access from Meadowbrook Ave. and Everts Ave., interconnected shared parking, landscaping along road, sidewalks, bus stop.

Visualization by Saratoga Associates

NYS 197 STUDY CORRIDOR

SUMMARY OF CHARACTERISTICS AND ISSUES

- This study area is approximately 4.5 miles long and extends from between US 9 in Moreau, across the Hudson River, to US 4 in Fort Edward.
- Between the Hudson River and Gansevoort Road (NYS 32), the adjacent land use is predominantly rural with an occasional single family home. Between Gansevoort Road and US 9, the open land gives way to mostly low density residential uses. Small scale commercial uses are located around the intersection of NYS 197-US 9.
- NYS 197 is classified as a principal arterial, is part of the National Highway System, is owned by New York State and is maintained and operated by NYSDOT. Modifications to the roadway and its intersections, changes to existing driveways and construction of new driveways must comply with NYSDOT's Driveway Design Policy. The NYSDOT Driveway Design Policy currently includes guidelines and design standards that support best practices for access management as described in Chapter 2 of this guidebook.

Figure 15: NYS 197 Corridor

NYS 197 is a two-lane roadway through a rural – residential area. There are numerous driveways on the western end serving single family homes with direct access to the roadway.

- The NYS 197 study corridor is located within the Town of Moreau. The Town's zoning and subdivision regulations do not include access management guidelines or reference the NYSDOT Driveway Design Policy.
- The posted speed limit is 55 mph along most of the corridor between the Hudson River and US 9. The exception is near Gansevoort Road, where the posted speed limit is 45 mph. The roadway cross-section consists of one travel lane in each direction with wide shoulders. There are no curbs or sidewalks.
- Given the rural/residential nature of this corridor, access management issues are not as intense as the other three study corridors. 70% of the driveways in the corridor are free from access management issues. Locations with 1-2 access management issues are concentrated west of Gansevoort Road. Parcels with more than one driveway account for 62% of the total access management issues. Poorly defined or continuous curb cuts and closely spaced driveways account for 28% and 10% of the total access management issues respectively.
- Under existing conditions, the intersections provide efficient connections between different roadway classes. Some minor modifications would improve connections further at two locations.

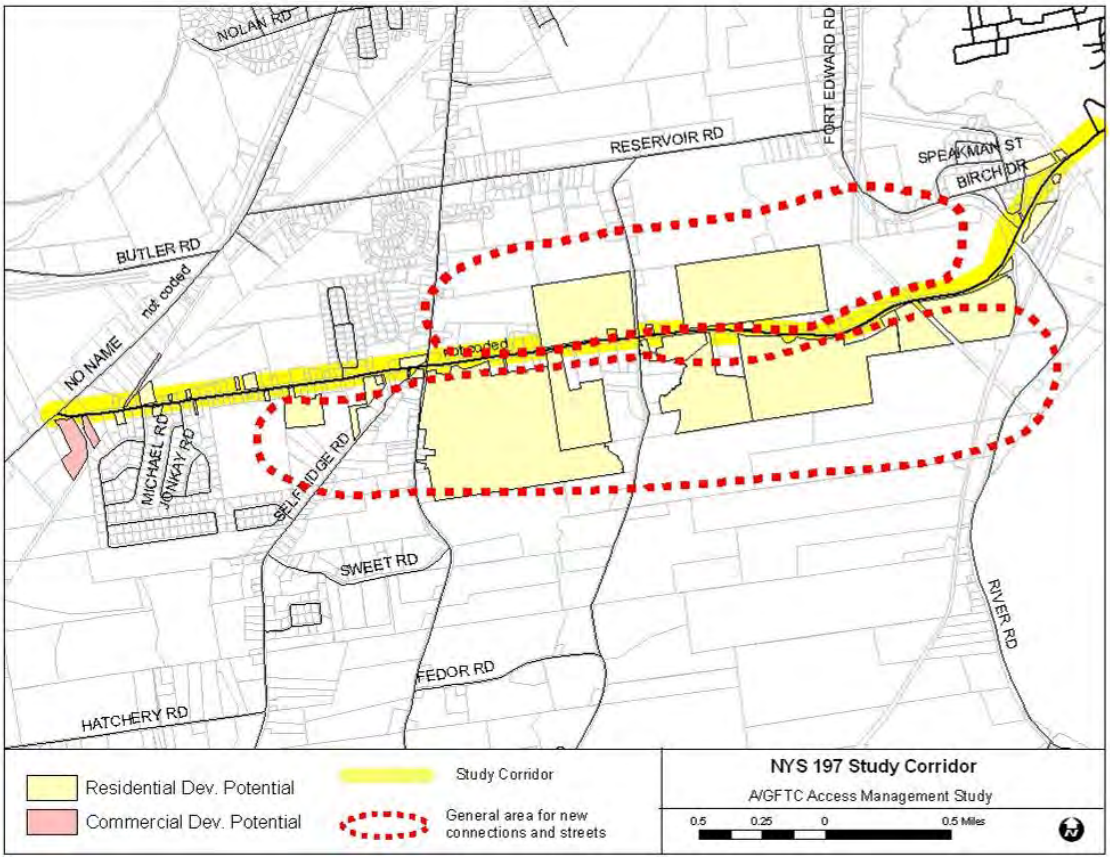
A protected left turn phase from US 9 to NYS 197 would improve that connection. Based on field observations, left turn lanes should be installed on the NYS 197 approaches to Gansevoort Road. Under the 2003-1% and 2030-2% scenarios, the intersection would continue to provide efficient connections. Under the 2030-Build-out scenario, long queues and delays are projected at each study intersection.

- Relative to safety, crash rates at all road segments along this corridor are lower than the state averages for similar facilities. The intersections of NYS 197-US 9 and NYS 197-Fort Edward Road have crash rates slightly higher than statewide averages.
- There are no sidewalks or crosswalks along the NYS 197 study corridor. Although the speeds are higher along NYS 197 (55 mph) the wide shoulders, relatively low traffic volumes, and rural land use make this a desirable route for cyclists. It is a designated bicycle route and part of the Saratoga Heritage Trail. Driveways are infrequent east of Gansevoort Road. West of Gansevoort Road, driveway density increases, creating more potential conflicts for cyclists.
- Fixed route transit service is not available along the NYS 197 study corridor.

PROVIDE SPECIALIZED ROADWAY NETWORK – NYS 197 CORRIDOR

Given the rural/residential nature of this corridor, the amount of internal circulation is not as significant as the other corridors. However, as the large residential parcels develop, their internal street systems should connect with adjacent neighborhoods. In addition, interconnecting streets systems of new residential developments should provide a route to the north-south streets in the corridor. These connections would collect traffic from new residential neighborhoods and concentrate their traffic at existing intersections (Figure 8).

Figure 16: Potential Areas for New Local Roads along the NYS 197 Corridor



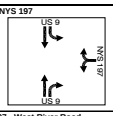
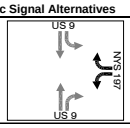
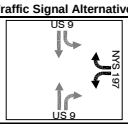
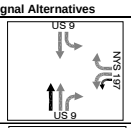
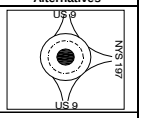
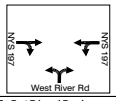
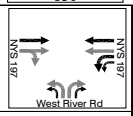
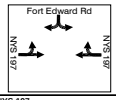
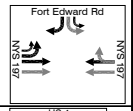
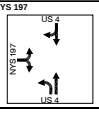
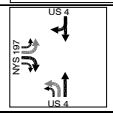
PROVIDE EFFICIENT CONNECTIONS – NYS 197 CORRIDOR

Under existing conditions, minor modifications to the NYS 197-US 9 and NYS 197-Gansevoort Road intersection should be implemented to separate left and through turning vehicles. The recommended changes include a protected left-turn phase from US 9 southbound to NYS 197 and the addition of left turn lanes on the NYS 197 approaches to NYS 32.

As shown in Figure 17, under the 2030-1% and 2030-2% scenarios, the NYS 197 westbound approach to US 9 should be widened to include exclusive left and right turn lanes. No additional modifications are necessary at any of the other intersections.

If the build-out scenario is realized, significant modifications would be necessary at each intersection.

Figure 17: NYS 197 Corridor Potential Intersection Modifications

Existing	1% Background Growth		2% Background Growth		Build Out Scenario	
	Traffic Signal Alternatives	Roundabout Alternatives	Traffic Signal Alternatives	Roundabout Alternatives	Traffic Signal Alternatives	Roundabout Alternatives
US 9 - NYS 197 	Signal timing was changed to Protected-Permissive for the Southbound Left-turn. 	Not Justified		Not Justified	Changed signal timing for the Southbound Left turn to Protected phasing. 	
NYS 197 - West River Road 	No Changes	No Changes	No Changes	No Changes	Implement new Fully Actuated Traffic Signal. 	2-Lane Roundabout fails
NYS 197 - Fort Edward Road 	No Changes	No Changes	No Changes	No Changes	Coordinate the traffic signal with West River Road. 	2-Lane Roundabout fails
US 4 - NYS 197 	Signal timing was changed to semi-actuated. The Northbound Left turn was changed to Pro-Permissive.	Not Justified	No Changes	No Changes	Upgrade existing traffic signal controller to fully actuated control. 	2-Lane Roundabout fails

DRIVEWAY REDUCTION STRATEGIES – NYS 197 CORRIDOR

Based on a free flow speed of 55 miles per hour, the un-congested travel time through the corridor is approximately 4.3 minutes. As shown in Table 12, the estimated travel time along NYS 197 in 2030 is somewhat greater in both directions (6.1 minutes).

There are approximately 125 driveways along the NYS 197 study corridor. Of these, there are 14 First Round reductions at locations with multiple driveways per parcel. Because the potential to eliminate driveways is small, the estimated travel time savings is also small. Even a 50% reduction in the number of driveways would not result in a large travel times saving.

Table 12: Impact of Driveway Reduction on Travel Time and Delay for 2030-2% Scenario for the NYS 197 Corridor

Direction	**Existing Driveways** *(125 Total)*		**First Round Driveway Reduction** *(Less 14)*		**50% Driveway Reduction** *(Less 63)*	
	Travel Time	*Delay*	*Travel Time*	*Delay*	*Travel Time*	*Delay*
Eastbound	6.11	1.79	5.96	1.64	5.81	1.49
	Change relative to existing		-2%	-8%	-5%	-16%
Westbound	6.12	1.80	6.11	1.79	5.78	1.46
	Change relative to existing		0%	-1%	-6%	-19%

Consistent with the results above, driveway reduction would not result in improved LOS within the corridor (Table 13).

Table 13: Impact of Driveway Reduction on Travel Speed and LOS for 2030-2% Scenario for NYS 197 Segments

Segment	Direction	Existing Driveways *(125 Total)*		First Round Driveway Reduction *(Less 14)*		50% Driveway Reduction *(Less 63)*	
		Speed *(mph)*	LOS	Speed *(mph)*	LOS	Speed *(mph)*	LOS
US 9 to Gansevoort Rd.	Eastbound	35.0	E	36.7	E	38.4	E
	Westbound	35.0	E	35.2	E	38.7	E
Gansevoort Rd to West River Rd.	Eastbound	41.7	E	42.0	E	42.5	E
	Westbound	41.5	E	41.5	E	42.7	E

MEDIAN OPTIONS – NYS 197 CORRIDOR

The First Round driveway reduction could reduce the crash rate by 5%. Installation of a two-way left-turn lane would have a significant effect on the crash rate (Table 14).

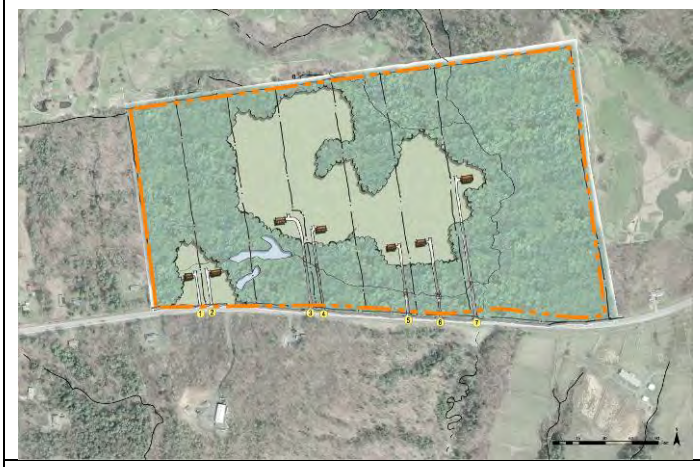
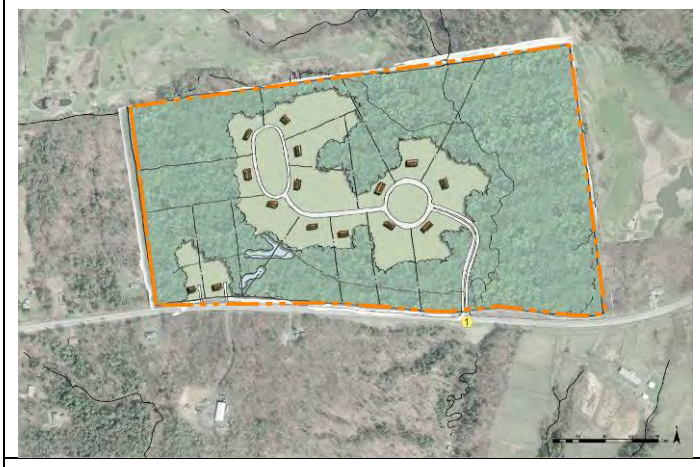
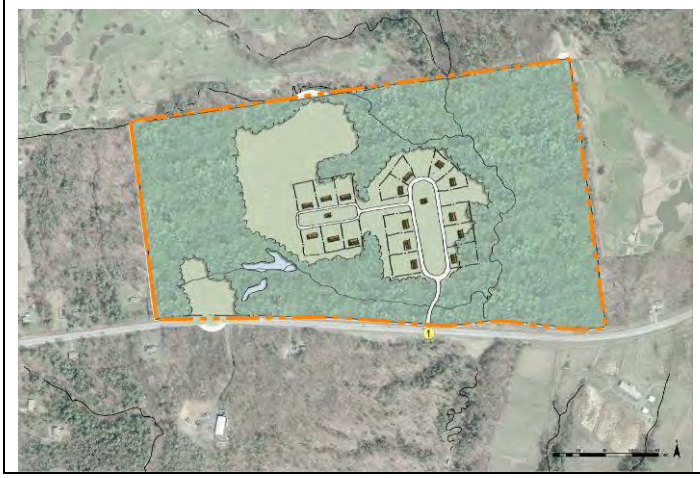
Table 14: Effect of Driveway Reduction and Median Options on Crash Rates along the NYS 197 Corridor

Segment	Length (Miles)	Crash Rate (Crashes per Million VMT)	First Round Driveway Reduction	Revised Crash Rates			% Change on Crash Rate		
				Eliminate Drives	TWLTL	Eliminate Drives w/ TWLTL	Eliminate Drives	TWLTL	Eliminate Drives w/ TWLTL
US 9 to Curtis Lane	1.20	0.75	-12	0.66	0.27	0.24	-12%	-64%	-68%
Curtis Lane to NYS 32	0.30	0.40	0	NA	0.15	0.15	0%	-62%	-62%
NYS 32 to Burt Road	0.40	0.80	-2	0.74	0.3	0.28	-8%	-63%	-65%
Burt Road to West River Road	1.70	0.15	0	NA	0.06	0.06	0%	-60%	-60%
						Weighted Average	-5%	-62%	-64%

COMMUNITY CHARACTER ENHANCEMENTS – NYS 197 CORRIDOR

Figure 18 demonstrates how access management can work in tandem with smart growth land use policies to conserve open space, protect the rural character of the corridor, allow more dwelling units and reduce the number of driveways.

Figure 18: NYS 197 Corridor Community Character Enhancements with Access Management

	Option 1. Conventional rural-residential housing development pattern. Seven dwelling units with seven separate driveways.
	Option 2. Property consolidation with medium density that allows 15 dwelling units and only three new driveways.
	Option 3. Property consolidation, conservation sub-division, common open space,16 units, 1 curb cut

SUMMARY

Five key strategies for Access Management are presented and discussed: Provide Specialized Roadway System; Provide Efficient Connections; Driveway Reduction, Location, and Design Strategies; Medians; and Community Character Enhancements. Specialized roadway systems protect arterials by providing alternate routes for local trips. Efficient connections increase intersection capacity and ease travel delays. Driveway reduction strategies can improve travel time and safety along corridors. Medians remove turning traffic from the travel stream, increasing overall ease of movement. Lastly, community character enhancements reinforce the principals of access management and help create successful projects.

One area is identified on either side of the Route 9 corridor as being suitable for additional local roadways. First round driveway reductions on this corridor would decrease travel time in the study area by about 11% in the northbound direction and 18% in the southbound direction. Driveway reductions have the most significant impact on crash reduction in the area, but installing a non-traversable median would further this effort. Community character enhancements along this corridor focus on improving pedestrians, bicycle and transit amenities.

The area north of the Dix Avenue corridor is suitable for development of additional local roadways. First round of driveway reductions in this corridor would decrease travel time in the study area by about 24% in the eastbound direction. A two-way left-turn lane combined with one travel lane in each direction is the only reasonable median alternative to consider. Installation of this median in addition to driveway reductions could reduce the number of crashes by as much as 24% corridor-wide. Community character enhancements along this corridor focus on improving pedestrians, bicycle and transit amenities.

Three areas north of Quaker Road are appropriate for additional local roadways. First round of driveway reductions would decrease travel time in the study by 3 and 6% in the westbound and eastbound directions, respectively. The Quaker Road corridor was divided into two sections for crash reduction analysis: from US 9 to Ridge Road and between Ridge Road and Dix Avenue. First round driveway reductions in conjunction with installation of a non-traversable median could reduce the crash rates for each section by up to 30% and 37%, respectively. Community character enhancements along this corridor focus on modifications to parking layouts allowing for shared parking and driveways by commercial properties.

Along the NYS 197 corridor, new residential roadways should be designed to create new network connections. Driveway reduction along this corridor would have a minimal impact. However, installation of a two-way left-turn lane could reduce the crash rate by more than 60%. In this area, community character enhancements should focus on encouraging new residential developments to limit access points onto the highway and instead create local residential roadways.

Intersection modifications are recommended for each corridor and are illustrated within the individual corridor sections above.

The underpinning for access management should be laid out in the comprehensive plan and implemented through the zoning ordinance, subdivision regulations, and site plan review. This chapter provides model regulations designed for New York State as well as national guidelines for access management regulations.

- Model Access Management Ordinance (NY State)
- Sample National Regulations
- Access Management Statues Prototype

Following these guidelines are some example access management regulations from municipalities across the Adirondack/Glens Falls region and across the state. Access management regulations are included for the following towns:

- Farmington
- Livonia
- Fort Edward
- East Fishkill
- Hartford
- Greenwich
- Salem
- Queensbury

MODEL ACCESS MANAGEMENT ORDINANCES - NEW YORK

Model Access Management Ordinance

DRAFT
June, 1998

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Realistically, this Ordinance is the product of many contributors and we'd particularly like to thank Pat Reece, Chair of the Town Planning Board in Canandaigua, Dick Twardokus and Rick Burgwardt of the NYSDOT design team, Steve Ferranti of SRF & Associates, Don Nims of Clark Patterson Associates, Greg Barbour of the MRB Group, and Brad Oswald and Lynne Webb of the NYSDOT Corridor Management Group for their insight into and many comments on the evolving Model. We would also like to thank Harry Willis of the New York State Department of State, Diane Carlton of the Otsego County Planning Department and Steve Somlo of the New York State Department of Transportation's Office of Legal Affairs for their review and thoughtful critiques. It has also benefited from questions and comments received during reviews of early drafts at the Genesee Transportation Council's Access Management Seminar, the 1997 New York State Association of Towns' annual meeting, and the 1997 New York Planning Federation's Annual Institute.

Although many individuals obviously helped shape this Model its final form reflects our determination as to the better path to follow given differing views and objectives. Even reasonable people can disagree ... so the Model must be evaluated carefully and adapted to the objectives and characteristics of each community. If there are questions regarding how this might be accomplished, or comments as to how the Model might be refined, please don't hesitate to contact us.

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Introduction

A high quality road system is one of a handful of major assets which determine the vitality and character of a municipality. And, as with other assets, planning, management and protection are necessary to ensure that this system is used to its best overall local advantage. Many local governments have, however, generally ceded these responsibilities to the State; particularly for the most heavily used and developed roads --intervening only when traffic problems generate substantial popular pressure for resolution or when the State proposes a project. Yet it is clear that local land-use planning, management and control can significantly reduce the transportation problems resulting from development, while promoting growth that is consistent with overall municipal objectives.

The Model Access Management Ordinance provided in this report is based on the premise that "local land-use management can better balance full development and the safe and efficient movement of traffic". It addresses those elements of development which are primarily culpable in the deterioration of local transportation systems. In determining how to apply this Model six general characteristics should be recognized.

First, it is planning oriented. It generally encourages and authorizes a Planning Board to require a number of actions by developers. The net result of this is to increase pressure to plan and evaluate development proposals on an integrated rather than single-site basis.

Second, it is neither proscriptive nor detailed. Specifications for many of the elements addressed in this Model vary significantly depending on the functions of the roadways it covers, the specific type of development proposed and the characteristics, needs and objectives of a community. In such cases the Model generally establishes a "goal" and defines how it is to be achieved.

Third, it is oriented towards environments which are lightly to moderately development. It can be applied in heavily developed areas but must be adapted to the specific circumstances -- particularly as regards spacing standards and methods of implementation.

Fourth, it is generally organized to be consistent with the structure of local zoning, subdivision and site-plan approval codes.

Fifth, it addresses the basic elements of access management. Other elements which are frequently included in local zoning, subdivision, and site-plan approval ordinances should be reviewed to ensure consistency with the Model Ordinance, these include:

frontage requirements --must allow the location of driveways within the minimum driveway spacing standards, else the minimum standards may not be enforceable.

setback requirements -- reasonable setbacks provide for the development of pedestrian and transit facilities as well as potential widening of the road.

lot depths requirements -- consistent lot depths in commercial areas provide an opportunity to develop rear service or access roads. These can be important in providing access between retail or commercial facilities as full build-out occurs.
buffer requirements -- many local ordinances require the construction of "impenetrable" buffer areas between retail and commercial facilities. These need to be reviewed and, if

necessary, revised to reflect the cross-access driveway and inter-connected parking requirements of the Model Ordinance.

sign and lighting standards -- Lighting and signs are necessary to provide drivers with advance warning of businesses and a clear view of how they are to enter, exit or move between parking areas. Inadequate sign regulations can create visual clutter that is both unattractive and distracting --creating unsafe driving conditions.

Finally, it is an extension of the matters addressed by municipal zoning and, thus, can be adapted and applied to its greatest effect only in communities which have zoning.

It should also be noted that in many areas access management plans have included elements that are specifically intended to enhance the aesthetic development of commercial areas, and specifically pedestrian facilities (sidewalks, rest areas, seating, and the like), landscaping and architectural standards.

This is a only a model and it must be adapted to meet the needs and objectives of a community. Regardless of the specific application (e.g. community-wide or within an overlay zone) or process followed, a detailed review of existing zoning, subdivision, and site-plan approval ordinances must be conducted. This review has 3 general objectives: (i) to assist in determining the best method of implementation; (ii) to eliminate conflicts and ensure conformity between the language and requirements of the Model and those contained in existing ordinances; and (iii) to eliminate redundancy --and thereby reduce complexity and the effort and costs potentially associated with adaptation.

Finally, additional information and discussion of a number of issues that might be used to expand or adapt the Model Ordinance are provided, *in italicized print*, in the appropriate sections.

Model Access Management Ordinance

Local Law Number XX of 199X
TOWN OF XX Access Management Law

Section I. Purpose

The purpose of this Ordinance is to provide for safe and efficient travel along public roads, prevent the adverse social and aesthetic impacts associated with strip road frontage development, and promote development which harmonizes with the objectives of the TOWN OF XX by providing clear and consistent access management standards to the development of properties abutting public roads.

(*Cite the section of State Law providing implementation authorization*.)

Section II. Applicability

This Ordinance shall apply to all properties abutting public roads or with direct access or common connections to public roads within the boundaries of the INSERT SPECIAL DISTRICT NAME created by LOCAL LAW OR RESOLUTION --TITLE, NUMBER AND DATE.

A variety of approaches might be used to implement or adapt this Model Ordinance. Ideally, access management requirements would flow from a Comprehensive Plan which addresses transportation needs and land-use planning and management on a broad basis. In practice, however, the majority of municipalities addressing access management have focused on specific corridors and/or discrete areas and the imposition of zoning, subdivision and site-plan requirements within an overlay zone, as was the case in the draft ordinance prepared for the Town of Farmington. This is anticipated to be the most common approach and so the Model has followed it. Nonetheless, it has drawbacks, specifically in that it can create undesirable pressure outside of the overlay zone and fails to address overall transportation needs and objectives --which are best considered at a "systems" level.

An alternative approach is to incorporate access management within existing zoning, subdivision and site-plan approval requirements, as was done for the draft code prepared for the Town of Canandaigua. In this case, specific elements from this Model were rolled into the zoning provisions for retail, commercial and industrial districts; the subdivision requirements were placed into the subdivision chapter and applied to all non-minor subdivisions; and, general access requirements were incorporated within existing subsections of the zoning code which addressed related issues including parking requirements, street layout and the like.

Other types of application are also possible. The Town of Penfield, for example, has applied access management on a property-by-property basis within a relatively small overlay zone. Alternatively, it appears that the Town of Pittsford will incorporate access management as "design guidelines" applicable to the short commercial stretch of Monroe Ave.

Section III. Conformance

The location and design of driveways and other site layout, parking and access management conditions shall conform to all Federal, State and local requirements, including and not limited to those established in this Ordinance. Further, the requirements of this Ordinance are not to be substituted for the zoning, subdivision and site plan approval provisions provided in CHAPTERS XX, XX AND XX OF THE TOWN OF XX but are to be superimposed over such provisions and should be considered as additional requirements.

Section IV. Definitions

> *The definitions contained in this Model Ordinance do not include those that are generally already included in Municipal codes. They must be compared with the definitions within municipal codes and any differences need to be reconciled.*

Access - A way or means of approach to provide vehicular or pedestrian entrance or exit to a property.

Access Connection - Any driveway, street, turnout or other means of providing for the movement of vehicles to or from the public road system or between abutting sites.

Access Management - The process of providing and managing reasonable access to land development while preserving the flow of traffic in terms of safety, capacity, and speed.

Corner Clearance - The distance from an intersection of a public or private road to the nearest access connection, measured from the closest edge of the driveway pavement to the closest edge of the road pavement.

Cross Access - A service road or driveway providing vehicular access between two or more contiguous sites so the driver need not enter the public road system.

Driveway - Any entrance or exit used by vehicular traffic to or from land or buildings abutting a road.

Driveway, Shared - A driveway connecting two or more contiguous properties to the public road system.

Functional Area (Intersection) - The area beyond the physical intersection of two roads that comprises decision and maneuver distance plus any required vehicle storage length.

Functional Classification - A system used to group public roads into classes according to their purpose in moving vehicles and providing access to abutting properties.

Nonconforming Access - Features of the access system of a property that existed prior to the effective date of this Ordinance and that do not conform with the requirements of this Ordinance.

Peak Hour Trips (PHT) - A weighted average vehicle trip generation rate during the hour of highest volume of traffic entering and exiting the site in the morning (a.m.) or the afternoon (p.m.).

Reasonable Access: The minimum number of access connections, direct or indirect, necessary to provide safe access to and from a public road, as consistent with the purpose and intent of this Ordinance and any other applicable plans and policies of the TOWN.

Restrictive Medians - A physical barrier in the roadway that separates traffic traveling in the opposite directions, such as a concrete barrier or landscaped island.

Road - A way for vehicular traffic, whether designated as a “street”, “highway”, “thoroughfare”, “parkway”, “through-way”, “avenue”, “boulevard”, “lane”, “cul-de-sac”, “place”, or otherwise designated, and includes the entire area within the right-of-way.

Road, Arterial - Roads serving comparatively large volumes of high speed (45 miles per hour or greater), long-distance or through traffic and which also provide access to abutting properties.

Road, Collector - Roads which provide access to abutting properties and which link development roads, collector roads, or other local roads to major traffic roads.

Roads, Development - Roads which are specifically constructed or intended to provide access to abutting properties for residential purposes or other high density uses as determined by the underlying zoning.

Road, Service (also Access Road) - A public or private road, auxiliary to and normally located parallel to a controlled access facility, that maintains local road continuity and provides access to properties adjacent to the controlled access facility.

Temporary Access - Provision of direct access to a road until that time when adjacent properties develop, in accordance with a joint access agreement or frontage road plan.

Section V. Standards and Requirements

One of the most important objectives of access management is reducing conflicts, particularly along the most heavily traveled roadways. The best methods of achieving a reduction in conflicts is by reducing the number of conflict points and separating through from local traffic. The State accomplishes this by purchasing access rights along higher functional class facilities (e.g. the interstate highways).

Municipal governments can bring land-use development and transportation into balance, and also reduce conflict points, through appropriate limitations to the number of driveways to individual properties and driveway spacing requirements. Conflicts can be further reduced along the most heavily traveled roads by ensuring that access is provided to the lowest functional class road serving the proposed development as well as establishing provisions for vehicles to move between parking areas to access abutting properties --rather than along the road.

A. Access Requirements

1. General

a. The site layout, location and design of driveways, parking, and other access management requirements should be based on full permissible development of a property.

b. Driveways should be limited to one per property. More than one driveway may be permitted if:

i. the additional driveway(s) does not degrade traffic operations and safety on State or local roads; and

ii. the additional driveway(s) will improve the safe and efficient movement of traffic between the property and the road.

c. Driveways to properties with frontage on two or more roads shall be provided to the road with the lowest functional classification serving the proposed use of the property.

d. Properties with frontage on two or more roads do not have the right to driveways to all roads.

e. Driveways may be required to be located so as to provide shared driveways and/or cross access driveways with an abutting property or properties.

i. Shared driveways and/or cross access driveways shall be of sufficient width (minimum 20 feet, 6.0 meters) to accommodate two way travel for automobiles and service and loading vehicles. Wider driveways may be required to serve traffic to major generators and/or large vehicles.

ii. Shared driveways, cross access driveways, interconnected parking, and private roads constructed to provide access to properties internal to a subdivision shall be recorded as an easement and shall constitute a covenant running with the land. Operating and maintenance agreements for these facilities shall be recorded with the deed.

2. Driveway Spacing Standards

a. Driveway spacing standards shall apply to driveways located on the same side of a road.

b. Driveway spacing is to be measured along the road from the closest edge or curbline of the driveway pavement to the closest edge or curbline of the next driveway.

c. Driveways shall be located so as to meet or exceed the driveway spacing standards shown in Table 1.

Table 1: Minimum Driveway Spacing Standards

	Development Size in Peak Hour Trips, PHT		
Road Classification	Small 0-150 PHT	Moderate 151-300 PHT	Large ≥300 PHT
Arterial	330 feet	440 feet	550 feet
Collector	220 feet	330 feet	440 feet
Access or Development	60 percent of the minimum frontage requirement		

i. PHT, Peak Hour Trips, will be determined through application of the most current Institute of Transportation Engineers Trip Generation methods and statistics. In general, the determination of Peak Hour Trips is obtained by multiplying the average vehicle trip end rate for the proposed development during the p.m. peak hour of the proposed development or the p.m. peak hour of adjacent road traffic, whichever is greater, times the appropriate multiplier for the development as determined by the type and scale of development. Another methodology or other statistics for determination of Peak Hour Trips may be used with permission from the TOWN Planning Board,.

ii. PHT, Peak Hour Trips, should be based on full build-out of the property.

iii. The larger of the minimum driveway spacing standards for the proposed development or for existing developments at abutting properties will apply. Driveways for in-fill development must meet the driveway spacing standards to abutting properties on both sides.

Driving spacing is one of the fundamental elements of access management. There are four factors which determine generally appropriate driveway spacing: the functional class of the road, traffic speed and volume, and trip generation by the proposed development. Application of all four factors results in a highly complex system of driveway spacing and most states have based driveway spacing standards on speed or a simple combination of speed and functional class (the latter include Florida and Oregon), as shown in Table 2.

Although the standards provided in other states may be simpler to apply than the standards proposed in this Ordinance they do not discriminate between small and large traffic generators and, thus, may penalize small developers or shift land-use "demand" away from areas that are targeted for development. Speed is, nonetheless, a principal determinant of driveway spacing and the standards provided elsewhere are alternatives to the system provided in this Model. Those used in Colorado and Iowa are based on stopping sight distance and provide a particularly good alternative.

Table 2: Comparison of Driveway Spacing Recommendations

Summary of Access Spacing for Various Technical Criteria, in feet (1)

Criteria /// Speed (MPH)	30	35	40	45	50
Stopping Sight Distance	200	250	325	400	475
Sight Distance, Turning	375		460	575	700
Sight Distance, Crossing	290	340	390	440	480
Min. Right Turn Conflict Overlap	100	150	200	300	400
Maximize Egress Capacity	320	450	620	860	1,125

Existing, Proposed or Recommended Driveway Spacing Standards (feet)

State /// Speed (MPH)	30	35	40	45	50
New Jersey	125	150	185	230	275
South Carolina	100	150	200	250	300
Colorado	200	250	325	400	475
Iowa	200	250	325	400	475
Florida	245	245	440	440	660
Oregon	Regional Facilities: Urban 300, Rural 500 District Facilities: Urban 150, Rural 300				

*Source: "*Driveway and Intersection Spacing" Transportation Research Board Circular #456, March 1996, TRB/NRC.

In order to accommodate safe and efficient movement of traffic in balance with the rights of developers this Model Ordinance proposes minimum spacing standards based on the functional class of the road and the size of a proposed development in terms of peak hour trip generation. Larger minimum spacings are provided for higher functional class roads --which have been constructed principally to serve through traffic and are intended to function at higher speeds. Larger spacings are, similarly, required for larger developments --and these are likely to be capable of absorbing large frontage requirements. Conversely, lower minimums have been proposed for lower functional class roads --which are designed principally to accommodate development and often function at lower speeds. Similarly, smaller standards have been set for smaller developments, which are often incapable of absorbing the cost of large frontages. (At the same time, developments which require a small lot but generate a large volume of traffic may be accommodated by combined development or through shared driveways or cross access systems.) To make this type of structure work planners must:

* *ensure that the spacings can be accommodated within existing or proposed frontage requirements along each functional class of road, and*

* *require developers to evaluate how their driveway location will affect opportunities to develop upstream and downstream properties.*

Desirably, minimum frontage requirements (established only through zoning) would meet or exceed the lowest minimum driveway spacing requirement, else in areas that are fully developed the minimum spacing standard might well be unenforceable. In practice, properties in areas that are lightly developed or undeveloped generally have relatively large frontages and are capable of meeting minimum spacing requirements; or, as required in Section V. E., must have an access plan that meets the requirements of the Model Ordinance before a subdivision is approved.

The driveway spacing standards proposed in the Ordinance may be difficult to apply in areas that are heavily developed as lot frontage and existing driveway spacing are generally less than the standards proposed in this Model. Where the spacing of existing driveways is below the proposed minimums, two general approaches are possible:

* *spacing standards can be maintained at relatively high levels and requirements for retrofit can be applied to developed properties,*

* *standards can be based on obtaining the maximum available spacing between existing driveways at developed properties and new driveways at infill properties.*

As a general rule, however, redevelopment provides the best opportunity to improve access management, generally, in highly developed areas. Those localities addressing access management in highly developed areas generally establish a plan which identifies desirable access improvements, and then links implementation of the plan to specific permit actions --such as may be required for redevelopment or a change or upgrade of use at a site.

3. Corner Clearance

   a. Corner clearance is to be measured along the road from the closest edge or curbline of the driveway pavement to the closest edge or curbline of the road pavement.

      Where road widening is planned or anticipated corner clearance should be increased to provide for the width of the additional lane or lanes.

   b. Driveways for corner properties shall meet or exceed the minimum corner clearance requirements, as specified in Table 3:

Corner properties present special problems because they are extremely attractive to high volume peak-hour traffic businesses (e.g. gas stations, mini-marts and fast food franchises) whose designs often create conflict areas that overlap with the conflict area of the intersection. The standards proposed in the Model Ordinance are consistent with those enacted in other states. In practice, however, traffic safety alone would dictate larger spacing. In evaluating site development plans for corner properties Planners should be guided by the following principles:

* *driveways should be located outside the functional area of the intersection or, if this is not possible, driveways should be placed as far as possible from the intersection.*

Table 3: Minimum Corner Clearance Requirements

Type of Driveway, and driveway movements	Partial access: right turns in and/or out only	Full access: all directional movements
Minimum Clearance	110 feet	220 feet

* *driveways which allow left turns in and out should not be allowed where left-turn vehicles must cross three or more lanes or two lanes and a center-left-turn-lane.*

* *cross access should be available to abutting properties.*

4. Driveway Location

a. Driveway location will be based on a site plan which has been approved by the TOWN Planning Board in consultation with the TOWN Engineer and/or the TOWN Highway Superintendent.

b. For the purpose of driveway locations, median openings shall be treated as intersections and driveways to properties opposing a median opening shall be located so as to exceed the minimum corner clearance standards. This requirement shall be waived where the median opening is specifically constructed or reconstructed to provide vehicular access to such properties.

c. Driveways shall be located so as to meet or exceed the minimum driveway spacing standards and the minimum corner clearance standards.

d. The TOWN Planning Board may allow the location of driveways at less than the minimum driveway spacing standards or corner clearance standards, if:

i. a dual-driveway system, cross-access driveway system or shared driveway is proposed and this improves the safe and efficient movement of traffic between the property and the road; or,

ii. a driveway or driveways could be located so as to meet the minimum driveway spacing standards and corner clearance standards, but the characteristics of the property or the physical or operational characteristics of the road are such that a change of location will improve the safe and efficient movement of traffic between the property and the road; or,

iii. conformance with the driveway spacing standards or corner clearance standards imposes undue and exceptional hardship on the property owner.

The safe and efficient movement of traffic along a road and between the road and a development are the dominant considerations in driveway location. Minimum driveway spacing standards are designed to achieve a general reduction in the number and density of driveways along a road. In practice, however, the location of a driveway or driveways at a specific site is affected by many other factors, and these may dictate locations which are less than or exceed the proposed minimum spacing. These might include factors that make it undesirable to place a driveway so as to meet the spacing standards, including sight distance, road grade and geometry, and environmental or historical amenities. They might also include alternative access designs which contribute to the safe and

efficient movement of traffic above and beyond what might be achieved by spacing alone, including development of a dual-drive system or locating a driveway so as to enable the interconnection of abutting or rear properties.

e. For properties unable to meet the minimum driveway spacing standards or corner clearance standards, a temporary driveway may be granted.

The granting of a temporary driveway would normally be conditioned on obtaining access to a planned access road or through a shared driveway, cross-access driveway or unified circulation system with an abutting property, in the future. Specific conditions for closure of the temporary driveway should be attached to the site plan approval, including a target date.

f. For properties unable to meet the minimum corner clearance requirements, driveways shall be located as far as practicable from the intersection. In such cases, driveway movements may be restricted and only one driveway will be permitted along the road frontage not meeting the minimum corner clearance requirement.

5. 5. Driveway Design

a Driveways shall be designed so as to provide for the safe and efficient movement of traffic between the roadway and the site, and to eliminate the potential for the queuing of vehicles along the roadway due to congestion in or at the driveway.

b. Vehicle circulation systems on the site shall be designed so as to provide for the safe and efficient movement of traffic between the driveway and the site.

c. Driveway width, radii, flare, throat length, internal circulation systems, and other design elements for driveways to developments generating more than 150 peak hour trips shall be based upon traffic, engineering and design data provided by a traffic engineer/consultant who is recognized and accepted by the TOWN Planning Board. In the event that a traffic engineer/consultant is not provided the TOWN shall have the right to retain such traffic engineer/consultant at the cost of the applicant.

Inadequate driveway design is commonly implicated in traffic safety problems, often manifested by the development of queues along the road behind a driveway. Appropriate driveway designs vary substantially, however, depending on the scale of development, the volume and type of vehicles using the driveway, site and road conditions, and other factors. The Model Ordinance has opted for a simple approach by providing an objective, defining responsibility, and stating how the appropriate design is to be determined.

More specific approaches are possible. The Florida Department of Transportation Standard Index's design recommendations, for example, shown in Table 4, provide guidelines for driveway width, flare, radii, angle, and divisional islands that can applied to a broad range of situations and are relatively easy to incorporate to an access management ordinance. Virgil Stover has provided similar guidance for connection depths, throat length, as shown in Table 5. (Additional assistance in establishing

appropriate driveway designs can also generally be provided by the County Highway Department and the Traffic and Safety Division of the New York State Department of Transportation.)

Table 4: Suggested Access Connection Design
FLADOT, Standard Index, Roadway and Design Standards, 1992

Trips per Day / Trips per Hour	1 - 20 / 1 - 5		21 - 600 / 6 - 60		601 - 4,000 / 61 - 400	
	Urban Section	Rural Section	Urban Section	Rural Section	Urban Section	Rural Section
Connection Width (two-way)	12' min 24' max	12' min 24' max	24' min 36' max	24' min 36' max	24' min 36' max	24' min 36' max
Flare (Curb Drop)	10' min	N/A	10' min	N/A	N/A	N/A
Returns (Radius)	N/A	15' min 25' std 50 max	small radii may be used	25' min 50 std 75 max	25' min 50' std 75' max	25' min 50' std 75' max
Angle of Drive			60° - 90°	60° - 90°	60° - 90°	60° - 90°
Divisional Island			4' - 22'	4' - 22'	4' - 22'	4' - 22'

Table 5: Generally Adequate Connections Depths for Major Facilities

Facility Type	Depth (feet)
Regional Shopping Centers (malls)	250
Community Shopping Center	80
Small Strip Shopping Center	30
Regional Office Complex	250
Office Center	80
Smaller Commercial Developments	30

6. Driveway Movements

   a. Driveway movements (cross, left turn in, left turn out, right turn in, and right turn out) may be restricted so as to provide for the safe and efficient movement of traffic between the road and the property.

   b. Each driveway is to be designed and constructed to provide only the allowable movements and physically discourage prohibited movements.

7. Interconnection of Parking Areas

a. Adjacent properties may be required to provide a cross access driveway and pedestrian access to facilitate circulation between sites.

b. Shared parking is encouraged. Shared parking shall be permitted a reduction in required parking spaces if peak parking demand periods at interconnected developments do not occur at the same time.

c. On site vehicular circulation systems shall be designed so as to facilitate use of cross access driveways.

d. Cross access driveways shall be recorded as an easement and shall constitute a covenant running with the land. Operating and maintenance agreements for these facilities shall be recorded with the deed.

B. Intersection Spacing

1. Intersection spacing shall be measured from the centerline of the proposed connecting roadway to the centerline of the next connecting roadway or to the centerline of a signalized driveway, whichever is closest.

2. Minimum intersection spacing standards are established so as to provide for the efficient movement of traffic. Minimum intersection spacing shall be as set out in Table 6:

Table 6: Minimum Intersection Spacing Standards

Road Type	Signalized Intersection	Unsignalized Intersection
Major Traffic Road	2,640 feet	1,320 feet
Collector Road	2,640 feet	1,320 feet
Development Road	1,320 feet	660 feet

Large minimum intersection spacing standards contribute primarily to the efficient flow of traffic and reduce travel time. The minimums proposed in this Model Ordinance also reflects the need to provide safe and expeditious access to properties abutting public roads.

3. Maximum intersection spacing standards are provided to ensure an orderly pattern of land-use development and the creation of a safe and efficient traffic circulation system serving development.

a) The establishment of intersections at locations at less than the maximum spacing standard shall be applied as an element of the site plan review process, or as part of the subdivision approval process, or prior to subdivision or site plan approval on the TOWN/COUNTY official map.

b) Maximum intersection spacing shall be as set out in Table 7:

Table 7: Maximum Intersection Spacing Standards	
Road Type	**Approximate Spacing**
Arterial	5,280 feet
Collector	2,640 feet
Access and Development	1,320 feet

An efficient road network provides for both efficient traffic circulation and development. Ideally, the development of a local road network would evolve from the transportation element of a local Comprehensive Plan: which identifies the location of roads and intersections, the functional purpose of each road to be developed, and the circumstances or phasing under which such roads or intersections would actually be built. All too often, however, residential and commercial development preempts such plans and displaces the logical location of roads and intersections. The results of such displacement can be unfortunate and may include land-locked properties and overly expensive fixes to local traffic circulation and safety problems. Maximum intersection standards can be applied (even in the absence of a local transportation plan) to guide the development of a logical and efficient local road network.

C. Medians and Median Openings

1. The type, location and length of medians on public roads shall be determined by the entity having jurisdiction over such roads. This determination will be made in consultation with the TOWN Planning Board and will be based on existing and projected traffic conditions; the type, size, and extent of development and traffic generated by development; traffic control needs; and other factors.

2. The minimum spacing between median openings shall be as shown in Table 8:

Table 8: Minimum Median Opening Spacing Standards		
Type of Median opening // Posted Speed	Restrictive, does not allow all directional movements	Non-Restrictive, allows all directional movements
Less than 45 MPH	660 feet	1,320 feet
45 MPH or more	1,320 feet	2,640 feet

3. Median openings intended to serve development must meet or exceed the minimum median opening spacing standards and must also be justified by a traffic impact analysis approved by the entity having jurisdiction over such roads, in consultation with the TOWN Planning Board, or the TOWN Planning Board where driveways are proposed to connect to TOWN roads. The cost for preparation of the traffic impact analysis and construction of the median opening or openings, including installation and operation of signals and other improvements where warranted, shall be born by the applicant.

D. Large Developments

1. Large Developments are developments which generate more than 300 Peak Hour Trips. For purposes of this subsection Large Developments shall include residential and mixed

used subdivisions whose combined trip generation from all properties exceeds 150 Peak Hour Trips and such other uses as will, in the opinion of a qualified transportation engineer, detrimentally impact the safe and efficient movement of traffic.

2. Large developments shall be required to mitigate the traffic impacts of their development. Required mitigation may include but is not limited to the construction of signals, turning lanes, medians, combined and shared driveways, and service or access roads as well as implementation of transit improvements and/or traffic demand management strategies.

3. Required mitigation will be established by the TOWN Planning Board through a SEQRA review and/or Transportation Impact Study (TIS) as determined by the TOWN Planning Board.

4. It shall be the developer's responsibility to provide the SEQRA review or Transportation Impact Study, as directed by the Town Planning Board.

5. It shall be the developer's responsibility to provide the required mitigation.

6. Phased mitigation may be allowed where phased development is proposed.

Individual small- to moderate-sized developments seldom generate traffic impacts which warrant immediate mitigation. Over time, however, the cumulative impacts of such developments place tremendous stress on the transportation environment, and often inhibit solutions to relieve this stress. By-and-large, this Model Ordinance addresses cumulative development.

Large developments, however, require specific and individual attention because their traffic demands, alone, may actually exceed the capacity of some road local road systems but often reduce the level of service --even on major roads. The Model Ordinance simply reinforces existing practices in many municipalities by requiring that such developments evaluate and mitigate any impacts that they may cause.

E. Subdivisions

1. Planned access shall be provided for properties which are the result of subdivisions occurring after the effective date of this Ordinance.

2. Planned access shall address the provisions of this Ordinance, other State and Local requirements, and the following:

   i. Properties which are the result of a subdivision do not have the right of individual and exclusive access to State and local roads. The number of driveways or other connections shall be the minimum number necessary to provide reasonable access to these properties, not the maximum available for the frontage.

   ii. Access shall be provided to the road with the lowest functional classification serving the proposed development.

iii. Access should be internalized. Access to properties within a subdivision should be obtained from an access road or interior road.

iv. If the property which is proposed to be subdivided has frontage on two or more roads, internal properties should share access to such roads.

v. The access system for the proposed subdivision should be coordinated with existing, proposed and planned streets outside the subdivision.

3. Shared driveways, cross access driveways, interconnected parking, and private roads constructed to provide access to properties internal to a subdivision shall be recorded as an easement and shall constitute a covenant running with the land. Operating and maintenance agreements for these facilities should be recorded with the deed.

In lightly to moderately developed areas property sizes are likely to be large and, hence, property owners may be attracted to subdivide their properties in order to maximize real estate income. Planned access as a requirement for subdivision approval is one of the best methods of reducing the impacts of subdivision traffic on the local road system while ensuring orderly development. Three general principles should guide the development of subdivision access plans:

* *reduce the number of direct connections to higher functional class roads (perhaps collectors but certainly arterials) by providing internal roads and requiring driveways to these roads;*

* *where potential subdivisions abut 2 or more roads, distribute traffic by requiring connections to all roads and developing a circulation system that provide all properties with reasonable access to such roads; and,*

* *where potential subdivisions abut other undeveloped properties provide easements linking the internal circulation system to the abutting property. This allows for the connection of "future" roads (or parking areas).*

F. Changes in Access

1. Conditional Requirements. For developments taking place after the effective date of this Ordinance:

a. The TOWN Planning Board may establish provisions for and require future alteration of the property layout, the location and design of driveways, parking, and other access features based on phased development, additional development or a change in use of a property, or development of or a change in use at an abutting property.

b. On completion of a side, access or service road abutting a property with a driveway connection to a Major Traffic Road, the TOWN Planning Board may

require a driveway or driveways to the side, access or service road and closure of the driveway connection to the Major Traffic Road.

The TOWN Planning Board may waive this requirement if:

i. the property shares a driveway or dual-driveway system to the Major Traffic Road with an adjacent property or properties; and/or

ii. driveway movements from the driveway to the Major Traffic Road are restricted or the TOWN Planning Board determines that road improvements are warranted and the property owner agrees to construct such improvements.

c. For any change or upgrade of use of a property which requires a TOWN permit or approval and increases Peak Hour Trips, the TOWN Planning Board may:

i. require the closure and relocation or consolidation of driveways so as to meet the minimum driveway spacing standard for the new level of Peak Hour Trips;

ii. require shared driveways and cross-access driveways with abutting properties; and,

iii. impose property-layout and parking requirements which allow for the circulation of traffic between abutting properties.

The Model Ordinance contains requirements that may not be immediately necessary but will be desirable and may be necessary once development approaches full build-out. The short-term costs of such requirements may be difficult to justify in respect to immediate benefits and may actually inhibit development. To get around such problems the Model Ordinance enables local governments to incorporate provisional requirements, generally to the site-plan approval. These changes would then be implemented once certain threshold conditions occur; for example, once traffic volumes reach a certain level, or development occurs at an abutting site, or a rear access or service road is constructed.

2. Non-Conforming Access

a. When a property owner of a property with an existing, non-conforming driveway or driveways, as of the effective date of this Ordinance, applies for a permit to upgrade or change the use of the property, the TOWN Planning Board will determine whether it is necessary and appropriate to retrofit the existing driveway or driveways.

b. The property owner may be required to establish a retrofit plan. The objectives of the retrofit plan will be to minimize the traffic and safety impacts of development by bringing the number, spacing, location, and design of driveways into conformance with the standards and requirements of this Ordinance, to the

extent possible without imposing undue or inequitable hardship on the property owner. The retrofit plan may include:

i. elimination of driveways,

ii. realignment or relocation of driveways,

iii. provision of shared driveways and/or cross access driveways,

iv. reversal of access (e.g. installation of a driveway to a rear access road),

v. restriction of vehicle movements (e.g. elimination of left turns in and out),

vi relocation of parking,

vii. traffic demand management (e.g. a reduction in peak hour trips),

viii. signalization, or

ix. such other changes as may enhance traffic safety.

b. The requirements of the retrofit plan will be incorporated as conditions to the permit for the change or upgrade of use and the property owner will be responsible for the retrofit.

As noted in the Introduction the Model Ordinance generally applies in lightly to moderately developed areas. Pre-existing developments within these areas almost always have access features which are inconsistent with the requirements of the Model. It is generally unreasonable and difficult to impose immediate and potentially expensive access retrofits on such developments --unless that is the specific intent of an access management plan which has been implemented by popular mandate. The Model resolves this problem by authorizing the Planning Board to work with the property owner or developer to identify and implement (or require) necessary access changes. Four potential triggers are generally possible:

* *when the property owner or developer applies for a permit to enlarge, upgrade or change the property use;*

* *when the property owner or developer applies for a new access or highway permit;*

* *when an abutting property is developed or changes in use and the property owner or developer of the abutting property wishes or is willing to share a driveway and/or interconnect parking areas; and*

* *when a service or access road is constructed or the front road is reconstructed.*

G. Incentives

1. In order to ensure the safe and efficient movement of traffic along a road and between the road and properties abutting the road, shared driveways, cross access driveways, access and service roads, internal circulation systems, and interconnected parking are encouraged.

2. The TOWN Planning Board may grant a property owner adjustments to the permissible bulk, area and coverage requirements including setbacks, density, area, height, or open space otherwise required in the zoning district when such property owner elects to provide and maintain shared driveways, cross access driveways, access and service roads, internal circulation systems, or interconnected parking.

3. The TOWN Planning Board reserves the authority to determine, in its discretion, the adequacy of the access management amenities to be accepted and the particular bonus or incentive to be provided to a property owner.

H. Variance Standards

1. The granting of a variance shall be in harmony with the purpose and intent of this Ordinance and shall not be considered until every reasonable option for meeting the provisions of this Ordinance is explored or unless the variance is in the public interest.

2. Applicants for a variance must provide proof of unique or special conditions that make strict application of the provisions of this Ordinance impractical. This shall include proof that:

   i. indirect or restricted access cannot be obtained; and,

   ii. no reasonable engineering or construction solution can be applied to mitigate the condition; and,

   iii. no reasonable alternative access is available from a road with a lower functional classification than the primary road; or**,**

   iv. the variance is in the public interest.

3. Under no circumstances shall a variance be granted unless not granting the variance would deny all reasonable access, endanger public health, welfare or safety, or cause an exceptional and undue hardship on the applicant. No variance shall be granted where such hardship is self-created.

SAMPLE NATIONAL REGULATION GUIDES FROM CENTER FOR URBAN TRANSPORTATION RESEARCH (CUTR)

Subdivisions

1. Subdivisions with frontage on the state highway system shall be designed into shared access points to and from the highway. Normally a maximum of two accesses shall be allowed regardless of the number of lots or businesses served.
2. The street system of a proposed subdivision shall be designed to coordinate with existing, proposed, and planned streets outside of the subdivision as provided in this Section.
3. Wherever a proposed development abuts unplatted land or a future development phase of the same development, street stubs shall be provided as deemed necessary by the *(town/city/village/county)* to provide access to abutting properties or to logically extend the street system into the surrounding area.
4. All street stubs shall be provided with temporary turn-around or cul-de-sacs unless specifically exempted by the _____, and the restoration and extension of the street shall be the responsibility of any future developer of the abutting land.
5. Collector streets shall intersect with collector or arterial streets at safe and convenient locations.
6. Subcollector and local residential access streets shall connect with surrounding streets to permit the convenient movement of traffic between residential neighborhoods or facilitate emergency access and evacuation, but such connections shall not be permitted where the effect would be to encourage the use of such streets by substantial through traffic.
7. When a residential subdivision is proposed that would abut an arterial, it shall be designed to provide through lots along the arterial with access from a frontage road or interior local road (see Figure 10). Access rights of these lots to the arterial shall be dedicated to the *(city/county)* and recorded with the deed. A berm or buffer yard may be required at the rear of through lots to buffer residences from traffic on the arterial. The berm or buffer yard shall not be located within the public right-of-way.

Joint Access

1. Adjacent commercial or office properties classified as major traffic generators (i.e. shopping plazas, office parks, etc.) shall provide a cross access drive and pedestrian access to allow circulation between sites.
2. A system of joint use driveways and cross access easements as shown in Figure __ shall be established wherever feasible along _____ and the building site shall incorporate the following:

a. A continuous service drive or cross access corridor extending the entire length of each block served to provide for driveway separation consistent with the access management classification system and standards;
b. A design speed of __ mph and sufficient width to accommodate two-way travel aisles designed to accommodate automobiles, service vehicles, and loading vehicles;
c. Stub-outs and other design features to make it visually obvious that the abutting properties may be tied in to provide cross-access via a service drive; and
d. A unified access and circulation system plan that includes coordinated or shared parking areas is encouraged wherever feasible.

3. Shared parking areas shall be permitted a reduction in required parking spaces if peak demand periods for proposed land uses do not occur at the same time periods.

Corridor Overlay Zones

Overlay zones are a growing method for managing access along commercial corridors. The technique is used to overlay a special set of requirements onto an existing zoning district, while retaining the underlying zoning and its associated requirements. Text that specifies standards for the access management overlay district is included in the land development (or zoning) code and then corridors are designated on the zoning map. Overlay requirements may address any issues of concern, such as joint access, parking lot cross access, reverse frontage, driveway spacing, and limitations on new driveways.

1. The minimum lot frontage for all parcels with frontage on (*name affected segments of thoroughfares here or refer to a list)* shall not be less than the minimum connection spacing standards of that thoroughfare, except as otherwise provided in this Section. Flag lots shall not be permitted direct access to the thoroughfare and interior parcels shall be required to obtain access via a public or private access road in accordance with the requirements of this Code.
2. The following requirements shall apply to segments of designated thoroughfares that are planned for commercial or intensive development. All land in a parcel having a single tax code number, as of (*date of adoption*), fronting on (*define segment of affected thoroughfare or refer to a Table defining affected segments*), shall be entitled one (1) driveway/connection per parcel as of right on said public thoroughfare(s). When subsequently subdivided, either as metes and bounds parcels or as a recorded plat, parcels designated herein shall provide access to all newly created lots via the permitted access connection. This may be achieved through subdivision roads, joint and cross access, service drives, and other reasonable means of ingress and egress in accordance with the requirements of this Code. The following standards shall also apply:

a. Parcels with large frontages may be permitted additional driveways at the time of adoption of these requirements provided they are consistent with the applicable driveway spacing standards.
b. Existing parcels with frontage less than the minimum connection spacing for that corridor may not be permitted a direct connection to the thoroughfare under this Section where the Planning Commission/Board determines alternative reasonable access is available to the site. [**Note**: The Planning Commission/Board could allow for a temporary driveway as provided in Section 7 with the stipulation that joint and cross access be established as adjacent properties develop.]
c. Additional access connections may be allowed where the property owner demonstrates that safety and efficiency of travel on the thoroughfare will be improved by providing more than one access to the site.
d. No parking or structure other than signs shall be permitted within (10- 50) feet of the roadway right-of-way. The (10-50) foot buffer shall be landscaped with plants suitable to the soil and in a manner that provides adequate sight visibility for vehicles exiting the site. Property owners shall be permitted to landscape the right-of-way, pursuant to an approved landscaping plan.
e. Permitted connections shall be identified on a map that shall be adopted by reference and that portion of a corridor affected by these overlay requirements shall be delineated on the (town/city/village/county) zoning map with hatch marks.

ACCESS MANAGEMENT STATUE PROTOTYPES AND REGULATORY ELEMENTS

Appendix C

Access Management Statute Prototypes and Regulatory Elements

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This paper was prepared to assist state highway agencies in developing language for statutes and determining the content of regulations. It does not attempt to discuss the merits of the statutory language provided, nor does it offer specific recommendations.

The first section presents a collection of paragraphs that can be used in statutes and, with revisions, in rules. The second section does not contain complete paragraphs for regulations, but a listing of issues and elements common to access regulations. Complete sample regulatory language can be obtained by collecting actual rules from selected states. At this time, modern rules are known to be available from Colorado, New Jersey, Florida, Maine, and Oregon.

There are many legal issues and opinions surrounding these paragraphs and topics. However, there are many good sources that discuss the legal issues of access rights and management. Because this area of law has many variations, at least two sources or opinions should be cited for each topic.

As with any legislation, the relationship between the legislative and the executive branches as defined by both law and prevailing attitudes will determine statute content to a great degree. A very important decision will be which of the following prototype paragraphs address issues appropriate for statute and which would be better suited for a regulation. Some legislatures will choose to minimize the statutory language and give broad regulatory powers and discretion to the executive branch. Others will choose to more tightly direct and manage the executive powers by providing a lengthy and detailed statute, or very limited powers. The reasons for either option are varied.

This paper borrows from the laws and regulations of Colorado, New Jersey, Florida, and Oregon, because these states have established modern and comprehensive access management programs. Since the paragraphs were edited to some degree, references, unless specific, are not shown. Colorado's regulation was chosen as a base model for the regulation elements, because it is recognized as the oldest, modern comprehensive access management regulation. Its statutes and regulations have proven effective for more than 20 years.

Through the several samples provided, the reader should see choices as well as gain an understanding of how some of the differences will affect overall policy. Some of these ideas may not fit an individual state. As always, attorneys should be consulted in all matters of law and policy.

STATUTORY PROTOTYPES

Statements of Basis, Findings, and Purpose

Many states require that new legislation mention the basis, findings, and purpose of each new section in a preamble of the law. The following paragraphs are offered on the public purposes of access management:

> The state highway system serves as a network of primary and secondary arterial routes for the safe and efficient movement of people and goods. It was constructed and is maintained at great public expense and constitutes irreplaceable public assets. The state has a public trust responsibility to manage and maintain effectively each highway within the state system to preserve its functional integrity and public purpose for present and future generations.
>
> The efficiency and safety of a highway depend to a large extent upon the amount and character of roadside interference with through traffic. Most interference originates in vehicular movements to and from connecting streets, businesses, residences, and other developments along the highway. Accordingly, regulations to control access points are necessary to provide efficient and safe operation on the highway and to obtain the optimum use of highway investments. Although owners of land have certain rights of access, highway users have certain rights to safe and efficient travel. These competing interests shall be considered in the access regulations and in the access permit process consistent with constitutional, statutory, and case law.
>
> The lack of adequate access management of the highway system and the proliferation of driveway and other direct accesses to the state highway system are major contributors to highway accidents and have been the greatest factors behind the functional deterioration of highways in the state. As new accesses are constructed and traffic signals erected, the speed and capacity of the highway decrease, and congestion and hazards to the traveling motorist increase. The establishment of a sound access management regulation enhances the development of an effective transportation system and serves to increase the traffic-carrying capacity of the state highway system. It also serves to reduce traffic accidents, personal injury, property damage, and highway maintenance costs and lengthen the effective life of transportation facilities.
>
> Mobility is the key to economic well being and to growth. Poor access management reduces highway capacity and increases vehicle conflicts, which leads to congestion and to accidents. If mobility is to be maintained, effective access management must be implemented as an important element in the economic growth plan of any region or state.
>
> Regulation of access to the public system of highways, roads, and streets is necessary to protect the public health, safety, and welfare; to preserve the functional integrity of the public roadways; and to promote the safe and efficient movement of people and goods within the state. In furtherance of these purposes, the Legislature finds and declares that:
>
> 1. The existing public system of highways, roads, and streets was constructed and is maintained at great public expense and constitutes an irreplaceable public asset;
> 2. Land development activities and unrestricted access to public ways can impair the purpose of the public highway system and damage the public investment in that system;
> 3. Every owner of property that abuts a public road has a right of reasonable access to the general system of streets, roads, and highways in the state, but not to a particular means or location of access; and
> 4. The access rights of an owner of property abutting a state highway must be held subordinate to the public's right and interest in a safe and efficient highway.

For language efficiency, the findings and authority can be combined if only a short law is desired. It depends in part on the amount of legislative intent desired to be shown in the legislation and the scope of authority given to the

executive branch. In 2000, the South Dakota legislature only used one paragraph to instruct its DOT:

> 11-3-12.2 Promulgation of rules for approval of access to state highways. The Transportation Commission may adopt rules, pursuant to Chapter 1-26, governing the following elements in granting written approval for access to state highways as provided for in 11-3-12.1 and 31-24-6:
>
> 1. Access location, width, and spacing;
> 2. Signal spacing;
> 3. Median design;
> 4. Access application process;
> 5. Access construction standards; and
> 6. Safety.
>
> Nothing in the rules promulgated pursuant to this section supersedes county or municipal planning and zoning authority.

This next paragraph combines granting authority and purpose:

> The state department of transportation and local governments are authorized to regulate vehicular access to or from any public highway under their respective jurisdiction from or to property adjoining a public highway to protect the public health, safety, and welfare; to maintain smooth, efficient, and safe traffic flow; to maintain highway right-of-way drainage; and to protect the functional integrity and public purpose of highways and the public investment in the transportation system.

Authority to Establish Fair and Uniform Regulations

Establishing access management regulations requires statutory authority from the state legislature. This statutory authority is critical to the success of the program. The following is a sample paragraph for establishing this authority:

> The state department of transportation shall adopt within two years a state highway access code, by rule and regulation, for the implementation of this section. The access code shall address the design and location of driveways and other points of access to public highways. The access code shall be consistent with the authority granted in this section and shall be based upon consideration of existing and projected traffic volumes, the functional purposes of public highways, adopted transportation plans and needs, local and regional drainage requirements, the character of lands adjoining the highway, adopted land use plans and zoning, the type and volume of traffic to use the access, other operational aspects of the access, the availability of vehicular access from local streets and roads rather than from a state highway, and the state highway system's ability to provide for the safe and efficient movement of people and goods within the state.
>
> The access code shall include, but not be limited to, access location standards, safety factors, design and construction standards, related traffic control standards, application requirements, administrative procedures, and standards for access maintenance.

Direct Highway Access

The majority of states appear to hold that the right of reasonable access does not include the right of direct highway access. Some states hold that direct access to each and every abutting public roadway is a property right—so-called abutters' rights. In most states this issue has been defined by 200 years of case law. When states consider new legislation, this issue can be defined by statute.

Direct access to each abutting street should not be considered a property right. Direct access is not a constitutional right. However, some states have chosen to put such rights into statute, or these rights have been defined by case law. This makes it more difficult to regulate design and safety. There is a property right of reasonable access to the public street system to make reasonable use of the property. The following two sample paragraphs manage the right to access:

> Private property is entitled to reasonable access to the general street system. Private property is not entitled to access to each abutting street. The provisions of this section shall not be deemed to deny reasonable access to the general street system.
>
> For the purposes of this section, alternative access shall be assumed to exist if the property enjoys reasonable access, or if

> access is available, onto any parallel or perpendicular street, highway, easement, service road, or common access, that is of sufficient design to support traffic to the allowable, current, or proposed use and is so situated that motorists will have a reasonable and safe means of both reaching the property and returning to the highway.

Condemnation Powers

Depending in part on the scope of the existing highway agency's condemnation powers, it may be necessary or desirable to specifically include condemnation for access rights, as in the next sample paragraph. Many states already addressed this issue to some degree during development of the access-controlled Interstate system.

> In addition to any powers granted to the department of transportation under this section or any other provision of law, the department may acquire, by purchase or condemnation, any right of access to any highway upon a determination that the public health, safety, and welfare require it.

Permit Requirement

A permit should be required for any access construction or modification, as the following text establishes:

> As of the date of this act, no person or entity shall construct a new access or reconstruct, relocate, or modify any existing access approach, to or from a state highway, without a permit issued in accordance with rules adopted by the department of transportation. The construction of the access and its appurtenances as required by the terms and conditions of the permit shall be completed at the expense of the permittee, except as provided in Subsection 7. Access permits shall be issued only in compliance with the access code and may include terms and conditions authorized by the access code and other applicable state laws as required (historical, archaeological, endangered flora and fauna, drainage districts, hazardous materials, etc.). All materials used in the construction of the access within the highway right-of-way become the property of the department of transportation. Where required roadway improvements require new rights-of-way, the permittee shall provide sufficient dedication to the state or local government.
>
> Permits issued between the date of this act and the effective date of the regulation shall be issued consistent with current permit procedures and available standards.
>
> After the effective date of this legislation, no person or other entity shall construct or modify any access providing vehicular egress and ingress to or from any state highway from or to land and property adjoining a state highway without first obtaining an access permit approved by the department of transportation. The department may issue a permit subject to any reasonable conditions necessary to carry out the provisions of this section and the access code. Nothing in this subsection limits the department's authority to restrict the operational characteristics of a particular means of access. The department has the authority to restrict or deny access to the state highway system in accordance with the provisions of this act.
>
> The department may issue a nonconforming access permit after finding that to deny an access permit would leave the property without a reasonable means of access to the general street system. The permit may specify limits on the maximum vehicular use of the access and include conditions regarding the availability of future alternative means of access that would bring the permit into conformance.

Permit and Application Fees

Some states use application fees, permit fees, or a schedule of fees depending on the extent of review, inspection, and time used by the agency. Authority to exact fees can be established as follows:

> The commission shall establish a graduated schedule of fees for permit applications made to the department of transportation. Such fees shall be nonrefundable and shall be used to offset the costs of administering the access permit review process and the costs associated with administering the provisions of this act. In no event shall a permit fee be more than [specify a monetary limit].
>
> Local access permit-issuing authorities may establish a reasonable schedule of fees for access applications, for permits issued, and for inspections, which fees shall not

exceed the costs of administration of access permits.

A reasonable schedule of fees may be established for applications received and permits issued pursuant to the access code and this section, which fees shall not exceed the costs of the administration of the access code.

Timely Decisions

The department of transportation's decisions on applications should be timely, and this stipulation may also be included in the legislation:

> The code shall include a provision providing for a period of time for the renewal, issuance, modification, or denial of these permits, not to exceed 100 days from the date of receipt of the completed application for a major access permit and not to exceed 50 days from the date of receipt of the completed application for a minor access permit. If the permitting authority fails to act within the allotted time after a complete application for access permit has been properly submitted, such permit shall be deemed issued, subject to engineering, design, and safety standards of the department of transportation.

Delegating Authority to Issue Permits

The state may delegate the authority to issue permits to local authorities, as follows:

> Upon written request by a local authority, the department of transportation may, in whole or in part, delegate permit-issuing authority for state highways to the local authority, provided permits issued are in compliance with the state highway access code and provided all such permits each have the written concurrence of the department of transportation.

Permit Expiration

Legislators may also limit the life of the permit in a number of ways, as shown by the following example:

> All permits issued pursuant to this section shall automatically expire and become invalid if the access is not under construction within 1 year after the issuance of the permit, unless the department prior to expiration and in writing extends the date of expiration, not to exceed 1 year, for good cause upon its own initiative or upon the request of a permittee. All construction work within the right-of-way shall be completed in an expedient manner and should not exceed 45 days. The department may set as a term in the permit the amount of time allowed for construction on the basis of standard construction practices and may restrict construction periods and methods as necessary to protect public safety and maintain roadway operations.

Handling Violations and Enforcement

There are several types of violations: the construction of an access without permission (illegal), the violation of the terms and conditions of an issued legal permit, or the violation (increase) of the historical use of a grandfathered access location. The next paragraphs provide samples of legislation for these eventualities.

Permit Violations

When a permitted access is constructed or utilized in violation of the access code, permit terms and conditions, or this section, either the local authority or the department of transportation or both may obtain a court order enjoining violation of the access code, permit terms and conditions, or this section.

Such access permits may be revoked by the issuing authority if, at any time, the permitted access and its use fail to meet the requirements of the access code, the terms and conditions of the permit, or this section, or if the applicant fails to comply with the conditions upon which the issuance of the permit was predicated, or the applicant filed improper, misleading, or untruthful information in the application process.

When a permitted access is constructed or utilized in violation of the regulations, permit terms and conditions, or this section, the issuing authority or department may obtain a court order enjoining violation of the access code, permit terms and conditions, or this section, or the issuing authority or department may suspend, restrict, or revoke the permit in accordance with licensing procedures pursuant to the state administrative procedures act.

The department, or issuing authority, may summarily suspend an access permit

and immediately order closure of the access when its continued use presents an immediate threat to public health, welfare, and safety.

Illegal Access

The department of transportation, or local authority with department of transportation authorization, may install barriers across or remove any driveway or other access providing direct access to a state highway that is established without an access permit.

The department may initiate injunctive proceedings as provided in Section [ ] to enforce the provisions of this section or any rule or order issued or entered pursuant thereto.

Subdivision Decisions Consistent with Access Law

This next section provides for the access of new subdivisions and would also be placed in subdivision law:

> After the effective date of this legislation, no person may submit, or local authority approve, an application for subdivision of property abutting a state highway unless the subdivision plan or plat provides that all lots and parcels created by the subdivision will have access to the general street system in conformance with the purposes and standards of this section and the state highway access code. All subdivisions that affect the state highway system shall be reviewed by the state for conformance with access management requirements.

Changes in Access

The following section provides for changes in access to conform to the access code or as part of public improvement projects:

Changes in Access Use by Permittee and Access Changes Required by Public Improvement Projects

Any access, whether constructed before, on, or after the effective date of this statute, may be required by the state department of transportation to be reconstructed, relocated, or closed as necessary to bring the access into conformance with the access code, either at the property owner's expense if the reconstruction, relocation, or closure is necessitated by a change in the use of the property that results in a change in the type of access operation, or at the expense of the state department of transportation if the reconstruction, relocation, or closure is necessitated by changes in road or traffic conditions. The necessity for the relocation, reconstruction, or closure shall be determined by reference to the standards set forth in the access code.

When changes in access are necessary due to changes in highway or traffic conditions, the department shall provide to the affected property owner and lessee or lessees, at least 60 days prior to any hearing, a plan depicting how such access would be obtained after the reconstruction, relocation, or closure of the current permit, and the improvements, if any, that will be provided by the department to secure the alternative means of access. A copy of the plan shall also be filed with the local authority.

Existing Legal Access at Time of Legislation

Allowances should be made for legal access that may become nonconforming under new law. The most frequent management problem with older accesses is the determination of their historical use at the time of the new legislation. However, given the public safety impacts of older access points, highway agencies still need authority to manage these grandfathered accesses:

> Legal access in existence on the effective date of this section shall be considered grandfathered according to its actual established historical vehicular volumes, type of vehicle, and use, unless specifically stated otherwise in this section. Access constructed between the effective date of this section and the effective date of the access code shall comply with any current access standards, the department's engineering judgment, and this section.

Appeals and Rights of Due Process

All states have a general administrative procedures statute not unlike the federal Administrative Procedures Act. These procedures provide for hearings, citizen grievances, and access to the judicial system to protect the citizen from improper agency actions, and this can be incorporated in the legislation as follows:

Anyone receiving an adverse decision by the department, after having made proper permit application as required by the rules, may request and shall receive a hearing in accordance with procedures set by the rules and pursuant with the state Administrative Procedures Act. The reconstruction, relocation, or closure of a legal access shall be administered in the same manner as the modification or revocation of a license under the state administrative procedures act.

Requests must be made within 60 days from the department's final decision. Decisions by the administrative law judge may be appealed by either party.

An applicant who has received an adverse decision may, within 10 days after the receipt of notification of such decision, request a meeting with department personnel to determine whether any means exist by which the reasons for the decision may be mitigated. Upon the timely receipt of a written request for such meeting, the appropriate department personnel shall meet with the applicant to attempt such mitigation. Such request or the failure to make such request, any statements made during such meeting, and the results of such meeting shall not be admissible in any subsequent judicial or administrative proceeding regarding the adverse decision.

Authorizations for Local Government

State-level authorizations provide local governments with clear authority to pass local ordinances:

Counties and municipalities may adopt the department rules, by reference in whole or in part, or may adopt separate provisions for application to local roadways under their jurisdiction.

The department will, in cooperation with local authorities, develop and maintain a model access code for counties and municipalities. The model shall address all levels of local public ways and provide access design, location, and management criteria.

The boards of county commissioners may, by resolution, and municipalities may, in the manner prescribed in Article [ ] of title [ ] adopt by reference the state highway access code, in whole or in part, or may adopt the model access code, or may adopt separate provisions, for application to local roads and streets that are not part of the state highway system.

Access Management Plans

The legislation can mandate the parameters for formulating access management plans, including mandating the parties to be involved in their formulation and the process by which they are created and approved:

Either the department or the appropriate local authority may, at its discretion, adopt an access management plan for a designated portion of public highway under its jurisdiction. The access management plan shall provide a comprehensive roadway access location and design plan for the purpose of achieving the functional and safety needs to the extent feasible given existing and planned conditions. The plan should achieve the optimum balance between transportation planning objectives and land development plans and preserve and support the current and future functional integrity of the highway system. If the plan involves a state highway, the department will be a party to the plan. Any governmental entity with land use authority within the plan area shall be a party to the plan. Any plan involving more than one governmental entity shall be adopted by interagency agreement among the parties.

An access management plan shall indicate existing and future access locations and all major access-related roadway access design elements, including traffic signals, that are to be modified and reconstructed, relocated, removed, added, or will remain. Prior to completing the agreement on an access management plan, it shall be determined that: (1) the access plan conditions are within the authority of the parties to the plan, (2) the access plan complies with or exceeds the access standards established in any adopted access codes and local laws, (3) the access plan is in reasonable consistency with any assigned access category, and (4) an appropriate means of access has been identified for every existing lot currently having frontage on the highway segment.

At least one advertised public meeting shall be held during the development phase of the plan. All property owners on record

abutting the highway within the plan limits shall be notified directly of the proposed plan and afforded the opportunity to submit any information, data, and agreements regarding the proposed plan.

After an access management plan is in effect, modifications to the plan must receive the approval of the local authority and, if on a state highway, of the department. Where an access management plan is in effect, all action taken in regard to access shall be in conformance with the plan.

Establish an Access Classification Schedule

The legislation can mandate the state department of transportation to maintain and make public an access classification schedule, in the following manner:

The state department of transportation shall maintain an access classification schedule, by rule and regulation, that defines each state highway according to its purposes in the statewide highway transportation system. The department shall determine the access classification of all state highways. The access classification of county roads and municipal streets may be determined by the appropriate local authority.

The access code shall contain an access category system that establishes a hierarchical set of categories that have criteria that establish the degree of access control according to highway function. The classification system shall be based upon the following criteria:

1. The function that segments of state highway serve and are planned to serve within the state highway system and within the general system of streets and highways;
2. The environment within which highways are located, including but not limited to urban and rural environments;
3. The appropriate and desirable balance between facilitating safe and convenient movement of through traffic and providing access to abutting property;
4. The desirable travel speeds and the degree to which through traffic should be protected from delays;
5. The warrants for access auxiliary turn lanes; and
6. The spacing between access locations including driveways, public intersections, and interchanges.

The [appropriate authority] shall adopt an access category assignment schedule for the state highway system on or before [date], by rule and regulation, in accordance with the procedures of the state administrative procedures act, for the implementation of this section on state highways. The commission shall assign to each state highway section or segment of highway an access category from the access code. The assignment of access categories shall provide the functional basis for acting on an access permit request. The commission shall revise the schedule as necessary.

In deliberations regarding selection of access category assignments, the commission may consider adopted administrative and functional classifications, existing and projected traffic volumes, current and future highway capacity and levels of service, current and predicted levels of highway safety, adopted state and local transportation plans and needs, the character of lands adjoining the highway, adopted local land use plans and zoning, the availability of vehicular access from local streets and roads rather than from a state highway, and if provided, the initial recommendation of the local authority. The access category assignment process will solicit and consider any recommendations from counties, municipalities, the state land planning agency, regional planning councils, and metropolitan planning organizations.

Subsequent Revisions to Category Assignment Schedule

The appropriate local authority acting by resolution, or the department, may submit to the commission requests for changes in the adopted access category schedule for segments of state highway within its jurisdiction. If the department is seeking a change in access category or making a recommendation for a new section of highway, the appropriate local authority shall be notified of the requested changes. The commission shall consider requests for changes in access category from the department and local governments, but no more than twice per year. Adoption of revisions will be in accordance with rule-making procedures.

Phrases and Words Requiring Statutory-Level Definitions

The legislation should provide definitions for phrases and words requiring statutory-level definitions. For example:

Definitions

As used in this act, the term

1. "Access" means driveway, street, or other means of providing egress and ingress to or from the public right-of-way.

2. "Access code" means the state highway access management code adopted by the department pursuant to this section.

3. "Access permit" means a license issued by the appropriate issuing authority that grants approval to construction and operation of a driveway or other access of a certain design at a specific location on a given roadway for specific purposes.

4. "Access management plan" means a roadway design plan that designates preferred access locations and their designs for the purpose of bringing those portions of roadway included in the access management plan into conformance with their functional classification to the extent feasible.

5. "Local authority" means the board of county commissioners if the access is to be located in the unincorporated area of a county and the governing body of the municipality if the access is to be located within an incorporated municipality.

6. "Functional classification" means a classification system that defines a public roadway according to its purposes in the local or statewide transportation plans. The commission shall determine the functional classification of all state highways. The functional classification of county roads and city streets shall be determined by the appropriate local authority.

7. "General street system" means the interconnecting network of city streets, county roads, and state highways in an area.

8. "Grandfathered" means a condition that existed prior to the effective date of this section, or a condition that was legal and conforming to an earlier code edition or statute, where such conditions and use have not changed since the effective date of the change in law that made the condition nonconforming with current law.

9. "Issuing authority" means the entity that issues access permits and includes the board of county commissioners, the governing body of a municipality, and the department of transportation.

ELEMENTS IN ACCESS REGULATION

This section should provide the reader with an understanding of regulatory topic areas and a basic understanding of their elements, purpose, and relationships. A good regulation is a combination of basic rules, instructions, and smaller supporting details written in a coherent, consistent, and regulatory manner. Most important, a regulation must clearly direct the permittee and agency on process and standards. It must be able to survive critical and adversarial legal and political challenges.

Any rule must reflect its enabling legislation. Some legislatures, through statutory language, may wish to provide more detailed directions or perhaps restrictions or to address additional related issues. However, complex and multi-issue statutes often lead to confusion and unwanted arguments on interpretation and further complicate rule implementation.

This paper does not provide a prototype in the normal sense in that it does not contain a complete set of model texts for an entire regulation. Such a model could be well over 100 pages. This prototype presents a listing of items for inclusion similar to a table of contents, why these items are necessary, and how they are linked. This prototype may be used in conjunction with a copy of the latest Colorado access regulations (1998). Copies of rules from New Jersey, Florida, and Oregon can be obtained for additional ideas. These documents are available on each state's Internet site.

Overview of Regulation

A successful access regulation is a complex and highly integrated structure. Access regulations are further complicated by their broad interdisciplinary scope, which involves engineering, safety, land use, and law. Just as an engineer cannot build a structure with only textbook knowledge, moving from a prototype to a completed and functional rule is a more complex experience than usually anticipated.

Key building blocks include

- Clear procedures for all processing activities;
- Clear standards and warrants for all geometric design elements;
- Clear standards for decisions regarding access locations, type, design, and denial; and
- Well-defined design variance (waiver) procedure with specific criteria and burden of proof.

The wide latitude of engineering and design standards provided in the national literature to guide public agencies on roadway design does not work well with regulations for permitting purposes. National standards are considered guidelines to help professionals who already have a public goal—the best and safest transportation, given available public dollars. Regulation of private individuals and entities requires well-defined standards and procedures.

Standards that allow wide variation create a wide range of agency and developer discretion. This will cause confusion, inconsistency, and claims of arbitrary decision making. This will undermine the program's benefits. Equity and fairness are best achieved through decision consistency, which is best achieved by well-defined standards.

When a range of standards is available, the minimum standards are most always applied to save money. Minimum standards will not be effective in reducing the cumulative safety and operational impacts of poor access management. A minimum standard may result in a higher accident rate, provide lower service to the public, and increase maintenance costs. An agency needs to select the design elements it determines are necessary to reduce the safety conflicts and congestion problems and apply that standard in its access regulations. A design exception process can provide the flexibility when necessary and when documentation is provided. In nearly all available national standards, a "desirable" standard is noted. Colorado access regulations have used desirable-level standards successfully since 1981.

Elements of Regulation

Section 1: Introduction

Authority

- Reiterate statutory authority. This becomes the bottom line for agency permit decisions. Each permit issued must meet the requirements of law and regulation.
- Reiterate that permits are required under all circumstances.
- The agency has clear authority to regulate all access to and from the highway.

Purpose

Reiterate statutory purpose. This becomes the standard for agency permitting decisions. Each permit issued must be written within the purposes of the law and regulation.

Organization of Regulation

A summary of regulatory structure functions better than a table of contents to help the reader proceed through the sequence of steps and better comprehend the regulation.

General Implementation

- No access construction can proceed without an access permit.
- Other basic and overview statements can be included, such as: "In no event shall an access permit be issued or authorized, if it is detrimental to the public health, welfare, and safety" (instructs agency staff).
- No permit may be issued that violates minimum public safety standards (indirectly sets lowest variance standard).
- No permit can be issued without the signature of an authorized agency professional (licensed) engineer.

Definitions and Abbreviations

Clear definitions reduce confusion in regulation interpretation and save burdensome explanations in the body of the regulation.

Computation of Time Regarding Process and Responsibilities

- Time is always important. It is very helpful to include the state's standard court rules on time and date counting.
- Time lines for various procedures remain in the body of the regulation.

References

- References are not critical but help point applicants and consultants in the right direction and help promote design and analysis consistency.
- It may be desirable to make clear that the references are not mandatory. If mandatory, the exact edition of the references must

be used. Subsequent reference revisions are usually not effective until the agency revises the edition reference by rule revision.

Section 2: Instruction

Purpose of Section 2

- Section 2 should clearly provide procedures and not provide design or engineering standards.
- Procedures encompass requirements, required information, and data for processing and decision making.

Access Category Assignments and Procedures for Revisions

- A procedure is required for the initial processing of classification assignments.
- Procedures are required for revision of existing classifications.
- The classification schedule must be a regulation for enforcement of the assignments.
- Since access control is more sensitive to actual land use and operating conditions, it is strongly recommended that access classes be a separate system. The access class system will certainly parallel the National Highway System and other systems to a large degree. However, without a separate access category system, access assignments and later revisions will be difficult.
- The access classification schedule should be a separate, yet related rule.
- Access classifications should be difficult to change. They should be almost as stable as federal classifications or regional master plans.
- A permittee should not be able to lobby for piecemeal classification changes simply for the purposes of facilitating proposed permits.

Submitting an Application for a Permit

- Define what to submit and where to submit it.
- Define any traffic and safety analyses to be submitted and establish when such analyses are required.
- Submitted materials and attachments vary with the scope, size, and issues of the proposal.
- Detailed analysis may be necessary on small proposals for which safety is an issue or if the proposed access is located in a critical area (i.e., where significant problems already exist).
- The agency needs to clearly state that it may require any and all data and information (at applicant's expense) that are necessary for application processing and decision making. Incomplete applications may be rejected.

Agency Processing of Access Permit Application

- What may and what should the agency require in the terms and conditions of the permit? (However, standards should not be included here.) Supply a general statement that the agency may place terms and conditions on the permit that it deems necessary and reasonable in accordance with rules and statutes.
- Define what procedure the agency will follow to make a determination, either denial or approval. Define what constitutes final agency action. State at what point the applicant may officially begin the appeal process.
- Define the process and criteria for denial. Letters announcing denial must substantially itemize denial criteria by regulation section and provide a determination of facts and conclusions.
- Define how long the applicant has to indicate acceptance, by signing the offered permit—30, 60, 90 days?
- How long does the applicant have to appeal a denial or to appeal any term on the permit that the applicant finds unacceptable—30, 60, 90 days?
- The agency must be able to require conformance with other related laws, such as laws concerning hazardous materials and historical and environmental resources that may be physically affected by access construction activities.
- The processing section must clearly put the agency in charge with the authority and discretion to control the design and safety of the roadway. A sample from Colorado reads: "It is within the discretion of the Department and the local issuing authority to grant the access based upon the materials submitted and relevant information available. The Department may grant the access as proposed, require design modifications as it deems appropriate, restrict one or more turning movements as necessary to reduce traffic and safety impacts, or deny the access, all as determined by the standards and procedures of the code."

■ The permission granted by the permit does give certain rights of due process. It is helpful to delineate what rights the permit does not grant. A sample from Colorado reads: "The granting of an access permit conveys no rights, title, or interest in the state highway rights-of-way to the permit holder or property served. A permit for direct access to a state highway does not entitle the permittee to control or have any rights to any portion of the ownership, design, specifications, or operation of the highway or roadway, even those portions of the highway built pursuant to the terms and conditions of the permit."

■ If a permit is construed to grant certain rights within the rights-of-ways, then such rights can interfere with public construction projects. Only two rights are inherent—the right of reasonable access and the right of due process.

■ All application materials and records are permanent records or are records for no less than the life of the permit.

■ Some agencies issue a construction permit first and later issue an access use permit after inspection determines the completed construction is satisfactory. The access use permit functions much as a certificate of occupancy given after a building inspection. Any use before agency approval and issuance of a use permit is illegal access. A single-step permit may result in lengthy litigation to close an uncompleted access in the case that the permittee and agency disagree on the completeness of the access. Meanwhile, the use of the uncompleted access continues.

Access Requests by Local Governments

■ It is easier to treat all applicants in the same way. However, certain laws may not allow the issuing agency to treat another public agency in the same manner as it treats a citizen. For example, it may be appropriate to waive permit fees for local government agencies.

■ The agency should enforce the same design standards upon local governments.

■ New public roads may actually be subdivision streets built by private interests and later given to the local government. Initially, they can be treated as private driveways built by developers.

■ Public roads are somewhat different in that they usually serve many other properties, are in the public interest, and reduce the demand for direct private access. However, public roads often generate higher volumes and often require higher-level design.

Coordination with Local Government Building and Land Use Decisions

■ Foreknowledge and review of proposals in their earliest stages are very helpful to the applicant and to the agency.

■ Such foreknowledge reduces the chances that the developer will invest large sums of money on a proposal that is ill advised or will be denied.

■ The rule should stress coordination between the state and local governments, but it usually takes statute to enforce.

Right-of-Way Dedication

■ Roadway widening for auxiliary turn lanes may require that the permittee dedicate some right-of-way. Improvements to a public highway should not be located on private property.

■ Care should be taken for any hazardous contamination.

■ When obtaining dedication for roadway widening, retain room for sidewalks, bicycles, utilities, and clear-zone control.

Traffic Impact Studies and Safety Analyses

The content and scope of traffic impact studies and safety analyses should be outlined in the section on procedures or be placed in the design standards section.

Fair Share Financial Agreements

Highway improvements for access may benefit (to some degree) adjacent property owners, but it may be years before the adjacent owner can capitalize on the improvements. Fair share arrangements usually take statutory authority and are usually in the form of bonds, escrows, and improvement fees.

Exceptions to Standards and Variance Procedures

■ Clearly define criteria that variance requests must meet for approval. For example, the variance determination shall consider and a variance may be granted where (*a*) not to do so would deny reasonable access,

(*b*) the access variance would not endanger public health, welfare, or safety, and (*b*) failure to grant would cause an exceptional and undue hardship on the applicant.

- The signature of a licensed professional engineer is required.
- No exceptions are given to procedures, only to design standards.
- Variances are considered until every feasible option for meeting desirable access code standards is explored.
- There should be a public necessity to grant a variance, not only a market perception.
- Documents to justify and support the request and subsequent decision must be obtained and placed in the permanent agency file.
- Equal treatment requires that a variance granted to one must also be granted to another where conditions are the same. Variances set precedent.
- When the cause for the variance no longer exists, the permit can require that full standards then be met. If known, the desired action by the permittee necessary to eliminate the substandard condition can be mentioned in the original permit.

Disputes and Appeals

- The appeals process should not cause undue delay or involve too many steps for the appellant or agency. Multiple steps should be avoided before a case proceeds to district court so as not to overextend the agency staff that must prepare for court, testify in court, and justify the decision for each hearing.
- Ensure the agency has an avenue to district court and higher courts, should the agency lose an important decision at a lower level. In some states a public agency is not a "person" and therefore does not have the absolute right of due process.
- The steps of an appeal should be stated clearly in the access regulation, unless such steps are contained in the state's administrative procedures statutes.
- Usually only one administrative hearing is conducted at the agency level before district court. Hearing officers should be independent and not in the line of authority or should be from outside the agency. Hearings conducted by upper management are often viewed as biased by the appellant.
- Access management staff should make the best effort they can (acting for their agency) to resolve a dispute within the regulations. If staff has acted within their authority, with the advice of legal counsel, upper management should avoid reversing a lower staff decision if possible. A decision by upper management countering the decision at the lower level tends to be very discouraging to staff.

Completion of Access

- The access must conform to all permit terms and conditions.
- Inspections may be conducted, and the permittee must follow the directions of the inspector. On-site adjustments may be ordered where necessary.
- Work on the highway should be expeditious to reduce the length of time the public is exposed to construction hazards.
- Proper construction procedures must be used. The agency inspector may insist on compliance and shut down the job if necessary.
- Traffic control plans are necessary (and should be mentioned in the permit) where work will be on or adjacent to the roadway. Standards of the *Manual on Uniform Traffic Control Devices* must be met.
- Materials specifications can come from agency references.
- Good workmanship is required.

Insurance, Bonding, and Liability of Contractors and Permittee

- The permittee should carry the amount of insurance equivalent to the agency's level of liability, if not more.
- The agency should be held harmless, and the permittee shall protect the agency from claims (these conditions are a term of the permit).

Use of Access, Change in Use, and Long-Term Responsibilities

- Few if any agencies put expiration dates on access permits. Issued permits can last several lifetimes. Define how the agency will deal with on-site changes, changes in highway activity, and changes in design standards and warrants. When changes are necessitated, define the rules that will direct the agency on how to implement changes.

■ No permit is designated as permanent. Licenses are not permanent.

■ Permits are licenses. Determine the life the agency will give them—2 to 5 years? or no mentioned date of expiration? Most states do not yet have automatic expiration dates on driveway permits (even though many licensing systems do, such as drivers' licenses and discharge permits). Some states have considered a biannual renewal system, but the advantages of control may not be worth the costs of such a system. In general, the benefits of control must be balanced against the costs of the effort.

Access Violations and Enforcement

■ The agency must have the authority and process in place to act quickly and consistently on violations.

■ The agency must respond quickly when a "clear and present danger" has developed.

■ Define the criteria for determining when the permittee can be notified in advance of any agency direct action.

■ There are no rights of due process for someone who has constructed an illegal access.

■ Violations of the terms and conditions of a legal permit usually require due process before an agency can take direct corrective action, unless a clear and present danger to the public is posed.

Access Management Plans and Procedures

■ An access management plan is an application and permit process involving many accesses and access planning. It is therefore addressed in the section on processing.

■ Define the process for creating an access management plan.

■ Define the data, information, and analyses that are required for submission for an access management plan.

■ Define the procedure for revision of existing plans.

■ An access management plan requires more information than a large development application. It requires a greater array of information than a large development application, because it will affect the surrounding region.

Improvements to Lawful Access

■ Major repairs or improvements may be necessary to existing legal accesses that may not meet current standards but are legal through grandfathering (historical use).

■ The procedure to be followed for improvements or major repairs should encourage upgrades by not threatening revocation.

Maintenance Responsibilities

■ Define who maintains the access, the surface, the drainage, and the auxiliary turn lanes. Define who plows the snow.

■ Define where private maintenance ends—at the edge of the travel way? to the right-of-way line? or beyond to the end of the access influence area?

■ Define procedures governing action when a permittee fails to maintain the access and the access conditions constitute a hazard.

Permit Fees and Forms

■ It is preferred that the fee schedule not be within the regulation or the statute. Fees should be viewed as administrative and not as regulatory action. Authorize the agency director to set fees in writing.

■ The agency establishes forms and requires that only its forms be used. Forms should not be part of the regulation.

Interchange Management Plans

Interchange management plans require a separate regulatory subsection. Although similar to access management plans, they require a different array of information and analysis and address a different set of jurisdictional, political, and policy issues.

Department and Local Government Highway Construction Projects and Regulation Compliance

■ Define how the agency will handle projects that affect existing legal accesses.

■ An owner must be notified if changes are to be made to owned access; this is a right of due process.

■ Define procedures for cases in which a public (agency) project removes or revises the auxiliary lanes or other items that were built by the permittee.

Section 3: Access Category Standards

Section 3 defines a hierarchical class of categories of standards to ensure smooth traffic flow and to maintain the functional level of the public highways. The access category standards serve to determine if an access should be allowed within the context of the highway's function in the transportation system and the assigned access category.

Purpose and Use of Section 3

- Section 3 contains the standards to determine if direct access may be granted that would not be inconsistent with overall functional purposes of the roadway and desirable considerations of spacing, access frequency, level of access conflict, and driveway movement types.
- Define the standards applied to determine access type and any directional or other operational restrictions.
- Define systemwide standards of spacing and delay and other elements that determine quality of flow, level of delay, and safety.

Deeded Access Rights

Define the relationship between access regulations, a police power, and access control by deed, which is the acquisition of property rights.

Access to Designated Freeways

Many states still have and use "freeway law." These are laws developed in the early 1940s before the Interstate system. Address freeway laws here, if they exist.

Categories, Levels of Access, and Classifications

- Establish a hierarchy of a number of categories, each with its function and standards. Include a separate regulation section for each category. Colorado uses eight category levels.
- Keep the number of categories to a minimum. Base the categories on actual functions, not on administrative variations, such as city boundaries.
- Each category includes standards appropriate to function.
- Identify when access is given and when it is denied.
- Criteria for determinations should be specific, not at the discretion of the agency.
- Although several different names are used (category, classification, or access level) for standards, they all establish a hierarchical system of roadway design elements, from freeway to the lowest-function street, in a way that the design elements and standards for each level ensure that the facility will operate at its intended function.
- Include two subsections for each category. One subsection should define function so it is clear what type of arterial is being described and the functional purpose that all proposed accesses must achieve. The other subcategory should describe functional design standards, such as type of access permitted, signal and access spacing required, and conditions for access denial.
- Field approaches are required for rural areas that lack a supporting street system. These areas need special consideration and standards for fields. Colorado defines such approaches as an annual average of less than one trip per day.
- The availability of access to a street or roadway of lower function is a reason for denial of direct access to the higher-function street or roadway.
- Define level of service criteria.
- Define standards for signal spacing.
- Define desired arterial speeds.
- Define standards for signal progression, minimum standards for bandwidth, and speed limits.
- Define desirable spacing for access frequency for nonsignalized access.
- Define auxiliary lane warrants. When Colorado revised its code in 1998, warrants for turn lanes were moved from Section 4 to the individual category so that the lane warrants could vary according to the access category and thus, by level of functional importance.
- The burden of proof that certain criteria are met should be on the applicant, not on the agency.

Section 4: Design Standards and Specifications

Section 4 provides standards for the design and construction of all accesses. These standards are based upon criteria and specifications necessary to ensure the public health, welfare, and safety.

Purpose and Use of Section 4

- Section 4 provides specific geometric designs, specifications, and warrants for each element.
- Only if an access request meets category standards (Section 3) can the request progress to design considerations.
- Failure to meet design standards of Section 4 is basis for denial.

Reference Sources and Data Requirements

Design is based on data, predictions, and, to the degree not specifically addressed in the regulation, national standards. Requiring the use of specific references and data increases consistency.

Access Width

- In a way similar to a highway without striping, wider accesses can suffer delineation failures and therefore irregular location of entering and exiting vehicles. It is assumed that private driveways will not be striped and that the access' physical design (i.e., limited width) will guide motorists to the proper location within the access.
- Narrow driveways can cause congestion within the throat, which, in turn, can cause a queue onto the highway.
- It is assumed that a driveway should not be wider than necessary to accommodate the predicted volumes with little conflict within the driveway throat.
- A three-lane width of 36 feet is normally considered maximum.

Access Radii

- Larger radii increase the speed of exiting vehicles. However, the increased speed can pose a problem for pedestrians and reduce safety in the parking lot. The higher exit speed does reduce exposure and conflict on the highway but may be excessive for the driveway and parking lot. A deceleration lane reduces conflict on the roadway and allows lower exit speeds, therefore higher levels of safety, in the driveway transition.
- Larger radii are difficult for use with curb cuts (depressed curb).
- Larger radii create a wide access: 50-ft radii on a 35-ft access produce an edge of roadway width of 135 ft. This is very difficult for pedestrians, is expensive to build, consumes significant amounts of square feet of right-of-way and private property, and can lead to delineation failure.
- Driveway width is measured at the throat behind the radii.

Access Surfacing

- Hard surfacing (hot bituminous pavement or concrete) protects road edge, reduces mud and rock on the road, and reduces maintenance.
- A "landing pad" of hot bituminous pavement or gravel extending 20 ft at 2% downgrade helps reduce mud and dirt on the highway.
- Hard surfacing permits higher initial acceleration onto the roadway.

Weaving Areas

Weaving is not defined in national standards to the degree necessary to regulate, but it should be a consideration in access spacing where volumes are high.

Speed Change Lanes

- Define general criteria (warrants) for speed change lanes.
- Turn lanes for any volume can be viewed as desirable, because a turn lane reduces speed differential in the travel lane.
- Define at what volume it is financially feasible and reasonable to require a speed change lane.
- A left-turn lane has the additional purpose of sheltering turning vehicles as they wait for a gap in oncoming volumes. The majority of driveway accidents are related to left-turn movements. Therefore, left-turn lanes are more necessary than right-turn lanes (volumes being equal), but left-turn lanes are significantly more expensive and more difficult to install.
- Deceleration lanes for right-turning vehicles reduce rear-end conflicts and reduce conflicts caused by speed differential.
- Acceleration lanes for right-turning vehicles permit vehicles to merge at more acceptable speed differentials as long as the acceleration lane is sufficiently long.
- Define standards for deceleration lanes for left-turning vehicles.
- Define standards for acceleration lanes for left-turning vehicles.
- In 1998, Colorado moved its turn lane warrants to Section 3 to allow the warrants to vary according to access category.

Construction of Speed Change Lanes

- Define speed change lane lengths, which vary for speeds, volumes, and vehicle types.
- Define standards for taper design. Auxiliary lane and redirect tapers vary with speed.
- Define standards for median design and for determining if the median will be at grade or raised; of what type, size, and cost; and the provisions for winter and seasonal maintenance problems and costs and drainage complications.
- Define criteria for storage length.
- Define criteria for adjustments for grade.

Sight Distance

- Set sight distance standards for entering and traveling vehicles to minimize collision potential.
- Set sight distance standards to minimize speed differential by allowing a view of larger distances and choices of larger gaps.
- Entering sight distance varies according to the number of highway lanes (exposure).
- Adequate sight distance helps reduce the effects of entering-speed differential on roadway performance.

Drainage

- Set criteria for side drains, cross drains, and retention ponding.
- Most state rights-of-way are not designed to act as local or regional drainage systems.
- The agency is only responsible for historical surface flows. New peak flow must be retained on site.
- Set standards for drainage study.
- Define specifications and structure types for drainage.

Other Design Elements

- Set criteria for sidewalks and related pedestrian treatments within the right-of-way and during construction.
- Define standards for bicycle and pedestrian transitions across the access.
- Set criteria for crossings and curb drops for the handicapped in accordance with the federal Americans with Disabilities Act.
- Set standards for the access profile, sag, and vertical curve.
- Set standards for the design of the curb, gutter, center median, and edge drainage.
- Set standards for the barrier curb along parking lots and other paved areas.
- Set standards for signing and striping and determine who shall pay for these operations.
- If it has the authority, the agency should set standards for setbacks for all permanent structures to ensure sight distance control.
- Set standards for side slopes that will achieve AASHTO desirable recommendations.
- Set standards for a clear zone and obstructions that will meet AASHTO guidelines.

Maintenance of Completed Access

- Maintenance procedures can be placed in the section on procedures under permittee responsibilities.
- Determine who should repair access within the right-of-way.
- Determine who should repair and maintain the drainage system and the culvert.

ACCESS CLASSIFICATION SCHEDULE

Assuming the access regulation has a category system, it is necessary to establish a schedule that lists the category of each highway segment. Because this list determines the level of access to private property, it should be adopted as a regulation. The access classification schedule lists—line by line and milepoint to milepoint—all highway routes and portions thereof by assigned access category. Procedures for the selection of categories remain in the main regulation.

SAMPLE REGULATIONS IN NEW YORK

To aid the reader in developing local regulations that foster good access management, the second half of this chapter provides a handful of existing regulations in local communities across New York. The following sample local access management regulations are included in this chapter:

- Farmington
- Livonia
- Fort Edward
- East Fishkill
- Hartford
- Greenwich
- Salem
- Queensbury

Each municipality handles access management controls differently. Table 1 summarizes the tools each utilizes.

Table 1: Access Management Regulation Tools Utilized in Various New York Municipalities

		Standards Relating to Access Management Technique:					
	Regulatory Method	Driveway Design	Parcel Access	Shared Access	Driveway Spacing	Roadway Spacing	AM Overlay Districts
Farmington	Zoning Ordinance	X	X	X	X		X
Livonia	Zoning Ordinance: AM Regulations	X	X	X	X	X	X
Fort Edward	Site Plan Review, Zoning Ordinance		X	X	X		
East Fishkill	Zoning Ordinance: Planning Board Special Permits-Supplemental Use Regulations			X			
Hartford	Zoning Ordinance	X	X	X	X	X	
Greenwich	Site Plan Review, Zoning Ordinance	X	X	X	X	X	
Salem	Site Plan Review, Zoning Ordinance, Comprehensive Plan		X	X	X		
Queensbury	Zoning Ordinance: Regional Project Review, AM, and General Exceptions	X	X	X	X		X

FARMINGTON

§ 165-34. MTOD Major Thoroughfare Overlay District. [Added 3-24-1987 by L.L. No. 1-1987; amended 8-9-1988 by L.L. No. 8-1988; 8-11-1998 by L.L. No. 4-1998]

A. Intent. It is intended, by the provisions of these regulations, to accomplish the following:

(1) To restrict or control site access along Route 332 and those mapped portions of State Route 96 in the Town of Farmington in order to prevent the creation of strip commercial development as well as potentially significant traffic congestion problems and vehicular and pedestrian conflict areas with the Major Thoroughfare Corridor. The Major Thoroughfare Overlay District is designed to permit appropriate commercial, industrial, and business uses along the corridor and to ensure consistency with the Route 96 and Route 332 Corridor Development Plan Official Map, as adopted and amended by the Town of Farmington. [Amended 5-25-1999 by L.L. No. 3-1999]

(2) The regulations contained within this Major Thoroughfare Overlay District are not intended to be substituted for other general zoning district provisions but can be superimposed over such district provisions and should be considered as additional requirements to be met by the applicant or developer, prior to final project approval. This Major Thoroughfare Overlay District is intended to provide the Town of Farmington with an additional level of review and regulation that will control how land development permitted by the Town's primary zoning districts will take access to and will impact the major transportation routes within the Town.

B. Delineation of Major Thoroughfare Overlay District (MTOD) boundaries. The MTOD is hereby established as a mapped overlay zone on the Official Zoning Map of the Town of Farmington. The basis for amending the Town Official Zoning Map is the adoption of the Route 96 and Route 332 Corridor Development Official Maps hereby established by the Town Board and entitled "Route 96 and Route 332 Corridor Development Plan," which consists of a total of four sheets and identified as Project No. 061142. Any property or parcel of land which contains frontage on New York State Route 332, or on any parcel frontage on New York State Route 96 as shown on the "Route 96 and Route 332 Corridor Development Official Map" shall be considered to be within the boundary of the MTOD. Any use of land lying within the boundary of the MTOD shall first be subject to provisions and restrictions of the underlying zoning district and the provisions of this section of the Town Code. [Amended 5-25-1999 by L.L. No. 3-1999]

C. Permitted principal uses. Permitted principal uses within the Major Thoroughfare Overlay District shall be those allowed with the underlying or base zoning district within which the property lies and shall be subject to the appropriate principal use provisions and restrictions of that district.

D. Permitted accessory uses. Permitted accessory uses within the Major Thoroughfare

Overlay District shall be those allowed within the underlying or base zoning district within which the property lies and shall be subject to the appropriate accessory use provisions and restrictions of that district.

E. Special permit uses. Uses within the Major Thoroughfare Overlay District which are permitted subject to special permit review and approval by the Town Planning Board shall be those subject to such permit within the underlying or base zone district within which the property lies and shall also be subject to the appropriate special permit provisions and restrictions of that district, as well as of § 165-99 of this chapter.

F. Dimensional requirements. Dimensional requirements for development within the Major Thoroughfare Overlay District shall be those setbacks, lot size and lot coverage provisions of the underlying or base zoning district within which the subject property lies, as outlined in Schedule I of this Zoning Chapter, Editor's Note: Schedule I is included at the end of this chapter. unless otherwise provided by this chapter.

G. Setbacks. Properties located in the Major Thoroughfare Overlay District shall be governed by the following setbacks:

(1) Side yard: 30 feet.

(2) Setback from an access road: 50 feet.

(3) Setback from Route 332 or Route 96: 100 feet.

H. Additional site plan and special use permit provisions and requirements. The requirements of §§ 165-44, 165-57B, 165-60C, 165-99C and 165-100 shall apply in the review and approval of any site development plan or special use permit required for property within the Major Thoroughfare Overlay District.

I. General access management requirements.

(1) Regulations applicable to all zoning districts within the MTOD Overlay District:

(a) The location and design of driveways and other site layout, parking and access management conditions shall conform to all state and local requirements, including and not limited to those established in this section.

(b) The site layout, location and design of driveways, parking and other access management conditions should be based on full development of a lot.

(c) Driveways should be limited to one per lot. More than one driveway may be permitted if:

[1] The additional driveway(s) does not degrade traffic operations and safety on the public road system; and

[2] The additional driveway(s) will improve the safe and efficient movement of traffic between the lot and the abutting public road.

(d) Driveways to properties with frontage on two or more roads shall be provided to the road with the lowest functional classification serving the proposed development.

(e) Driveways may be required to be located so as to provide shared driveways and/or cross-access driveways with an abutting lot or lots.

[1] Shared driveways and/or cross-access driveways shall be of sufficient width (minimum 20 feet, 6.0 meters) to accommodate two-way travel for automobiles and emergency service and loading vehicles. Wider driveways may be required to serve traffic to major developments or large vehicles.

[2] Shared driveways, cross-access driveways, interconnected parking and private roads constructed to provide access to properties internal to a subdivision shall be recorded as an easement and shall constitute a covenant running with the land. Operating and maintenance agreements for these facilities should be recorded with the deed.

(f) Except when located at a signalized intersection, a motor vehicle service station, convenience store/petroleum station and petroleum station located in the MTOD district must meet both the spacing standards detailed in § 165-77D as well as all the spacing standards detailed in this § 165-34. A motor vehicle service station, convenience store/petroleum station and petroleum station located at a signalized intersection need only meet the spacing standards detailed in this § 165-34. [Added 12-12-2000 by L.L. No. 1-2000]

J. Driveway standards.

(1) Spacing standards. Regulations relate to the required separation, location and standards for driveways providing access to and from roads listed in the MTOD Overlay District. Each driveway constructed within the MTOD shall comply with the following:

(a) Driveways shall be located so as to meet or exceed the driveway spacing standards shown in Table 1.

Table 1

Minimum Driveway Spacing Standards

Type of Development/ Type of Road	Small Development (0 - 150 PHT)	Moderate Development (151 - 300 PHT)	Large Development (301 PHT or more)

All state roads	220 feet	330 feet	550 feet
Local collectors and arterials	150 feet	250 feet	400 feet
Access and Development	50% of the required frontage	65% of the required frontage	80% of the required frontage

[1] PHT, peak hour trips, will be determined through application of the Institute of Transportation Engineers trip generation methods and statistics. With permission from the Town Planning Board, another methodology or other statistics for determination of peak hour trips may be used.

[2] PHT, peak hour trips, should be based on full build-out of the lot.

[3] The larger of the minimum driveway spacing standards for the proposed subdivision or development or existing developments at abutting properties will apply. Driveways for in-fill development must meet the minimum driveway spacing standards to driveways at abutting properties on both sides.

(b) Driveway spacing standards shall apply to driveways located on the same side of a road.

(c) Driveway spacing is to be measured along the road from the center line of the driveway to the center line of the next driveway.

(2) Corner clearance.

(a) Corner clearance is to be measured along the road from the center line of the driveway to the closest edge of the road determined by the State Department of Transportation, unless otherwise specified elsewhere in this chapter.

(b) Driveways for corner properties where there is no traffic light, either existing or planned, shall meet or exceed the minimum corner clearance requirements as follows:

[1] Full access (all driveway movements) where there is no median barrier involved: 220 feet; or

[2] Partial access (restricted driveway movements) where there is a median barrier involved: spacing shall be as required in Table 1 of these regulations. Editor's Note: See Subsection J(1) above.

(c) Driveways for corner properties where there is a traffic light, either existing or planned, shall meet or exceed the minimum corner clearance requirements set

forth in Subsection J(2)(b) above, unless said driveway is located within the functional boundary of the intersection as delineated on the Town of Farmington Routes 96 and 332 Corridor Development Plan Map, adopted by the Town Board. Editor's Note: Said map is on file in the Town offices. In those instances, said driveway is to be located based upon the results of a traffic impact statement and permit issued by the appropriate regional office of the State Department of Transportation.

(3) Driveway location.

(a) Driveway location will be based on a site plan which has been approved by the Town Planning Board in consultation with the New York State Department of Transportation or the Town Engineer/Town Highway Superintendent.

(b) For the purpose of driveway locations, median openings shall be treated as intersections, and driveways to properties opposing a median opening shall be located so as to meet or exceed the minimum corner clearance standards, except where a median opening is specifically constructed or reconstructed to provide vehicular access to such properties.

(c) Driveways shall be located so as to meet or exceed the minimum driveway spacing standards and the minimum corner clearance standards.

(d) The Town Planning Board may allow the location of driveways at less than the minimum driveway spacing standards and corner clearance standards if:

[1] A dual-driveway system, cross-access driveway system or shared driveway is proposed and this improves the safe and efficient movement of traffic between the lot and the road; or

[2] A driveway or driveways could be located so as to meet the minimum driveway spacing standards and corner clearance standards, but the characteristics of the lot or the physical or operational characteristics of the road are such that a change of location will improve the safe and efficient movement of traffic between the lot and the road; or

[3] Conformance with the driveway spacing standards or corner clearance standards imposes undue hardship on the lot owner.

(e) For properties unable to meet the minimum driveway spacing standards or corner clearance standards, a temporary driveway may be granted. The granting of a temporary driveway will be conditioned on obtaining a shared driveway, cross-access driveway or unified parking and circulation with an abutting lot, and closure of the temporary driveway, in the future.

(f) For properties unable to meet the minimum corner clearance requirements, driveways shall be located as far as practicable from the intersection. In such cases, driveway movements may be restricted and only one driveway will be permitted along the road frontage not meeting the minimum corner clearance requirement.

(4) Driveway design.

(a) Driveways shall be designed so as to provide for the safe and efficient movement of traffic between the public road and the lot and to eliminate the potential for the queuing of vehicles along the public road due to congestion in or at the driveway.

(b) Vehicle circulation systems on the lot shall be designed so as to provide for the safe and efficient movement of traffic between the driveway and the parking area.

(c) Driveway width, radii, flare, throat length, internal circulation systems and other design elements for driveways to developments generating more than 150 peak hour trips shall be based upon traffic, engineering and design data provided by a traffic engineer/consultant who is recognized and accepted by the Town Planning Board. In the event that a traffic engineer/consultant is not provided, the Town shall have the right to retain such traffic engineer/consultant at the cost of the applicant.

(5) Driveway movements.

(a) Driveway movements (cross, left turn in, left turn out, right turn in and right turn out) may be restricted so as to provide for the safe and efficient movement of traffic between the road and the lot.

(b) Driveways shall be designed and constructed to provide only the allowable movements.

(6) Changes in access.

(a) The Town Planning Board may establish provisions for and require future alteration of the lot layout, the location and design of driveways, parking and other access features based on phased development, additional development or a change in use of a lot, or development of or a change in use at an abutting lot.

(b) On completion of a side, access or service road abutting a lot with a driveway connection to a public road, the Town Planning Board may require a driveway or driveways to the side, access or service road and closure of the driveway connection to the public road.

(c) For any change or use of a lot which requires a Town permit or approval and increases peak hour trips, the Town Planning Board may:

[1] Require the closure or relocation or consolidation of driveways so as to meet the minimum driveway spacing standard for the new level of peak hour trips.

[2] Require shared driveways and cross-access driveways with abutting lots.

[3] Require alteration of the lot-layout and parking which allow for the circulation of traffic between abutting properties.

(7) Medians.

(a) The type, location and length of medians on state roads will be determined by the New York State Department of Transportation. This determination will be made in consultation with the Town Planning Board and will be based on existing and projected traffic conditions; the type, size and extent of development and traffic generated by development; traffic control needs; and other factors.

(b) The minimum spacing between median openings will be 1,320 feet for median openings which restrict the directional movements of vehicles using the opening and 2,640 feet for median openings which do not restrict the directional movements of vehicles using the opening.

(c) The minimum spacing between median openings may be waived with the mutual agreement of the Town Planning Board and the New York State Department of Transportation.

(d) Median openings intended to serve a driveway or driveways to a development or developments must meet or exceed the minimum spacing standards between median openings and must also be justified by a traffic impact analysis approved by the New York State Department of Transportation in consultation with the Town Planning Board when driveways are proposed to connect to state roads, or the Town Planning Board when driveways are proposed to connect to local roads. The cost for preparation of the traffic impact analysis and construction of the median opening or openings, including installation and operation of signals and other improvements where warranted, shall be born by the applicant.

K. Classification of large development within the MTOD Overlay District. Development within the MTOD is classified as either small development, medium development, or large development. Table I of these regulations establishes the standards for all three types of development. Editor's Note: See Subsection J(1) above. Large developments are

likely to have the potential for significant adverse impacts on the environment and, therefore, are further subject to the following criteria:

(1) For purposes of this section, large developments shall include residential developments and mixed-use subdivisions whose combined trip generation from all lots exceeds 150 peak hour trips; commercial, retail and industrial developments whose trip generation exceeds 300 peak hour trips; and any use which will, in the opinion of a qualified traffic engineer, detrimentally impact the safe and efficient movement of traffic along public roads.

(2) Large developments may be required to mitigate the traffic impacts of their development. Required mitigation may include but is not limited to the construction or signals, turning lanes, medians, combined and shared driveways, internal service or access roads and implementation of transit improvements and/or traffic demand management strategies. This requirement may be waived with:

(a) New York State Department of Transportation approval for mitigation required on or along a state road.

(b) Town approval for mitigation required on or along a local road.

(3) Required mitigation will be identified through a SEQRA review or transportation impact study.

L. Land subdivision criteria. All proposed development of land located within the MTOD, which involves the subdivision of a parcel of land not in effect as of the effective date of the adoption of these regulations, shall be subject to the following criteria in addition to that set forth in Chapter 144, Subdivision of Land, of the Code of the Town of Farmington.

(1) Planned access shall be provided for lots which are the result of subdivisions occurring after the effective date of this section.

(2) Planned access shall address the provisions of this section and the following:

(a) Lots which are the result of a subdivision do not have the right of individual access to public roads. The number of driveways or other connections shall be the minimum number necessary to provide reasonable access to these lots, not the maximum available for the frontage.

(b) Driveways shall be provided to the road with the lowest functional classification serving the proposed land use.

(c) Access should be internalized. Access to lots within a subdivision should be obtained from an access road or interior road.

(d) The access system for the proposed subdivision should be coordinated with existing, proposed and planned streets outside the subdivision.

(3) Shared driveways, cross-access driveways, interconnected parking and private roads constructed to provide access to lots internal to a subdivision shall be recorded as an easement and shall constitute a covenant running with the land. Operating and maintenance agreements for these facilities should be recorded with the deed.

M. Incentives for land development within the MTOD. In accordance with the provisions of § 261-b of New York State Town Law, the Town Board, upon recommendation from the Town Planning Board, may grant incentives to proposed development occurring within the MTOD area when the following conditions are found to exist:

(1) In order to ensure the safe and efficient movement of traffic along a road and between the road and properties abutting the road, shared driveways, cross-access driveways, access and service roads, internal circulation systems and interconnected parking are encouraged.

(2) The Town Board, based upon a Town Planning Board recommendation which is first based upon approval of a preliminary site and/or subdivision plan, may grant adjustments to the permissible density, area, height or open space otherwise required in the zoning district when such lot owner elects to provide and maintain shared driveways, cross-access driveways, access and service roads, internal circulation systems, or interconnected parking.

(3) The Town Planning Board reserves the authority to determine the adequacy of the access management amenities to be accepted and the particular bonus or incentive to be provided to a lot owner.

N. Variance standards for development within the MTOD Overlay District.

(1) In addition to the standards and criteria for development set forth elsewhere in the Town of Farmington Code, the Town Board hereby enacts the following additional standards for the granting of variances associated with development within the MTOD Overlay District:

(a) The granting of an area variance shall be in harmony with the purpose and intent of this section and shall not be considered until every reasonable option for meeting the provisions of this section is explored.

(b) Applicants for an area variance must demonstrate unique or special conditions that make strict application of the provisions of this section impractical. This shall include a showing that:

[1] Indirect or restricted access cannot be obtained;

[2] No reasonable engineering or construction solutions can be applied to mitigate the condition; and

[3] No reasonable alternative access is available from a road with a lower functional classification than the primary road.

(c) Under no circumstances shall an area variance be granted unless not granting the variance would deny all reasonable access, endanger public health, welfare or safety or cause an exceptional and undue hardship on the applicant. No area variance shall be granted where such hardship is self-created.

(2) Additional provisions and requirements.

(a) Lot area, bulk and coverage requirements.

[1] Lot area, bulk and coverage requirements shall be as defined in the Town of Farmington, Schedule I, Lot Area, Bulk and Coverage Requirements, Editor's Note: Schedule I is included at the end of this chapter. except as otherwise provided for in this chapter.

[2] Lots within the MTOD Major Thoroughfare Overlay District which take access to state roads shall have a minimum width which allows the placement of driveways within the minimum driveway spacing standards as defined in Chapter 165, Article IV, § 165-34J. Such width may be reduced, at the discretion of the Town Planning Board, where the lot obtains access through a shared driveway or a cross-access driveway or provides a separate driveway to another road.

[3] Lots within the MTOD Major Thoroughfare Overlay District which take access exclusively from a local collector, local arterial, access road or development road shall have a width which allows the placement of driveways within the minimum driveway spacing standards for such roads as defined in Chapter 165, Article IV, § 165-34J. In such cases the minimum lot width required along State Route 332 and State Route 96 shall be as defined in the Town of Farmington, Schedule I, Lot Area, Bulk and Coverage Requirements. Editor's Note: Schedule I is included at the end of this chapter.

§ 165-50. Access control.

In order to encourage the sound development of street frontage, the following special regulations shall apply to all uses permitted within the business and industrial districts:

A. Access barrier. Access to streets shall be controlled in the interest of public safety. Each

building or group of buildings and its parking or service areas shall be physically separated from the highway line by a curb and planting strip or other suitable barrier to control motor vehicle access, except for access points authorized herein.

B. Access points. Insofar as practical, the use of common access points by two or more permitted uses shall be provided in order to reduce the number and closeness of access points along the streets and to encourage the fronting of business and industrial structures upon a parallel access street and not directly upon a public road. Access points for uses generating more than 150 peak hour trips shall not be less than 24 feet nor more than 50 feet in width. All other access points shall not be less than 20 feet nor more than 40 feet in width. [Amended 8-11-1998 by L.L. No. 4-1998]

(2)In addition to the information submission requirements of § 165-100, the Town Planning Board may require an application for special use permit review and approval to be accompanied, in the following cases, by a transportation impact analysis, to be prepared by the applicant, and reviewed by the Town Planning Board: [Amended 8-11-1998 by L.L. No. 4-1998]

(a) Any retail, commercial or industrial development which proposes direct access to a collector or arterial road outside of the boundaries of the MTOD Major Thoroughfare Overlay District.

(b) Any large development to be located on property within the boundaries of the MTOD Major Thoroughfare Overlay District, as defined by Article IV, § 165-34K.

(c) Any residential development which proposes to have more than 25 dwelling units.

(d) Any other use which may, in the opinion of a qualified traffic engineer, detrimentally impact the safe and efficient movement of traffic along public roads.

LIVONIA

LIVONIA ACCESS MANAGEMENT CODE

NOTE: Section references as printed are based on the Town chapter numbering (zoning is Chapter 150, subdivision is Chapter 125). Article and section numbers in the zoning and subdivision chapters are the same for the town and village code. For Village regulations, zoning is Chapter 155 and subdivision is Chapter 130.

Article XV Access Management

§ 150-124. Intent.

The purpose of these access management standards is to provide safe and efficient travel along public streets. These standards are based on the goals and strategies of the Livonia Transportation and Access Management Plan. The standards balance public and private interests. Implementation of these access management standards is intended to reduce confusion, congestion, and accidents by limiting conflict points. These standards are also intended to guide development of a street network with sufficient linkages between uses. The standards will contribute to the long-term accommodation of growth and development while providing safe and convenient access to properties and preserving the visual character of area streets.

§ 150-125. Definitions.

ACCESS- A way or means of approach to provide vehicular or pedestrian entrance or exit to a parcel.

ACCESS CONNECTION, VEHICULAR - Any driveway, private street, turnout, or other means of providing for the movement of vehicles to or from a public street.

ACCESS MANAGEMENT - The process of locating and designing vehicular access connections to land development to preserve the flow of traffic in terms of safety, capacity and speed.

CORNER CLEARANCE - The distance from an intersection of two or more streets to the nearest access connection.

CROSS ACCESS - The layout of circulation patterns and recording of a permanent enforceable right of access to allow travel between two or more contiguous parcels without traveling on a public street.

DRIVEWAY - Any entrance or exit used by vehicular traffic to or from land or building to an abutting street.

DRIVEWAY, SHARED - A driveway in common ownership or subject to a permanent enforceable right of access by those traveling to or from a use on another parcel.

FUNCTIONAL AREA (INTERSECTION) - The area adjacent to the intersection of two or more streets that encompasses required vehicle queuing areas and the decision and maneuvering area for vehicles using the intersection.

FUNCTIONAL CLASSIFICATION - A system used to group public streets into classes according to their purpose in moving vehicles and providing access to abutting properties.

NONCONFORMING ACCESS - An access connection existing prior to the date of adoption of these regulations which in its design or location does not conform with the requirements of this Chapter.

PARCEL - A division of land comprised of one or more contiguous lots in common ownership.

PEAK HOUR TRIP (PHI) GENERATION - a weighted average vehicle trip generation rate during the hour of highest volume of traffic entering and exiting the site or the highest volume of the adjacent street.

REASONABLE ACCESS - The minimum number and type of access connections, direct or indirect, necessary to provide safe access to and from a public street, as consistent with these regulations and other relevant plans and policies of the Town or Village of Livonia.

RESTRICTIVE MEDIAN - A physical barrier such as a metal or concrete structure or a grass or landscaped island within the street right-of-way that separates traffic by direction of travel.

STREETS, ACCESS and DEVELOPMENT - Streets not otherwise classified. The primary function of such streets is to move traffic within subdivisions and large developments and to provide access to individual lots.

STREET, COLLECTOR - Those portions of the Livonia transportation system providing important links between major streets or serving large residential or non-residential developments. Collector streets must balance the desirability of the free flow of traffic and access needs_ Additional collector streets may be designated by resolution of the municipal board and an up-to-date list shall be available in the Building and Zoning Department office. Collector streets currently include the following streets which are under the jurisdiction of the Livingston County Highway Department.

Bronson Hill Road

East Lake Road

Federal Road

Livonia Center Road

Poplar Hill Road

Richmond Mills Road (NYS 15A to Richmond town line)

South Lima Road

These regulations also designate as collector streets the following streets under town jurisdiction:

Stone Hill Road (from NYS 15 to Poplar Hill Road)

Proposed New Road

Big Tree Street/Road

Cleary Road

Summer Street

Pennemite Road

Portions of these streets within the Village of Livonia are designated as local streets.

STREET, LOCAL - The primary functions of such streets is to move traffic between subdivisions as well as to provide access to individual lots.

STREET, MAJOR - Those portions of the Livonia transportation system under State or Federal jurisdiction or designated as a major street by a local municipal board A major street typically moves larger volumes of traffic over greater distances compared to other street types. This function of mobility or the free flow of traffic must be considered when defining reasonable access to such streets. Access is a secondary functions of such streets. The following lists the route numbers and names of streets wholly or partially under State or Federal jurisdiction.

Route Number	**Location**
NYS 15	Rochester Road, Big Tree Road, Big Tree Street, Main Street, Commercial Street, Conesus-South Livonia Road
NYS 15A	Plank Road and Bald Hill Road
NYS 256	West Lake Road
US 20A	Big Tree Road, Big Tree Street, Main Street, Richmond Mills Road, Plank Road, US 20A

TEMPORARY ACCESS - Provision of direct access to a street until such time as adjacent parcels are developed and planned access via a shared driveway or access development street can be implemented.

§ 150-126. Applicability.

These access management standards shall apply to all uses in all districts. More specifically:

A. All land subdivisions receiving preliminary approval after the date of adoption of these regulations and all lots created by such subdivisions shall demonstrate conformance to the maximum extend practicable with the requirements and objectives of these regulations.

B. Any construction, alteration, or change of use on a lot existing prior to the date of adoption of these regulations which requires site plan approval, shall demonstrate conformance to the maximum extent practicable with the requirements and objectives of these regulations.

§ 150-27. General Requirements.

A. Access and circulation shown on subdivision and site plans developed under these regulations shall also conform to the requirements of other federal, state, and local agencies responsible for transportation system elements proposed for modification. This includes but in not limited to transportation agency standards for stopping and intersection sight distances, signal warrants and, if applicable, the subdivision regulations of Chapterl25 and other portions of this Chapter especially the district regulations of Article VI, the off-street parking and loading regulations of Article X and the site plan review regulations of Article XIV,

B. Deviations from the standards outlined in this Article for developments generating more than 150 peak hour trips must be based on documentation from a qualified traffic engineer that an alternative access arrangement provides equal or greater safety and mobility and comparable or lower adverse environmental impacts. All such deviation must be in accordance with the procedures and requirements for obtaining an area variance as specified in § 150-17 of this Chapter. The Joint Planning Board has discretion for approving deviation from the standards for uses generating less than 150 peak hour trips and reserves the right to require professional

justification of deviation from standards for projects generating less than 150 peak hour trips.

C. Parcels created after the effective date of these regulations do not have the right of individual access to existing abutting public streets. The number of planned access connections is to be the minimum necessary to provide safe and reasonable access. This may be less than the number of access connections which would be allowed based solely on minimum property width requirements.

D. New public or private streets, shared driveways or cross access may be necessary to meet the requirements of these regulations. If access is to be provided by means other than direct access to a public street, a permanent recorded easement, which runs with the land, shall be executed. In addition, operating and maintenance agreements for all such facilities shall be recorded with the deed.

E. Subdivision of a parcel with frontage on two or more streets may be required to provide access from all lots which result from the proposed subdivision to all such streets without traveling on the existing street network. In most cases, even if a vehicle connection is not provided, a pedestrian connection shall be provided.

F. Parcels with frontage on more than one street may be limited to one access connection to the lowest class of street serving the proposed development.

G. Unless otherwise specified, all distances shall be measured from centerline to centerline along the edge of the street right-of-way. Where street or intersection modifications are planned, all distances shall be from the proposed centerline along the edge of the proposed right-of-way.

§ 158-128. Access to subdivided lands and phased, full build-out and multi-owner development plans.

A. Prior to subdivision or site plan approval or approval of a zoning permit for any new or modified access or intersection, the applicant must provide a concept plan. The concept plan shall show the location of buildings, parking, and circulation including connections to preexisting streets, and alignments of any new streets necessary to accommodate full build-out as allowed by current zoning for all lands under single ownership as of the date of adoption of these regulations.

B. Access to individual residential driveways within a subdivision should be obtained from an access or development street.

C. Access to other uses in a proposed subdivision should be coordinated with existing, proposed and planned streets and driveways outside the subdivision, and should consider providing cross access connections to abutting developed or undeveloped properties.

D. When the concept plan for access to lands planned jointly or under common ownership as of the date of adoption of these regulations shows development of a an access or development street as part of eventual full build-out, the Joint Planning Board may allow temporary access directly to a public street while requiring that parcel layout be designed to provide future access only from the proposed access or development street. Furthermore, the Joint Planning Board may establish square footage or peak hour trip generation thresholds which govern when construction of the access or development street must take place.

§ 158-129. Driveway Spacing Standards.

A. Minimum recommended spacing between driveways on the same side of the street are as follows:

Street Type	Recommended Driveway Separation (in feet)
Major Street	330
Collector Street	220
Local Street	80 percent of lot width
Access or Development Street	80 percent of lot width

B. Access connections on opposite sides of the street not separated by a restrictive median shall be aligned or off set so as to eliminate left-turn overlap conflicts between vehicles traveling in the opposite direction

C. Access connections to development on opposite sides of the street with peak hour trip generation of 150 or more may be required to be aligned to enable installation of a traffic signal to serve both developments.

D. On the advice of the municipal engineer, the Joint Planning Board may raise or lower the required driveway spacing standard based on the volume of site generated traffic, the impact of site generated traffic on the operation of the adjacent street. or posted or operational speeds in the vicinity of the proposed site.

E. The Joint Planning Board as part of site plan review will evaluate how proposed driveway location impacts opportunities to develop abutting properties. At a minimum such evaluation shall identify any sight distance and alignment/offset constraints and indicate whether compliance with the recommended spacing standards is practicable for abutting properties based on applicant's proposed driveway location.

§ 150-130. Corner Clearance.

The following standards shall guide approval of driveway access on comer parcels:

A. A .Generally no driveways shall be allowed within the functional area of the intersection. If parcel boundaries or topography preclude location outside the functional area of the intersection, access may be limited to right turns in and/or right turns out and/or left turns in. As determined by the municipal engineer and, the driveway shall generally be located as far from the intersection as possible and in the safest possible location.

B. Development on corner parcels should be linked by cross access to abutting properties o£ the same type (i.e, residential or non-residential).

C. Driveways for corner parcels with frontage along a major or collector street shall be located no closer than 220 feet from the intersection.

D. If no alternative reasonable access exists, partial (right-in/right-out) access that does not create safety or operation problems may be allowed if located a minimum of 110 feet from the nearest edge of existing or proposed pavement.

Driveways for corner parcels with frontage solely along local streets or access or development streets shall be located no closer than 60 percent of the minimum lot width.

E. Corner clearance is to be measured along the street right-of-way from the centerline of the driveway pavement to the closest edge of the existing or proposed street pavement.

§ 150-131. Street and Signal Spacing.

Intersection spacing standards shall be applied, as development occurs, to preserve desirable location and alignment of streets to serve future growth and provide an efficient overall transportation system.

A. The following presents recommended cross street and signal spacing standards.

Recommended Street, Intersection and Signal Spacing (feet)

Street Type	**Maximum** Through Street	**Minimum Intersection Spacing (feet)** Signalized	Unsignalized
Major	5,280	2,640	1,320
Collector	2,640	1,320	880
Local	1,320	NA	440
Access or	880	NA	440

B. On the advice of the municipal engineer, the Joint Planning Board may raise or lower the required intersection spacing standards based on posted or operational speeds in the vicinity of the proposed site, the type and character of the development proposed to be served, and the impact of projected traffic generation on the area street network.

§ 150-132. Nonconforming access.

Access connections in place prior to the e5ec-6ve date o£ these regulations which do not conform to the requirements of these regulations shall be treated as pre-existing nonconforming access features which are allowed to continue subject to the standards of Article VIII, especially §150-70 B. regarding discontinuation and the following.

A. The feasibility of bringing nonconforming access connections into compliance shall be evaluated under the following conditions:

1. When a new driveway access permit is requested.
2. When proposed changes increase the square footage of a building or accessory use by 10 percent or more, or make an investment that substantially increases traffic generation.
3. When the proposed changes increase the peak hour or daily site generated traffic by 50 or more peak hour trips.
4. In conjunction with state or county improvement projects.

B. At the direction of the Joint Planning Board in consultation with the municipal engineer, the evaluation may be required to address the feasibility of the following:

1. Elimination and/or consolidation of access connections.
2. Realignment or relocation of access connections.
3. Provision of shared driveways or cross access.
4. Provision of rear access.
5. Restriction of vehicle turning movements.
6. Changes in the layout of on-site parking and circulation.
7. Traffic demand management.

C. The objective of the feasibility evaluation is to make recommendations to improve operational and safety characteristics of the access connection by bringing the number, location, spacing, and design of access connections into conformance with these regulations.

D. Existing driveway spacing along major and collector streets in developed portions of the Village of Livonia and the hamlets of Hemlock, Lakeville, Livonia Center, South Lima, and South

Livonia is as low as 50 to 100 feet. Such buildings are not expected to accommodate uses that generate more than 150 peace hour trips. Driveway spacing standards for expansion, change of use or intensification of use for buildings in these areas shall target driveway spacing of 125 feet if the posted speed is 35 mph or less and 220 feet if the posted speed limit is more than 35 mph. Peak hour trip generation above 150 may be appropriate if the driveway spacing standards of §150-129 can be met.

D. The Joint Planning Board may require implementation of access changes that will improve traffic operations, safety, or overall access.

§ 150-1.33. Design of driveways and internal circulation.

A. Driveways and on-site circulation shall be designed so as to provide for the safe and efficient movement of traffic between the roadway and the site, and to eliminate the potential for the queuing of vehicles along, the roadway due to congestion in or at the driveway.

B. Driveway location, width, radii, flare, throat length, and other elements of the circulation system for developments generating more than 150 peak hour trips shall be based upon consultation with qualified traffic, engineering and design professionals. Alternatively, the Joint Planning Board may retain such a professional to review the design at the cost of the applicant.

§ 150-134. Required mitigation of traffic impacts.

A. Any proposed residential subdivision or non-residential development projected to generate more than 150 trips during any weekday or weekend peak hour may be required to mitigate the traffic impacts of such new development. Required mitigation shall be recommended by a qualified traffic engineer based on the assumptions and analyses included in a comprehensive traffic study completed in accordance with the procedures of the State Environmental Quality Act.

B. Required mitigation may include but shall not be limited to the installation of signals, turning lanes, or medians, the

use of shared driveways, cross access, or the construction of access or development streets, and/or other traffic demand management strategies.

C. Phased mitigation may be allowed where phased development is proposed.

§ 150-135. Standards for estimating peak hour generation.

A. The standards and methodologies for estimating Peak Hour Trip Generation shall be as follows:

1. Trip generation rates shall be determined through application of the most recent Institute of Transportation Engineers Trip Generation methods and statistics.

2. Trip generation shall be based on full build-out of the proposed parcel and/or abutting parcels.

3. Peak Hour Trip generation shall be the peak hour of the proposed use or the adjacent street, whichever is greater.

B. The following are examples o£ developments which would generate approximately 150 Peak Hour Trips.

Use	Size	Peak Hour Trips Generated
Single Family	157 dwellings	150 Saturday peak hour trips
Low Rise Apartments	268 dwellings	150 Saturday peak hour trips
General Office	75,900 square feet	150 weekday a.m. peak hour trips
Medical Office	34,400 square feet	150 weekday p.m. peak hour trips
Industrial Park	124,000 square feet	150 weekday p.m. peak hour trips
Shopping Center	6,700 square feet	150 Saturday peak hour trips

FORT EDWARD

SITE PLAN REVIEW

§ 87-48. Lots. A. Arrangement. The arrangement of lots shall be such that there will be no foreseeable difficulties for reasons of topography or other conditions in locating a building on each lot and in providing access to buildings on such lots from an approved street. All lots shall be numbered by the system used by the Assessor of the Town of Fort Edward.

B. Access across watercourses. Where a watercourse separates the buildable area of a lot from the access street, provisions shall be made for the installation of a culvert or other structure, of a design approved by the Town Engineer or a duly designated town official. Nothing in this section shall conflict or supersede provisions of the New York State Freshwater Wetlands Act, Editor's Note: See § 24-0101 et seq. of the Environmental Conservation Law. if applicable.

C. Side lot lines. Side lot lines shall be at right angles or radial to the street lines unless a variation from this rule will give a better street or lot plan.

D. Access from major streets. Lots shall not, in general, derive access exclusively from a major street Where driveway access from a major street may be necessary for several adjoining lots, the Planning Board may require that such lots be served by a combined access drive in order to limit possible traffic hazard on such street.

ZONING ORDINANCE

Location of exits and entrances. No gasoline filling station or commercial parking areas or garage for 25 or more motor vehicles shall have an entrance or exit for vehicles within 200 feet along the same side of a street on which is located a school, public playground, church, hospital, public library or institution for dependents or for children, except where such property is in another block or on another street on which the lot does not abut. Such access shall be not closer to the intersection of any two streets than 50 feet.

EAST FISHKILL

§ 194-67.1. Shared driveways. [Added 11-14-2002 by L.L. No. 9-2002] A. Authority of the Planning Board. Authorization is hereby granted to the Planning Board, Town of East Fishkill, to permit shared driveways in all residential zones by special permit, provided that the Board finds that the application meets all the general conditions of Article IX (Special Permits) and further meets all of the applicable conditions set forth in this section.

B. Purposes. (1) Shared driveways reduce the number of curb cuts along the street, improving access management and reducing the number of potential intersections and turning movements.

(2) Shared driveways can reduce adverse impacts to environmentally sensitive lands.

C. Standards. (1) Maximum number of lots. The maximum number of lots sharing a driveway shall be three.

(2) Minimum area of each lot (not including any portion of shared driveway): 1.5 acres.

(3) Width. The width of the traveled way of the shared portion of the driveway shall be 16 feet with a two-foot cleared shoulder on each side.

(4) Length. The shared portion of the driveway shall in no event be longer than 1/4 mile.

(5) Agreements for construction and maintenance. Appropriate legal agreements/declarations shall be provided to assure proper construction and maintenance of the driveway.

(6) Buffering/Screening. Where appropriate, the Board may require additional screening or buffering to insure privacy to lots.

(7) Shared driveways shall be constructed to the standards of the driveway specifications in the Town Highway Specifications (presently § A197-76).

HARTFORD

§5 Site access standards: Site plan approval shall be conditional upon the applicant(s) obtaining any necessary curb-cut permits. In addition, site plans should comply (if applicable) with following site access guidelines:

a. Access drives shall be constructed and maintained so as to provide for year-round access;

b. In cases where sites have frontage on more than one (1) road, the principal point of access shall be from the secondary road (whenever feasible);

c. Driveways shall be combined (whenever feasible) to minimize the number of access points onto roadways;

d. There shall be a maximum to two (2) driveway entrances per developed lot;

e. No driveway centerline shall intersect a streetline less than seventy (70) feet from the intersection of any two (2) roadways;

f. Driveway grade and width shall be such that adequate and safe access is provided for emergency and service vehicles during all seasons.

GREENWICH

SUBDIVISION REGULATIONS

Section 2: Street Layout

D. Special Treatment Along Major Arterial Streets When a subdivision abuts or contains an existing or proposed major arterial street, the Board may require marginal access streets, reverse frontage with screen planting contained in a non-access reservation along the rear property line, deep lots with service alleys, or such other treatment as may be necessary for adequate protection of residential properties and to afford separation of through and local traffic. E. Provision for Future Re-subdivision Where a tract is subdivided into lots substantially larger than the minimum size required in the zoning district in which a subdivision is located, the Board may require that streets and lots be laid out so as to permit future re-subdivision in accordance with the requirements contained in these regulations. F. Dead-End Streets The creation of dead-end or loop residential streets will be encouraged wherever the Board finds that such type of development will not interfere with normal traffic circulation in the area. In the case of dead-end streets, where needed or desirable, the Board may require the reservation of a 20-foot wide easement to provide for the continuation of pedestrian traffic and utilities to the next street. Subdivisions containing twenty (20) lots or more shall have at least two street connections with existing public streets, or streets shown on the Official Map, if such exists, or streets on an approved Subdivision Plat for which a bond has been filed. G. Block Size Blocks generally shall not be less than 400 feet nor more than 1200 feet in length. In general, no block width shall be less than twice the normal lot depth. In blocks exceeding 800 feet in length, the Planning board may require the reservation of a 20-foot wide easement through the block to provide for the crossing of underground utilities and pedestrian traffic where needed or desirable and may further specify, at its discretion, that a 4-foot sidewalk be included. H. Intersections with Collector or Major Arterial Roads Minor or secondary street openings into such roads shall, in general, be at least 500 feet apart. I. Street Jogs Street jogs with center- line offsets of less than 125 feet shall be avoided. J. Angle of Intersection In general, all streets shall join each other so that for a distance of at least 100 feet the street is approximately at right angles to the street it joins. K. Relation to Topography The street plan of a proposed subdivision shall bear a logical relationship to the topography of the property, and all streets shall be arranged so as to obtain as many of the building sites as possible at or above the grade of the streets. Grades of streets shall conform as closely as possible at the original topography. L. Other Required Streets Where a subdivision borders on or contains a railroad right-of-way or limited access highway right-of-way, the Planning Board may require a street approximately parallel to and on each side of such right-of-way, at a distance suitable for the appropriate use of the intervening land (as for park purposes in residential districts, or for commercial or industrial purposes in appropriate districts). Such distances shall also be determined with due regard for the requirements of approach grades and future grade separations.

Section 5: Lots

E. Access The Subdividing of land shall be such as to provide, by means of a public street, each lot with satisfactory deeded access in fee, to an existing public street. When not indicated on the Master Plan or Official Map, if such exists, the determination of sufficient access shall be made by the Board. Access from private streets shall be deemed acceptable only if such streets are designed and improved in accordance with these regulations. All private streets shall conform to all state standards and regulations.

SITE PLAN REGULATION

Article D: Design Standards

c. Access Standards Site plan approval shall be conditional upon the applicant obtaining any necessary highway work permits from the jurisdictional permitting authority (state, county, or town highway departments). In addition, the following access requirements shall apply: 1. Access drives shall be constructed and maintained so as to provide year-round access. 2. In cases where sites have frontage on more than one road, the principal point of access shall be from the more secondary road wherever feasible. 3. There shall be a minimum distance of thirty-five (35) feet between proposed and existing driveways on public roads. 4. Driveways shall be combined wherever possible to minimize the number of access points onto public roadways. 5. There shall be a maximum of two (2) driveway entrances per developed lot. 6. No driveway centerline shall intersect a road less than seventy (70) feet from the intersection of any two (2) roadways. 7. Driveway grade, width, and sight distance shall be such that adequate and safe access is provided for emergency and service vehicles during all seasons. 8. The minimum maintained width of driveways shall be eighteen (18) feet, which allows for ingoing and outgoing vehicles to pass one another safely. 9. Driveways shall be ninety (90) degrees to the road. 10. Maximum grade of access drives shall be eight percent (8%) except for the first fifty (50) feet from an intersection, which shall have a maximum grade of four percent (4%). The maximum grade for parking areas shall be four percent (4%).

4. Traffic and On-Site Circulation a. General Standards 4. In order to minimize turning movements onto or from public roadways and adjacent sites, the Planning Board shall encourage the interconnection of parking areas, where feasible, via access drives within and between the adjacent commercial uses. Site plans should demonstrate a layout, which would permit future connections, if appropriate.

TOWN OF SALEM

SITE PLAN REVIEW

4.024 Driveways

The Town Highway Superintendent shall review and approve the location and placement of any new driveway that enters upon a town road.

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12. Commercial strips should be along major arteries with maximum protection to surrounding residential areas. Common driveways, shared parking area, sign control and green spaces in front of the buildings should be encouraged.

VILLAGE OF SALEM

ZONING LAWS

5.23 The proposed Special Use shall provide safe, convenient and adequate vehicular and pedestrian access to and from the use through the provision of adequate but not excessive points of ingress and egress which are of sufficient width, properly graded and aligned, provide clear visibility, and are not located too near street corners or places of public assembly.

5.41 Automobile Service Stations

a. The following minimum distance requirements shall be adhered to: 12' from pump island to any lot line; 20' from building to each side lot line; at least l,000' distance shall be maintained between automobile service stations (this distance shall be measured along or across the street frontage unless intersected by a street, distance to be measured from lot lines); minimum distance 500' in any direction from place of public assembly (including schools, churches, parks, theater, etc.); access drives from the street frontage shall not be less than 20' from any property corner, and not wider than 50; no access drive shall be closer than 10' to any lot line; a minimum of 300' of distance to a residential district where the residential district fronts on the same street as the automobile service station, or faces the automobile service station, and in any other case, such distance shall not be less than 200' from the nearest lot line of the automobile service station.

QUEENSBURY

§ 179-18-030. Planning Board authority regarding Class A Regional Projects.

A. The Planning Board is hereby designated to consult with the Adirondack Park Agency with regard to Agency review of Class A Regional Projects.

B. As soon as reasonably practicable following receipt by the Planning Board from the Adirondack Park Agency of notice of application completion with regard to a Class A Regional Project, the Planning Board or one or more designees thereof shall consult with the Agency for the purpose of analyzing the project application and formulating advisory recommendations as to whether the project meets all of the pertinent requirements and conditions of the Town Land Use Plan.

C. Not later than 30 days following receipt by the Planning Board from the Agency of notice of application completion with regard to a Class A Regional Project, the Planning Board shall notify the Agency whether the project meets the pertinent requirements of the Town Land Use Plan.

§ 179-18-040. Class A Regional Projects.

Refer to the appendices for a list of Class A Regional Projects.[36]

§ 179-18-050. Class B Regional Projects.

Refer to the appendices for a list of Class B Regional Projects.[37]

§ 179-18-060. Regional project Review Criteria.

Refer to the appendices for a list of the regional project review criteria.[38]

ARTICLE 19
Access Management

§ 179-19-010. Commercial driveway standards.

A. Purpose. The Town of Queensbury recognizes that one of the most important objectives of access management is to reduce conflicts along the most heavily traveled roadways to achieve safe and efficient movement of traffic. Conflict points can be reduced through appropriate limitations on the number of driveways, driveway spacing, and by establishing provisions for vehicles to move between parking areas to access abutting properties.

B. General.

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36 Editor's Note: See § 179-21-010.

37 Editor's Note: See § 179-21-020.

38 Editor's Note: See § 179-21-030.

(1) The site layout, location and design of driveways, parking, and other access management requirements should be based on full permissible development of a property.

(2) Driveways should be limited to one per property. More than one driveway may be permitted if:

(a) The additional driveway(s) does not degrade traffic operations and safety on state or local roads; and

(b) The additional driveway(s) will improve the safe and efficient movement of traffic between the property and the road.

(3) Driveways to properties with frontage on two or more roads shall be provided to the road with the lowest functional classification serving the proposed use of the property.

(4) Properties with frontage on two or more roads do not have the right to driveways to all roads.

(5) Driveways may be required to be located so as to provide shared driveways and/or cross-access driveways with an abutting property or properties.

(a) Shared driveways and/or cross access driveways shall be of sufficient width (minimum 20 feet, 6.0 meters) to accommodate two-way travel for automobiles and service and loading vehicles. Wider driveways may be required to serve traffic to major generators and/or large vehicles.

(b) Shared driveways, cross-access driveways, interconnected parking, and private roads constructed to provide access to properties internal to a subdivision shall be recorded as an easement and shall constitute a covenant running with the land. Operating and maintenance agreements for these facilities shall be recorded with the deed.

C. Driveway spacing standards.

(1) Driveway spacing standards shall apply to driveways located on the same side of a road.

(2) Driveway spacing is to be measured along the road from the closest edge or curbline of the driveway pavement to the closest edge or curbline of the next driveway.

(3) Driveways shall be located so as to meet or exceed the driveway spacing standards shown in the chart below:

Development Size in Peak Hour Trips, PHT

Road Classification	**Small 0 to 100 PHT**	**Moderate 101 to 300 PHT**	**Large > 300 PHT**
Arterial	330 feet	440 feet	550 feet
Collector	220 feet	330 feet	440 feet
Access or development	60% of the minimum frontage requirement		

(a) PHT, peak hour trips, will be determined through the application of the most current Institute of Transportation Engineers (ITE) trip generation methods and statistics.

(b) PHT, peak hour trips, should be based on full build-out of the property.

(c) The larger of the minimum driveway spacing standards for the proposed development or for existing developments at abutting properties will apply. Driveways for infill development must meet the driveway spacing standards to abutting properties on both sides.

(d) The Planning Board may waive the separation standards in the event the applicant can demonstrate that no negative impact on the transportation system will result in the relaxing of this standard and the applicant has provided for future consolidation of curb cuts and cross-easments consistent with the intent of these regulations.

D. Other guidance. The Planning Board shall utilize the NYSDOT Policy and Standards for Entrances to State Highways (February 1998) or its most current version as a guide in establishing other criteria for commercial development.

§ 179-19-020. Residential lots abutting collector or arterial roads.

A. Purpose. The Town of Queensbury realizes that unrestricted access onto arterial and collector roads can hinder the safe and efficient movement of traffic. Subdivisions, especially small subdivisions, have tended to provide direct access onto these roadways from each single-family lot. Lots fronting on local roads rather than arterials or collector roads shall be encouraged, while lots fronting on collector or arterial roads shall be discouraged.

B. Designated roads. The following streets, roads and routes have been designated as regional or local arterial roads or collector roads. Land fronting on these roads shall comply with the requirements of this section.

(1) Regional arterial roads:

(a) Corinth Road.

(b) Main Street.

(c) Aviation Road from I-87 east to Route 9.

(d) Quaker Road.

(e) Dix Avenue.

(f) Ridge Road from Quaker Road north to Route 149.

(g) Route 149.

(h) Route 9.

(i) Bay Road.

(2) Local arterial roads:

(a) West Mountain Road.

(b) Mountain View Lane.

(c) Aviation Road from West Mountain Road east to I-87.

(d) Potter Road.

(e) East Shore Drive.

(f) Ridge Road from Route 149 north to East Shore Drive.

(g) Ridge Road from Glens Falls north to Quaker Road.

(h) Country Club Road.

(i) County Line Road.

(j) Highland Avenue.

(k) Lower Warren Street.

(l) River Street.

(m) Hicks Road.

(n) Glenwood Avenue.

(o) Round Pond Road/Blind Rock Road.

(p) Haviland Road.

(3) Collector roads:

(a) Pitcher Road.

(b) Luzerne Road.

(c) Sherman Avenue.

(d) Peggy Ann Road.

(e) Dixon Road.

(f) Park View Avenue.

(g) Cronin Road.

(h) Sweet Road.

(i) Glen Lake Road.

(j) Martindale Road.

(k) Moon Hill Road.

(l) Sunny Side Road.

(m) Sunny Side Road East.

(n) Pickle Hill Road.

(o) Van Dusen Road.

(p) Richardson Street.

(q) Meadowbrook Road.

(r) Rockwell Road.

(s) Gurney Lane Road.

(t) Jenkinsville Road.

(u) Pilot Knob Road.

C. Regulations. As of the effective date of this chapter, all residential lots fronting on a collector or arterial road identified herein or any new collector or arterial roads shall have two times the lot width permitted in the zone in which the lot is located, except that this requirement shall not apply under circumstances where adjoining residential lots exist or are proposed to be established and the width of each lot meets the required width of the zone and ingress or egress is limited to and provided by a single common driveway, which is documented on a plat and in a written legal document, which is recordable in the Warren County Clerk's office.

ARTICLE 20
General Exceptions

§ 179-20-010. General exception to minimum lot requirements.

This Zoning Chapter as it was revised on October 1, 1988, set forth many new requirements concerning lot area, size, dimensions and setbacks. This section exempts certain lots from the requirements of this chapter as it currently exists and as it existed since October 1, 1988, as follows:

A. Any lot of record lawful existing and complying with the Town of Queensbury Zoning Ordinance on the day prior to the adoption of the October 1, 1988, amendment to the Town Zoning Ordinance that does not conform to this chapter as it exists on and after October 1, 1988 ("nonconforming lot of record"), will be deemed as conforming to required area and/or minimum lot width requirements of this chapter.

B. Development of any nonconforming lots of record which are located within Planning Board approved subdivisions shall be considered as complying with the setback requirements of this chapter if the setback requirements applicable at the time the subdivision was approved are met.

C. Development of any nonconforming lots of record existing outside of subdivisions shall comply with the setback requirements of this chapter unless the Zoning Board of Appeals grants a variance.

D. Other than as set forth herein, nonconforming lots of record shall comply with all other requirements of this chapter.

ACCESS PERMITS IN THE A/GFTC REGION

Permitting of projects in the A/GFTC region follows one of three tracts depending on the location and desired access of the project. If access is desired from a local roadway the entire permitting process falls within town purview though the town may consult with state or county officials. If access is desired onto a county roadway, the applicant must apply to the local municipality for required local permits and also make application to the county for permission to work in the right of way. If access is desired onto a state roadway, the applicant must apply to the local municipality for local development permits and must participate in the State Environmental Quality Review Act (SEQR) process.

LOCAL ACCESS PERMITS

An individual seeking access to a locally owned street or road needs to conform to regulations and guidelines in municipal codes and will need to obtain a driveway permit.

Municipal codes often include guidelines and standards related to the location and design of driveways. These guidelines and regulations are typically incorporated into subdivision regulations and zoning ordinances. The regulations sometimes include specific articles or sections that focus on access management. Examples of local access management guidelines and requirements are included in Section 4.

Municipal subdivision and zoning regulations apply to driveways on local, county, and state roadways. Applicants should always review these local documents before making final decisions on the location and design of driveways, even if their property does not access a local road.

The means used to regulate access at the local level can be placed into three general categories. The first category includes municipal regulations with specific language modeled after the sample regulations provided by NYSDOT (also included in Section 4 of this guidebook). The second general category includes municipal regulations with general language that supports the overall goals of access management but specific design guidelines or standards are not included. In the third category, municipal land use codes provide no guidelines or standards on access management. Regardless, an individual seeking a new access or changes to an existing access should review municipal codes for any requirements.

For projects that seek access on a local roadway, a driveway work permit is usually required. The permit form is often quite simple and can be obtained from the municipal highway department. An example from Queensbury is provided at the end of this section.

COUNTY PERMITTING

The A/GFTC region includes municipalities that are part of three different counties – Saratoga, Warren and Washington. In general, all counties require right-of-way work permits which are primarily administrative and trigger some level of review which may include sight distance, drainage

sufficiency, and impacts on county roads including access management impacts. Access permit requirements for each county are described below.

Saratoga County

In Saratoga County, no formal access management policy guides permitting although recently the County has developed a white paper in support of and describing best practices for shared driveways. These shared driveways are generally meant for residential land uses. Residential developments with greater than 20 or 25 lots require 2 access points from a public health (i.e. emergency) access standpoint. Commercial developments generally can have 2 access points onto a county road though larger developments can negotiate more curb cuts and rely significantly on the work of Professional Engineers hired by the land developers.

For access to a county road, an application to work in the right of way must be submitted to Saratoga County (a copy of the application is included as an appendix to this section). In general the County's primary concern is maintaining safe access with sufficient sight distances and adequate drainage. Although Saratoga County has no formal access management policy, concerns will be raised if a stretch of roadway is being impacted by frequent curb cuts.

The County is responsible for negotiating appropriate access to county roads but municipalities are responsible for land use permitting. Local access management guidelines or standards will therefore also apply and must be considered by applicants. Saratoga County recommends obtaining the driveway work permit before beginning the local development review process.

Warren County

Warren County has two primary guidelines for access to county roadways. The first – *The Policy & Standards for Entrances to County Roads*, adopted in 1962 by the County – is still in use for low volume rural roads. A copy is contained in the appendix to this section.

The second is the NYSDOT Policy and Standards, which was adopted as the county standard by the Board of Supervisors in 2003 (the resolution is contained in the appendix). The NYSDOT standards are applied on the more urban County roadways. The NYSDOT standards require applicants to study the immediate and off-site traffic impacts, including safety and capacity, of the proposed project. In terms of access management, the document provides standards for driveway spacing, limits the number of access points generally to one (a second one may be permitted with "sufficient frontage and extenuating circumstances"), limits median openings on divided highways, and allows for driveway channelization, as beneficial. In addition, the document states that if a property fronts both a State highway and another roadway, NYSDOT may require access onto the secondary roadway only.

Warren County also has a permit to work in their right of way, available as an appendix to this section.

Washington County

Washington County has a permit to work in the right of way, also available as an appendix but does not limit access to county roads except to ensure optimum sight distances.

STATE PERMITS

Access to state roadways is regulated by the SEQR process, requires a Highway Work Permit, and must satisfy the NYSDOT Policy and Standards for the Design of Entrances to State Highways.

SEQR Process

The SEQR process is designed to coordinate the various permitting steps and ensure adequate environmental review of proposed projects or actions. Figure 1 on the following page illustrates the overall SEQR process. A Highway Work Permit will not be issued until the SEQR process is completed but, because NYSDOT may ask for modifications to the proposed access, NYSDOT should be included early in the process (Step 3 – Coordinate Review). This early review will help avoid making changes to access that could affect on-site circulation, parking, and possibly the layout and location of buildings and other structures.

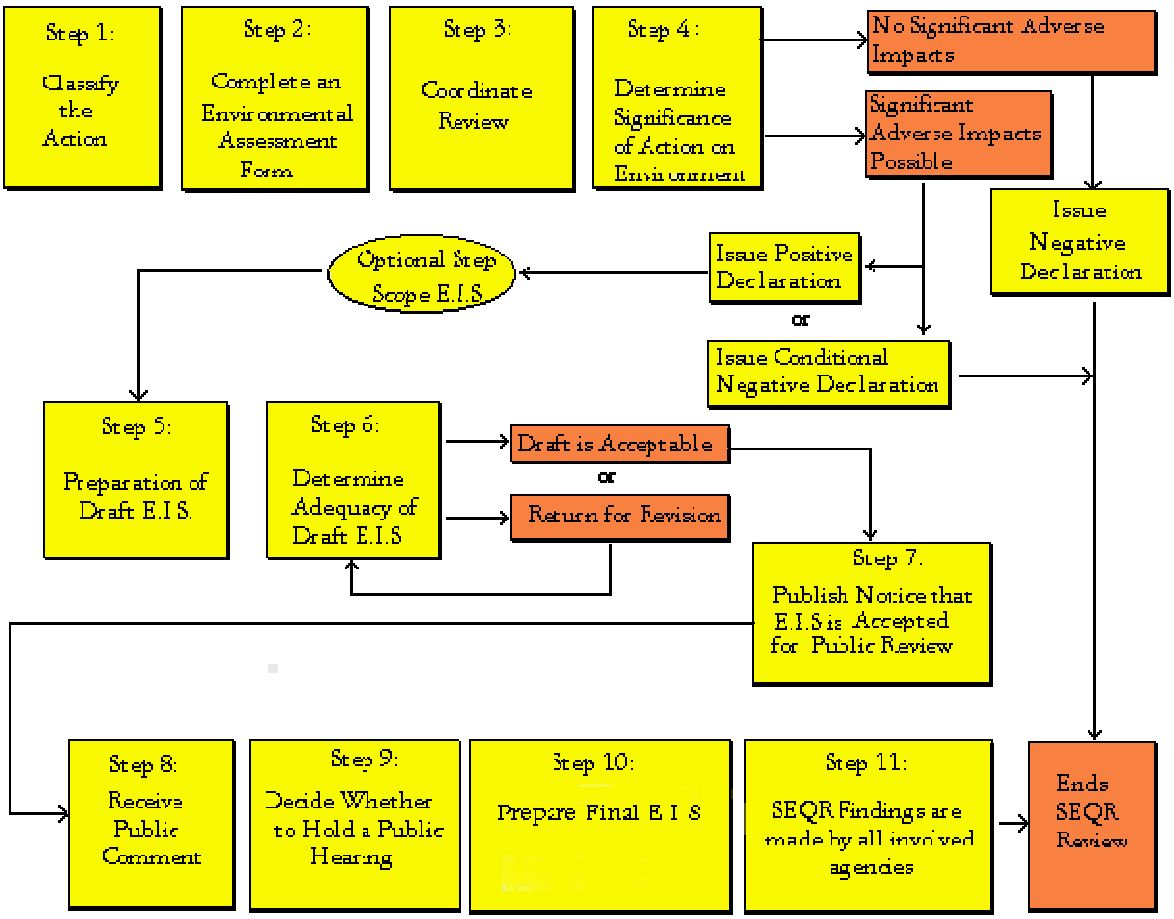
Highway Work Permits

Applicants for curb cuts must complete PERM 33 – Highway Work Permit Application for Non-Utility Work. Applicants for residential projects must also fill out the Residential Driveway Form to supplement PERM 33. Both permits are available in the appendix to this section.

NYSDOT Access Management Policies

As outlined above in the Warren County section, the NYSDOT Policy and Standards provide guidelines supporting access management techniques including standards for driveway spacing, limits on the number of access points generally to one, limits on median openings on divided highways, and allowances for driveway channelization, as beneficial. In addition, the document states that if a property fronts both a State highway and another roadway, NYSDOT may require access onto the secondary roadway only.

Figure 1: Map of SEQR Process[1]



[1] Source: http://www.dec.state.ny.us/website/dcs/seqr/1seqrmap.html

APPENDIX

Highway Work Permit Applications

Town of Queensbury
Highway Department
742 Bay Road - Queensbury, NY 12804
Office Phone: (518) 761-8211
Fax: (518) 745-4466

Richard A. Missita
Highway Superintendent
Home (518) 798-5127

Michael F. Travis
Deputy Highway Superintendent
Home (518) 798-0413

www.queensbury.net

DRIVEWAY PERMIT

DATE: _____

APPLICANT NAME: _____

TELEPHONE NO.: _____

ADDRESS TO BE INSPECTED: _____

RETURN ADDRESS: _____

Applicant must show exact location and width of driveway(s) to be connected to the highway by placing stakes at the specified location.

The Superintendent of Highways of the Town of Queensbury has reviewed this application. The following action has been taken:

STEP 1: ( ) Preliminary Approval

NEED:
( ) Slight swale
( ) Deep swale
( ) Level with the road
( ) Level with the wing

Size culvert pipe to be used (if necessary)
( )12" ( )15" ( )18" ( )24" ( )36"

Preliminary inspection completed by:_____Date:_____

Approval by Highway Supt:_____Deputy Supt:_____

Upon completion, please resubmit this approved permit for a final approval.

STEP 2: ( ) Final Approval
( ) Rejected

Date:_____

_____
Richard A. Missita, Highway Superintendent

_____
Michael F. Travis, Deputy Highway Superintendent

SARATOGA COUNTY DEPARTMENT OF PUBLIC WORKS

SARATOGA COUNTY PUBLIC WORKS FACILITY
3654 GALWAY ROAD
BALLSTON SPA, NEW YORK 12020-2517

JOSEPH C. RITCHEY, P.E., COMMISSIONER
(518) 885-2238 or 885-0687
FAX (518) 885-6909

PERMIT FOR CONSTRUCTION OF A DRIVEWAY

Application is hereby made for a permit pursuant to Section 136 of the Highway Law to construct a driveway connection within the Right of Way of a County Highway. Approval of this permit is contingent on the approval of all other agencies involved with this project.

APPLICANT: NAME: _____ PHONE NO.: _____

ADDRESS: _____

_____

LOCATION: COUNTY ROAD NO.: _____ ROAD NAME: _____

TOWN: _____

SIDE OF ROAD: (N) (S) (E) (W)

MAP NO.: _____ BLOCK NO.: _____ LOT NO.: _____

_____ FEET and/or _____ MILES (N) (S) (E) (W)

FROM: _____

NUMBER OF DRIVEWAYS REQUESTED, WIDTH: _____

GENERAL REQUIREMENTS:

The construction shall be in accordance with the requirements listed herein on plan "STANDARD DRIVEWAY DITCH CROSSING" and all special requirements shown on or attached to the "PERMIT".

The applicant shall furnish all materials and bear all costs of construction within the County Highway Right of Way and all work done and materials used shall meet the requirements of the Saratoga County Department of Public Works.

No alteration or addition shall be made to any driveway without first securing a new permit from the County.

GENERAL REQUIREMENTS CONTINUED:

4. The angle of the driveway with respect to the highway pavement edge shall not be less than 60° or more than 120°.

5. No driveway will be permitted within 50 ft. of an intersection.

6. No new driveway will be permitted at a location where the lack of sight distance in either direction along the highway is a hazard.

7. Residential driveway entrance shall be a maximum of 20 feet wide.

8. Commercial driveways shall be a maximum of 50 feet wide for a single combined entrance and exit, or a maximum of 50 feet each when two separate entrances are permitted. No more than two entrances from one highway to a single commercial establishment shall be permitted. Application for a commercial entrance shall include a fully dimensioned plan of the proposed driveway showing drainage.

DRIVEWAY CONSTRUCTION PERMIT
SARATOGA COUNTY DEPARTMENT OF PUBLIC WORKS

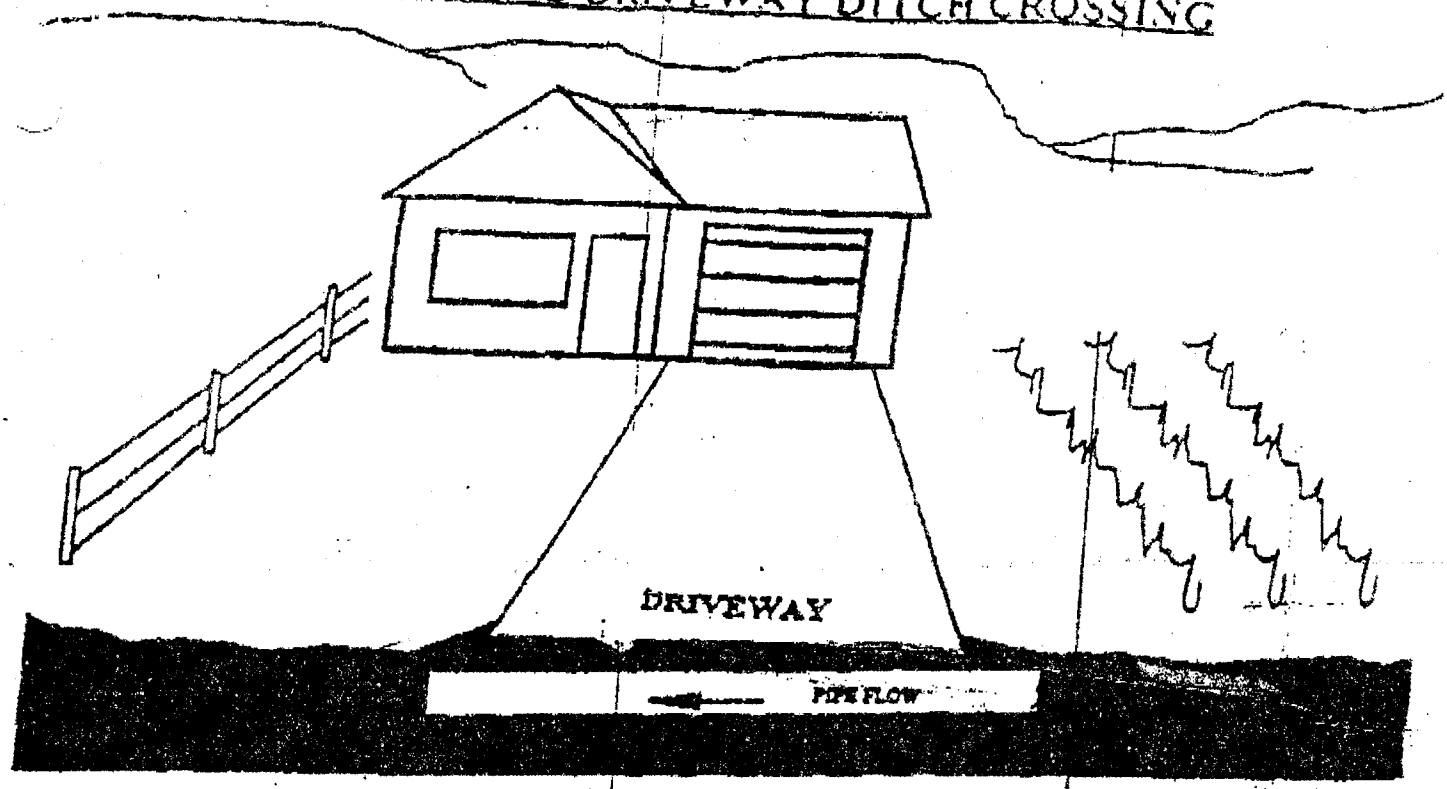
'ermission is hereby granted to the above applicant to construct a driveway ditch crossing at the location escribed above in full conformance with the requirements set forth herein and attached hereto (attachments esignated) _____

...E: _____ _____

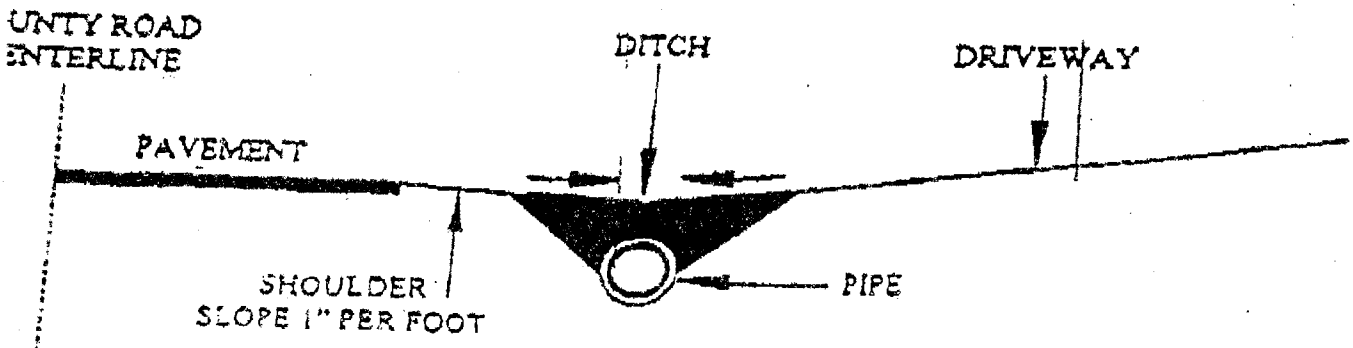
(signature of approving authority)

)TE: A stake with flagging must be placed at the proposed driveway entrance to identify the location for inspection.

STANDARD DRIVEWAY DITCH CROSSING



1. Pipe must be not less than 12 inches inside diameter with a maximum length of 20 ft. and be of either reinforced concrete, corrugated metal or High Density smooth interior corrugated polyethylene pipe. (No substitutes)
2. Pipe shall be placed so that inside flow line of pipe is at bottom of ditch and sloped true to ditch grade, maintaining free and unobstructed flow.
3. Highway shoulder must not be altered.
4. Any rise in driveway shall occur on the backslope of ditch line so that drainage from driveway will flow into the ditch and not into the highway.



CROSS SECTION

WARREN COUNTY DEPARTMENT OF PUBLIC WORKS

PERMIT TO WORK IN COUNTY RIGHT-OF-WAY

(Under Article 6, Section 136 ET.AL. of Highway Law)

Warrensburg Offices
4028 Main Street
Warrensburg, NY 12885
518-761-6556 or 518-623-4141
fax 518-623-2772

William Remington, P.E.
Superintendent of Public Works

William E. Lamy, P.E.
Deputy Superintendent of Public Works

Insurance Policy #: _____ County Road #: _____

Expiration Date: _____ Permit #: _____ Expiration Date: _____

WHEREAS, A County Road # _____ known as _____ is part of the County Road System and

WHEREAS, _____ whose address is _____, whose telephone number is _____ requests permission to _____

_____

_____

NOW, THEREFORE, permission is granted to the applicant to do said work subject to the following conditions:

A (Certified Check) (Bond) in the sum of $ _____, payable to the County Treasurer of Warren County is (On File) (To Be Deposited) as security that the highway will be restored to its original condition where disturbed at the expense of the applicant, as soon as the work has been completed, and the said County Superintendent of Public Works is hereby authorized to expend all or as much of such deposit as may be necessary for that purpose, should the said applicant neglect or refuse to perform the work.

SPECIAL CONDITIONS

_____

_____

_____

_____

In consideration of granting this permit the undersigned accepts it subject to conditions described.

_____	_____	_____
Property Owner	Date	County Superintendent of Public Works
_____	_____	_____
Contractor	Date	Date

IMPORTANT NOTICE: Carefully read and fully comply with the following conditions. No work affecting the roots or tops of trees is authorized by this permit, excepting those permits issued for this purpose. Guying to trees requires written permission. To avoid damage to power and communication lines and cables, gas mains, water mains, etc., permittee shall contact the owners thereof and obtain their permission before starting work. It is mandatory to notify the person or municipality distributing gas in that area at least 72 hours in advance before discharging explosives. Conduct operations safely. Prevent accidents. See conditions on reverse side of this permit.

1. The privilege granted by the permit does not authorize any infringement of Federal, State, or local laws or regulations, and is limited to the extent of the authority of this Department in the premises. Such permit shall not be assigned or transferred without the written consent of the Superintendent of Public Works.
2. The work authorized by the permit shall be performed under the supervision and to the satisfaction of the Superintendent of Public Works or his representatives.
3. The Superintendent of Public Works shall be given one week=s notice by the permittee of the date when he intends to begin the work authorized by the permit, and prompt notice of its completion.
4. The permittee shall be responsible for all damages resulting in bodily injury, including death, and/or property damage liability due to the installation, maintenance, use or existence of any facility of the permittee or which arises out of the activities of the permittee, its contractors sub-contractors of either or both, agents or employees in connection with any act or omission hereunder; and does hereby expressly agree to indemnify and save harmless the County and/or the Department of Public Works and/or the Superintendent of Public Works and his representatives and employees from claims, suits, actions, damages and costs of every name and description, arising out of or resulting from any act or omission hereunder, and does hereby further expressly agree to pay any damages because of injury to or destruction of part or all of any bridge, or other structure owned by the County of Warren, and caused directly or indirectly by any occurrence and arising out of the existence, maintenance or use of any facility or the matter and contents thereof as such facility, matter and contents are authorized for installation, connection, maintenance, transportation, or transmission on and across any such bridge, or other structure, pursuant to the terms of the permit.
5. Unless expressly waived by the Superintendent of Public Works, the permittee shall furnish with the application policy of protective liability insurance issued to and covering the liability of The People of the County of Warren and/or the Superintendent of Public Works of the County of Warren, with respect to all operations under the permit by the permittee or by anyone acting by, through or for the permittee, including omissions and supervisory acts of the County. The limit of liability in such policy shall be not less than $1,000,000.00 for all damages arising out of bodily injury, including death at any time resulting therefrom, sustained by one person in any one accident and. subject to that limit for each person, not less than $3,000,000.00 for all damages arising out of bodily injury, including death at any time resulting therefrom, sustained by two or more persons in any one accident , and subject to that limit per accident, not less than $3,000,000.00 for all damages arising out of injury to or destruction of property during the policy period. Such policy shall state that it will not be changed or canceled until ten days= written notice has been given to said Superintendent of Public Works and acknowledged.
6. The enumeration in the permit of the kind and amount of insurance shall not abridge, diminish, or affect the permittee=s legal responsibilities for the consequences of accident arising out of or resulting from the operations of the permittee under the permit.
7. Any undertaking, bond or certified check required by and deposited with the Department of Public Works before or at the time of the issuance of the permit by the Superintendent of Public Works shall be deemed to include and be used as security that the highway or any part thereof will be restored to its original condition where disturbed, at the expense of the permittee, as soon as the work has been completed and the said Superintendent of Public Works is hereby authorized to expend all or as much of such deposit as may be necessary for that purpose, should the said permittee neglect or refuse to perform the work.
8. It shall be deemed the responsibility of the permittee for the payment of any and all claims for the damages arising out of operations by this permit which may result because of any dangerous conditions created by the existence of any debris or obstruction left on the pavement or roadside during the progress of the work which may be either within the highway right-of-way or on adjacent property. Should the Superintendent, or his representative, discover any hazardous condition so created, he may issue verbal instructions or written notice to the permittee to eliminate the cause. In the event the permittee fails to take immediate action to remove such hazardous conditions, the Department reserves the right to take such action as it may deem necessary to safeguard the public. All costs resulting therefrom shall be paid by the permittee to be deducted from deposit on file or Surety given by the permittee. In the event the expenses exceed the amount of the Surety Bond on deposit, the permittee shall promptly pay the balance due.
9. The Superintendent of Public Works reserves the right to revoke or annul the permit at any time and at his discretion without a hearing or the necessity of showing cause.
10. The applicant agrees to pay all necessary expenses incident to supervision and inspection by reason of the granting of a permit as certified by the Superintendent of Public Works, such payment to be made within ten days from the rendering of the certified amount.
11. Works authorized by the permit shall be commenced within 30 days from the date of permit and performed in a workmanlike and expeditious manner without unreasonable delay or interference with the public travel. The permittee shall provide suitable safeguards so as to reduce to an absolute minimum any dangerous conditions hazardous to life, limb or property.
12. Traffic shall be maintained by the permittee on the highway while the work is in progress and until its final completion.
13. The applicant hereby certifies that he has secured compensation for the benefit of, and will keep insured during the performance of the above described work, such employees as are required to be insured, by the provisions of the Workmen= Compensation Law, and acts amendatory thereto.
14. If necessity arises in the future because of highway maintenance, reconstruction or new construction, requiring the relocation, replacement or removal of the installation authorized by the permit, said work shall be done and all expenses borne by the permittee, his grantees, successors or assigns.

Warren County Board of Supervisors

RESOLUTION NO. 494 OF 2003

Resolution introduced by Supervisors Belden, Bentley, Haskell, Brower, Quintal, Bennett and Mason

ADOPTING THE NEW YORK STATE DEPARTMENT OF TRANSPORTATION POLICY AND STANDARDS FOR ACCESS TO COUNTY ROADS

WHEREAS, Warren County adopted policy standards relating to access to county roads pursuant to Resolution No. 115 of 1962, and

WHEREAS, it appears that the said original standards were modeled after New York State Department of Transportation standards, and since that time there have been changes in said standards, and the Superintendent of the Department of Public Works has recommended adopting the current New York State Department of Transportation standards as revised through 1998, now, therefore, be it

RESOLVED, that Warren County Board of Supervisors adopts as the county standard for access to county roads, the New York State Department of Transportation Policies and Standards for Entrances to State Highways, revised through February 1998, a copy of which is on file with the Clerk of the Board.

COUNTY OF WARREN
DEPARTMENT OF HIGHWAYS

POLICY and STANDARDS

For Entrances to County Roads

- **For public safety and comfort**
- **For uniform practice**
- **For highway protection**

HERRICK OSBORNE, P. E.
County Superintendent of Highways
261 Main Street - Warrensburg, N. Y.

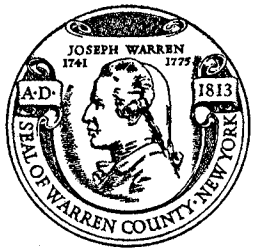
Introduction

The laws of the State of New York prescribe the owers and duties of the County Superintendent of lighways including the general supervision of all high- ays and bridges which are constructed, improved or aintained in whole or in part by the aid of County oneys.

In accordance with the exercise of those duties ere has been established within the Department of ighways definite standards and procedures govern- g the construction of entrances to County Roads o as to regulate traffic thereon entering or leaving ommercial establishments, residences and farms. hese standards and procedures are consistent with ose approved and recommended by the American ssociation of State Highway Officials. The adoption f such uniform procedures and standards and their pplication throughout the State have greatly pro- oted the safe movement of vehicles along the high- ays.

The provisions, policy and standards set forth in is manual shall represent the official policy of the epartment of Highways governing entrances to County Roads and shall become effective May 1, 1962, ereby superseding previous policy and standards eretofore adopted for those purposes.

HERRICK OSBORNE, P. E.
Warren County Superintendent of Highways



RULES AND REGULATIONS FOR ENTRANCES TO COUNTY ROADS AUTHORITY

The "Highway Law", Chapter 25 of the Consolidated Laws of New York, prescribes certain powers and duties of the County Superintendent of Highways. Among those duties are the general supervision of all highways and bridges which are constructed, improved or maintained in whole or in part by the aid of County moneys. He is also authorized to issue permits authorizing entrance upon and certain work to be performed upon any County Road or section thereof.

In this connection, attention is directed to Section 136 of the "Highway Law" which provides as follows:

§136 RAILROADS AND OTHER WORKS AND STRUCTURES IN AND UPON ROADS ON A COUNTY ROAD SYSTEM

No street surface or other railroad shall be constructed upon any portion of a road constructed or improved on a county road system, nor shall any person, firm, corporation or municipality enter upon or construct any works in or upon any such road, or construct any overhead or underground crossing thereof, or lay or maintain therein drainage sewer or water pipes underground, except under such conditions and regulations as may be prescribed by the county superintendent, not withstanding any consent or franchise granted by any town or by the municipal authorities of any village or town. Any municipal corporation may enter upon any road constructed or improved on a county road system for the purpose of widening the pavement or constructing sidewalks or for any other purpose authorized by this section, but only after securing a permit as provided herein. Notwithstanding the limitations in any general or special law. Every municipal corporation shall have and is hereby given authority to deposit with the county superintendent such a sum of money as may be required by the county superintendent as a condition precedent to the granting of the permit provided in this section. Any person, firm or corporation violating this section shall be liable to a fine of not less than one hundred dollars nor more than one thousand dollars for each day of such violation, to be recovered by the county superintendent and paid in to the county treasury to the credit of the county road fund created under article six of this chapter for the construction, reconstruction and maintenance of county roads on the county road system in accordance with the provisions of said article six, and may also be removed therefrom as a trespasser by the county superintendent upon petition to the county court of the county or to the supreme court of the state. As amended L. 1951, c. 49, #2, eff. Feb. 26, 1951.

L. 1951, c. 49, #2, eff. Feb. 26, 1951, in sentence beginning "Any municipal corporation" inserted "or constructing sidewalks".

PURPOSE

This publication sets forth the policy of the County of Warren, Department of Highways concerning entrances and exits on County highways, and indicates the requirements for the construction of such entrances and exits.

The fundamental objective is threefold; 1) to provide maximum protection to the public through, the orderly control of traffic movement onto and from the highway, 2) to provide a uniform practice throughout the state in the design and construction of entrances and exits and, 3) to provide the necessary drainage at all times.

The following requirements are applicable to all commercial and industrial establishments, service areas, private residences, and farms having access to and/or through the right-of-way of a County Highway, insofar as the requirements for drainage, geometric design, type and quality of workmanship, material used, and work performed in the areas providing ingress and egress to said property, are concerned.

Any person or corporation desiring to gain access to a County Highway shall do so only through a permit for an entrance or exit that adheres to the standards set forth in this manual, and shall make written application to and secure such a permit from the Warren County Superintendent of Highways, 261 Main Street, Warrensburg, N. Y.

PROCEDURE FOR OBTAINING PERMIT FOR DRIVEWAY CONSTRUCTION

APPLICATION

Any person or corporation desiring to construct a driveway connection or other entrance within the right-of-way of a County highway shall before beginning any construction, make written application to and secure a permit from the Warren County Superintendent of Highways, and upon the issuance of such a permit must comply with the terms thereof.

PLAN REQUIRED

Prior to commencing the installation of the driveway or entrance facility, the applicant shall submit to the County Superintendent, plans which shall clearly indicate the character and extent of the work proposed and the manner of performing same. Such plans shall accompany the application for the permit to perform such work. Upon the approval of such application by the County Superintendent, a permit may then be issued stipulating the conditions under which such installation may be performed.

Approval of Application

The approval of the application shall be subject to the following conditions:

1) The application shall be properly and clearly completed.

2) The location, design and construction of driveways shall meet the general and geometric requirements stated in this policy. Necessary provisions for drainage, pavement types and thickness, sight distance requirements, and other general construction details must be acceptable to the County Superintendent.

3) The permit shall require that the applicant assume the following construction responsibilities:

a The applicant shall furnish all materials and bear all costs of necessary construction within the County highway Right-of-Way.

b All work done and all materials used within the right-of-way shall meet the requirements of the County Superintendent of Highways.

c No alteration or addition shall be made to any driveway within the right-of-way without first securing a new permit from the County Superintendent.

d The Warren County Highway Department reserves the right of inspection, by its authorized representatives, of any driveway construction within the the right-of-way. In the event of faulty workmanship and/or materials, the Department of Highways shall have the right to stop work until such time as the objectionable conditions are corrected. All costs incurred in the removal and/or correction of defective workmanship and/or materials shall be borne by the applicant.

The permit shall contain the following conditions with respect to maintenance responsibilities:

1AINTENANCE RESPONSIBILITY

The total cost of all construction and maintenance of the work pecified shall be borne by the applicant, his grantees, successors, nd assigns.

)ESIGN REQUIREMENTS

The design standards which are herein presented are based on he premise that the rights of highway users and abutting property wners can be mutually satisfied. Variations in site conditions are ccommodated in the permissable range of dimensions for the fol-)wing factors: angles of entry and exit, radii, channelization, and ıtersection clearance. The specific requirements are listed below:

1) No more than two driveways to a single commercial or industrial establishment entering on a single highway shall be permitted. Unusual conditions may provide the basis for an exception but review and approval by County Superintendent will be necessary.

2) The maximum width of any driveway shall be fifty (50) feet measured parallel to the highway centerline at the curb or shoulder line with a desirable width of between 35 and 40 feet. In the event that narrow lot frontage does not permit two adequate driveways, then one combined entrance and exit not to exceed fifty (50) feet measured as above may be provided. However, the maximum width of any exit driveway to a divided highway or one-way street shall not exceed thirty-five (35) feet measured parallel to the highway or street centerline at the curb or ditchline.

3) The angle of the driveway with respect to the pavement edge shall not be less than 45°, with a desirable range between 45° - 60°, except that a smaller angle may be used for entrance driveways along a divided highway, permitting only one-way operation of the driveway.

4) Return radii for driveways shall not exceed 50 feet.

5) It is recommended that a minimum of fifteen (15) feet be provided between the right-of-way line and the near edge of any service facility. In any event, this distance should be sufficient so that no vehicles will be serviced on county property or use any portion of the island area.

6) Parking, loading, or servicing of vehicles shall not take place on the right-of-way.

7) Island Areas

Any two driveways connecting with a single highway shall be separated by an island area. The side of the island area next to and parallel to the highway shall be located either at the ditchline, curb line, or outer edge of shoulder but in no case less than ten (10) feet from the edge of pavement or uncurbed highways. The island area shall extend to the right-of-way line and a minimum length of the island shall be ten (10) feet, measured parallel to the roadway at the right-of-way line. The length of island area at the shoulder edge will be determined by the angle of the driveways and the width of right-of-way. All island areas within the right-of-way shall be defined by 4 inch curbs, posts, boulders, guard rails or other suitable material all as approved by the County Superintendent of Highways. Material used to define the island, except concrete curbs, shall be painted white. Curbs may be either barrier or mountable type. Loosestone or gravel surfacing shall be considered unsuitable for this purpose and planting is inadequate delineation.

8) No part of any driveway shall be constructed outside of applicant's frontage.

9) Corner Islands

The length, width and shape of corner island areas will vary for different locations. The angle of intersections, angle of driveways, width of right-of-way on both approaches, channelization, radii, and other conditions will influence the location of driveways at intersections. The location and angle of an approach in relation to the highway intersection shall be such that a vehicle leaving the service facility may be merged in the lane of traffic moving in the desired direction before crossing the intersection and that a vehicle entering the facility from the intersection may do so in an orderly and safe manner with a minimum of interference to through traffic.

The following conditions will be applicable in most instances.

a No driveway shall be allowed to encroach upon pavement edge radii.

b The following minimum distances shall apply where there is no conflict with the foregoing conditions.

At Rural Intersections, the minimum distance between the nearest edge of the driveway and the cross-road edge of pavement, measured along the edge of pavement, shall be 35 feet, for both the major and minor routes.

At Urban Intersections, this minimum distance may be reduced to 25 feet.

The County Superintendent shall have the authority to increase ese distances if in his opinion such action is necessary for the otection of traffic. The County Superintendent may also modify ese requirements if justifiable on the basis of site conditions.

10) Driveway Grades

The grade of entrances and exits shall be constructed to slope away from the roadway surface for a distance equivalent to the existing ditch line. Where the approaches are paved with black top or concrete the minimum rate of slope shall be $\frac{1}{4}$" per foot. For all other surfacing, the slope shall be a minimum of $\frac{1}{2}$" per foot. The drainage of highway ditches shall not be impeded and the provisions for drainage shall be subject to the approval of the County Superintendent.

Where grades along the highway are less than 0.30%, open mesh grating shall be used continuously across drives to positively insure drainage water reaching the ditch or sewer.

The cost of any pipe, grating, or paving required to provide access shall be paid for by the abutting property owner. The type, strength, and size and depth of any such pipe, grating or paving, that is placed within the highway right-of-way shall be in accordance with the specifications and requirements of the County Superintendent as indicated on the approved permit.

11) Drainage

Since drainage is an important factor in the safety and structural stability of the highway all drainage features in connection with the permitted construction shall be as approved. In no case shall the permitted construction cause water to stand on the pavement or shoulders.

12) Existing Facilities

Whenever an existing County highway is improved by reconstruction or maintenance work, existing entrances to the highway will be altered to conform to the spirit and intent of the policy and standards set forth in this manual.

Where entrances to County highways have been constructed without benefit of a permit as required under Section 136 of the "Highway Law" and the entrance (or entrances) do not conform with the standards set forth herein, the owner shall be given a reasonable length of time in which to apply for a permit and make necessary alterations as required by such permit.

The attached sketches are presented only to illustrate the requirements outlined in the preceding paragraphs and are not to be construed as required layouts.

Notes: It is not feasible to develop a detailed layout sketch for all likely combinations of the major factors involved in the geometric design of driveways connecting roadside establishments and residences on rural highways without control of access. Instead, these general dimensions are presented for the controls more or less common to all driveways. With these as a guide, the designer can work out desirable plans for almost any condition. Corresponding values for urban highway conditions are similar but with somewhat smaller dimensions because of the restricted width, low speeds and high property values. The influence of pedestrian facilities also are evident.

figure 1

The sketch illustrates;

1) Recommended minimum distance from right-of-way line to nearest edge of a service facility.
2) Minimum distance that driveways may be located in proximity of intersection. (If pavement edge radii should extend past these minimum distances, driveways may not encroach upon the radii.)
3) Maximum widths of driveways and how width is measured.
4) Minimum length of center islands, measured along right-of-way line.
5) Allowable angle of driveways.
6) Maximum return radii.
7) Reserved area adjacent to property lines.
8) Minimum shoulder width.

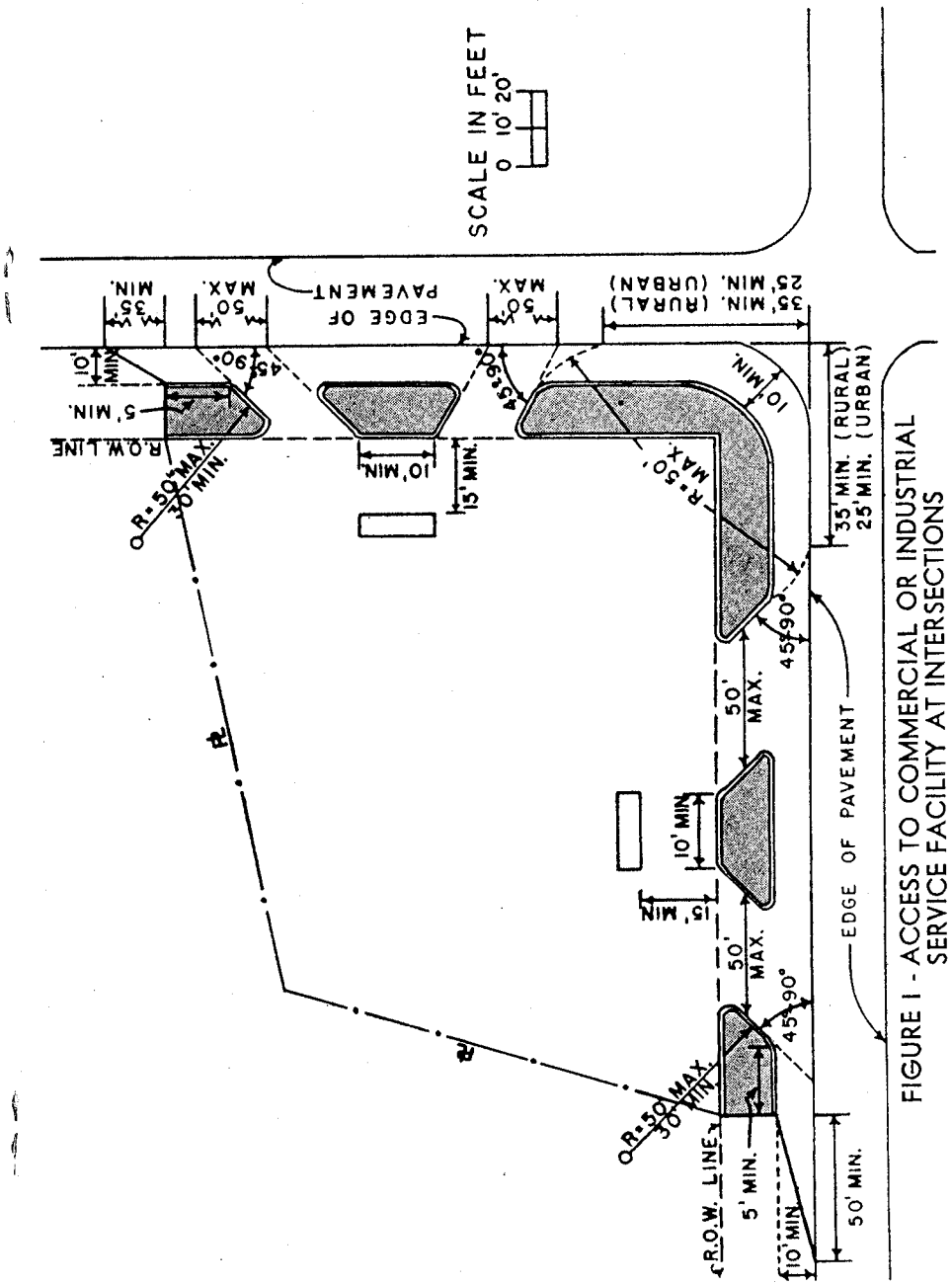


FIGURE 1 - ACCESS TO COMMERCIAL OR INDUSTRIAL SERVICE FACILITY AT INTERSECTIONS

figure 2

The sketch illustrates;

1) Reserve sight distance area at corner locations.
2) Maximum return radii.
3) Recommended minimum distance from the right-of-way line to nearest edge of a service facility.
4) Maximum width of driveways and how width is measured.
5) Allowable angle of driveways.
6) Minimum length of center islands measured along right-of-way line.
7) Reserved area adjacent to property lines.
8) Minimum shoulder width.

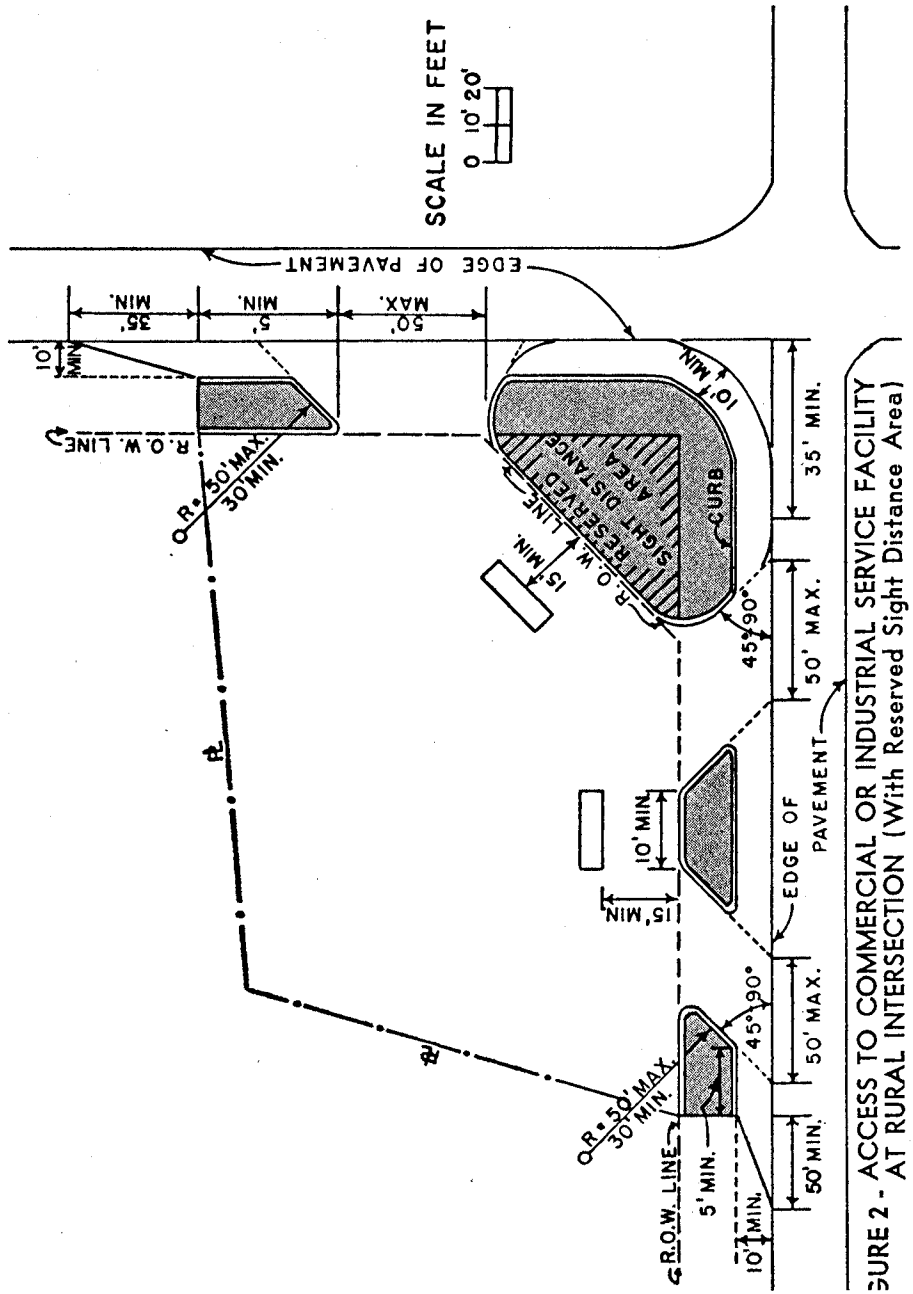


FIGURE 2 - ACCESS TO COMMERCIAL OR INDUSTRIAL SERVICE FACILITY AT RURAL INTERSECTION (With Reserved Sight Distance Area)

figure 3

The sketch illustrates;

1) Maximum widths of driveways and how width is measured.

2) Maximum return radii.

3) Recommended minimum distance from right-of-way line to nearest edge of a service facility.

4) Minimum length of center island measured along right-of-way line.

5) Allowable angle of driveways.

6) Location of drainage structures.

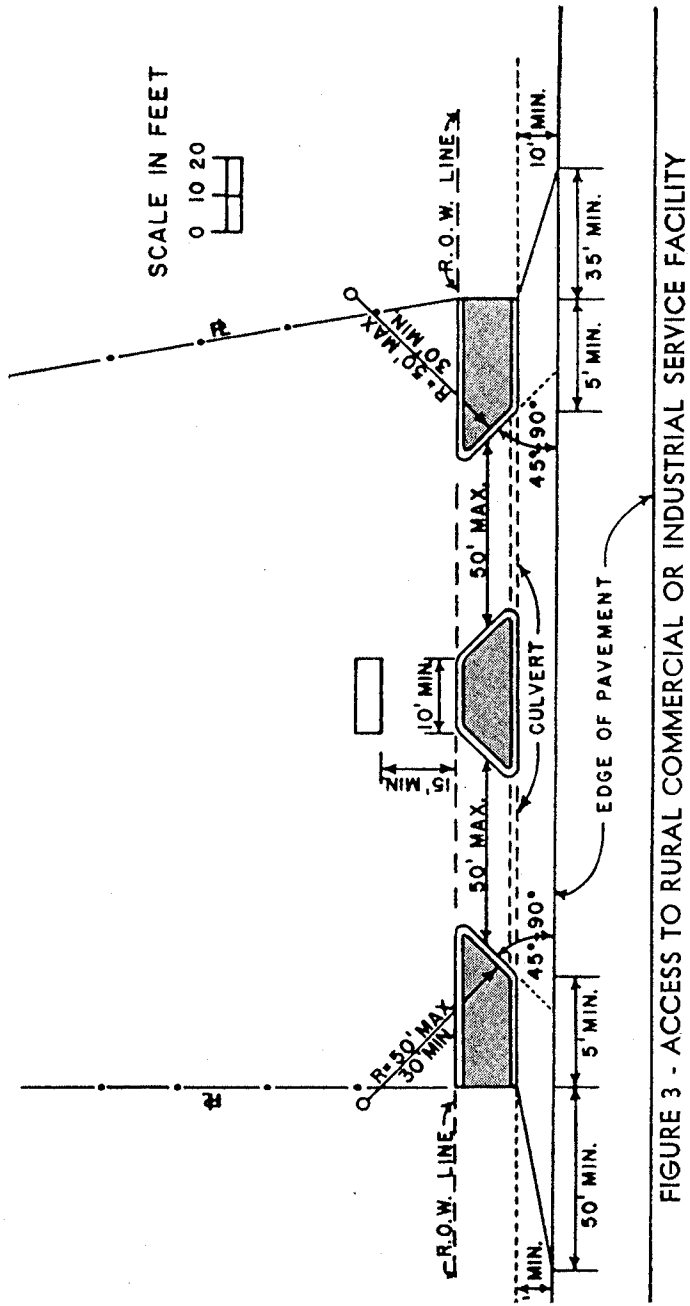


FIGURE 3 - ACCESS TO RURAL COMMERCIAL OR INDUSTRIAL SERVICE FACILITY

figure 4

The sketch illustrates;

1) Recommended minimum distance from right-of-way line to nearest edge of a service facility.

2) Minimum distances that driveways may be located in proximity of intersections in urban areas. (If pavement edge radii should extend past the minimum distance, driveways may not encroach upon the radii.)

3) Maximum widths of driveways and how width is measured.

4) Minimum length of center island measured along right-of-way line.

5) Allowable angle of driveways.

6) Maximum return radii.

7) Reserved area adjacent to property lines.

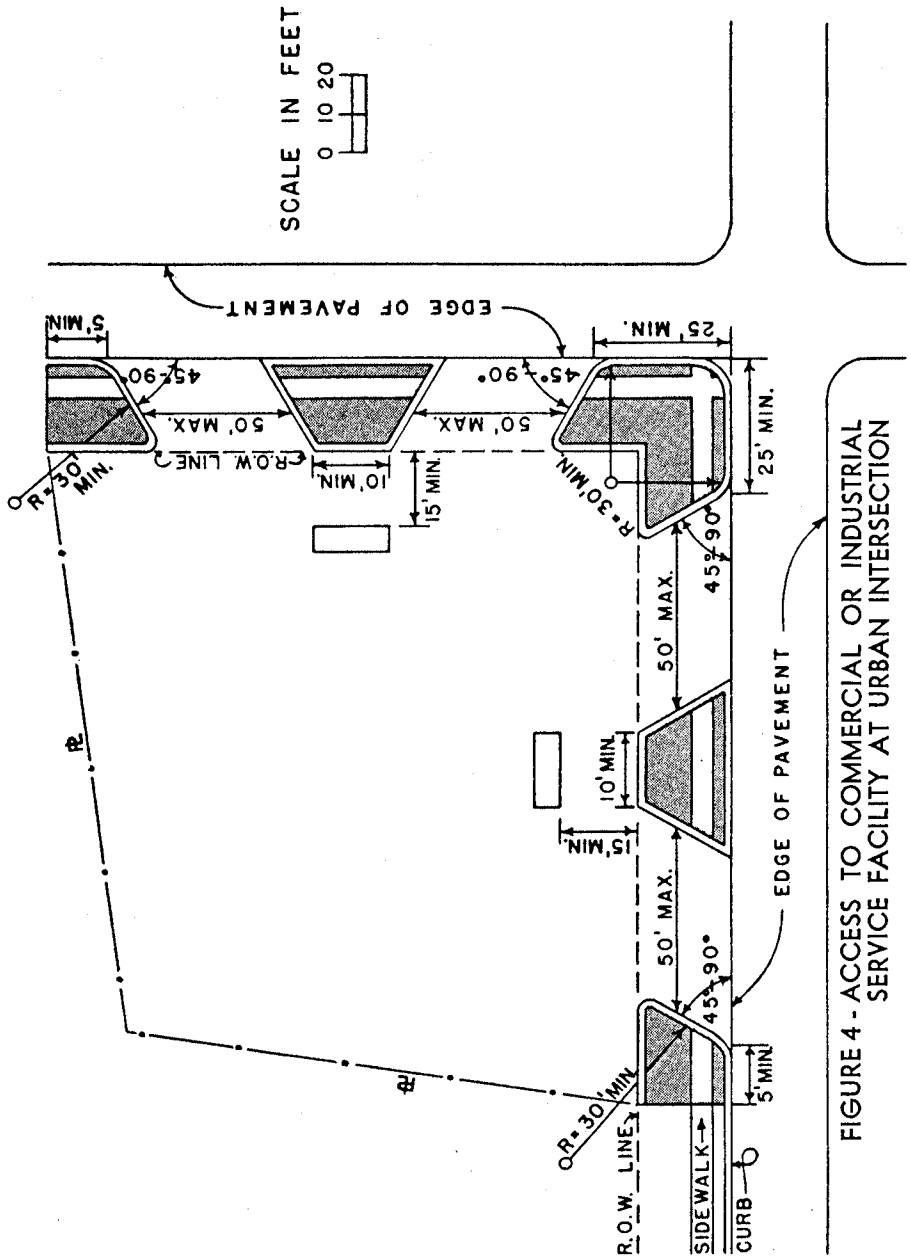


FIGURE 4 - ACCESS TO COMMERCIAL OR INDUSTRIAL SERVICE FACILITY AT URBAN INTERSECTION

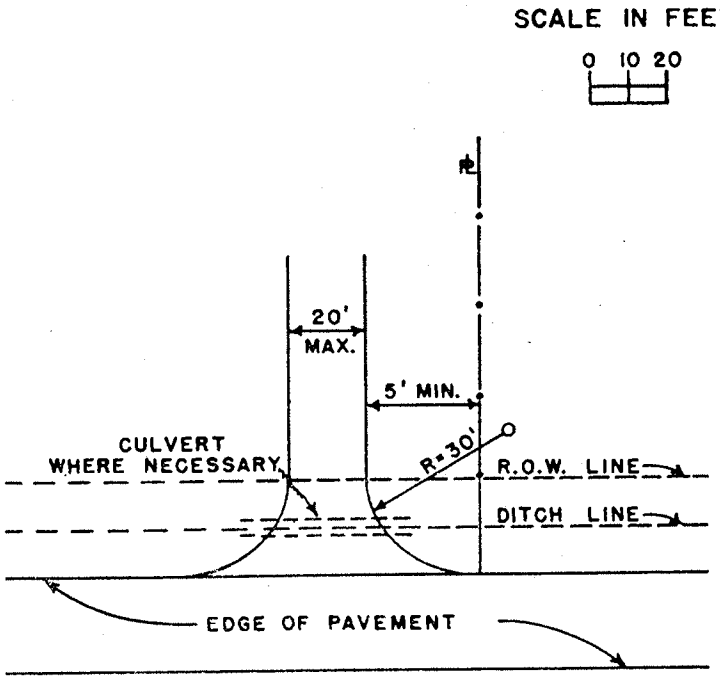


FIGURE 5 - ACCESS TO RESIDENCE OR FARM

TABLE - 1
DESIRABLE ENTRANCE DESIGNS FOR VARIOUS FRONTAGES

LINE DIAGRAMS DESIRABLE ENTRANCE DESIGNS (45°- 60° ANGLES 35-40FT. WIDE DRIVES)	DISTANCE EDGE OF PAVEMENT TO R.O.W. LINE. 1/ -FEET-	FRONTAGE WIDTHS -FEET-			
1	2	3	4	5	6
		125 & UNDER	150	175	200 & OVER
1. 35 FT. DRIVES (45°, 45°)	13	NOT APPLICABLE SPECIAL DESIGN REQUIRED			
	14				
	15				
2. 35 FT. DRIVES (45°, 60°)	21		1 & 3	1 & 3	1 & 3
	22		1 & 3	1 & 3	1 & 3
3. 40 FT. DRIVES (45°, 45°)	23		1 & 3	1 & 3	1 & 3
	24		1 & 3	1 & 3	1 & 3
4. 40 FT. DRIVES (45°, 60°)	25		ALL	ALL	ALL
	26		ALL	ALL	ALL
5. 35 FT. DRIVES (60°, 60°)	28		1,2,4,5,6	ALL	ALL
	29		1,2,4,5,6	ALL	ALL
	31		1,2,5,6	ALL	ALL
6. 40 FT. DRIVES (60°, 60°)	39		5	ALL	ALL
	48			2,5,6	ALL

1. The RANGE OF DISTANCES FROM EDGE OF PAVEMENT TO RIGHT-OF-WAY LINE WERE DETERMINED FROM AN EXAMINATION OF THE COMBINATIONS OF RIGHT-OF-WAY, PAVEMENT AND MEDIAN WIDTHS MOST COMMON ON THE HIGHWAY SYSTEM WITH NO CONTROL OF ACCESS.

State of New York
Department of Transportation

Form PERM 33 (8/01)

Highway Work Permit Application for Non-Utility Work

Instructions and Form

Submit three copies (photocopies acceptable)

INSTRUCTIONS FOR COMPLETING THE APPLICATION FOR HIGHWAY WORK PERMIT – NON-UTILITY

FRONT OF APPLICATION

An Applicant may not have all pertinent information at the time of completing the application form since certain information relative to fees, insurance and guarantee deposits may be contingent upon determinations to be made by the Department. In such cases, the information may be left blank and remittance withheld until the information is determined by the Department.

Please complete the following:

- Permittee's name and address. For more than one applicant, also fill in the joint applicant's name and address.
- Federal Identification Number of the company or individual Social Security Number.
- Applicant's telephone number. A telephone number where applicant can be contacted concerning the application. Please include area code.
- Project Identification No. and Highway Work Permit No. will be completed by the issuing office.
- Name of Contact person and their telephone number in case of emergency.
- If Highway Work Permit is to be returned to someone other than the applicant, complete this section.
- Estimate the cost of work being performed in the State highway right-of-way and place this figure on the blank line.
- Indicate anticipated duration of work to be performed with starting date and ending date on this line.
- You may provide your own insurance, purchase insurance through the Department, if available, or provide an Undertaking (for Utilities and Municipalities only). If you choose to provide your own insurance, a PERM 17 will be necessary. The PERM 17 may be obtained at the office you obtained this form from. It must be completed by your insurance company and accompany the permit application upon submission. The Policy number and expiration date of the PERM 17 should be shown on this line.
- Give a brief description of the proposed work that is to be done under this permit
- Plans and specifications should accompany this application for any work that involves construction within the State highway right-of-way. Place a check mark on the lines for plans and specifications if they are attached.
- Location of the project should be identified by: State Route; State Highway Number, if known; State Highway reference markers and Town and County in which work area is located.
- SEQR requirements: This may be required for larger projects – Contact the Regional Office of the Department of Transportation to determine if these requirements are necessary.
- Signature of applicant (permittee) and date.
- Signature of second applicant, if any, and date.

BACK OF APPLICATION

- Check type of work that will be performed.
- In the appropriate column indicate:
  - Manner in which insurance coverage is furnished the Department, i.e., PERM 17 (P17) or Under-Taking (UT) or Insurance Fee (IF), if available (N/A means the Department's insurance is not available).
- Indicate total amount of permit fee and insurance fee, if applicable.
- Indicate check number of Guarantee Deposit or Bond Number, if required. This will be determined by the Department upon submission of application.

Shaded areas will be completed by the Department of Transportation.

Remove the application form from the back of this packet and submit 3 copies to the Department for approval.

RESPONSIBILITIES OF PERMITTEE
PURSUANT TO NON-UTILITY HIGHWAY WORK PERMITS

FAILURE TO OBTAIN A PERMIT OR FAILURE TO COMPLY WITH THE TERMS OF A PERMIT MAY RESULT IN THE DEPARTMENT HALTING THE ACTIVITY FOR WHICH A PERMIT IS REQUIRED UNTIL ADEQUATE CORRECTIONS HAVE BEEN MADE.

PROTECTIVE LIABILITY INSURANCE COVERAGE

Permittee must have protective liability insurance coverage in accordance with Department requirements. See "Certificate of Insurance for Highway Permits" (Form PERM 17, NYSDOT).

Expiration of, or lack of, liability insurance automatically terminates the permit. Insurance coverage may be provided by furnishing the Department with one of the following:

1. A completed Certificate of Insurance for Highway Permits (Form PERM 17, NYSDOT).
2. Purchase the Department Blanket Policy for Highway Work Permits from the Department, if available. N/A shown on the Application in the insurance column means Department insurance coverage is not available for that type of project.
3. Provide an Undertaking. Undertakings are limited to Public Service Corporations and government units.

COMPENSATION INSURANCE AND DISABILITY COVERAGE

The permittee is required to have compensation insurance and disability coverage as noted in the provisions of the Worker's Compensation Law and Acts amendatory thereof for the entire period of the permit, or the permit is invalid.

NOTIFICATION

The following should be notified at the appropriate time as shown below:

1. Commissioner of Transportation, through Regional Office, one week prior to commencing work.
2. Area gas distributors 72 hours prior to any blasting.
3. Utility companies with facilities in work areas before starting work, in accordance with Industrial Code 53 (permission from utility company must be obtained before commencing work affecting utilities' facilities).
4. New York State Department of Transportation, Regional Signal Maintenance Shop, 3 days prior to starting work.
5. New York State Department of Transportation Regional Office at conclusion of work and return original copy of permit to Resident Engineer.

Permit Notification for Annual Permits: Notify by telephone, the Regional or Resident Engineer's Office in advance, when work is to be performed.

SITE CARE AND RESTORATION

An Undertaking, a bond or a certified check in an amount designated by the Department of Transportation may be required by the Regional Office, before a permit is issued, to guarantee restoration of the site to its original condition. If the Department is obliged to restore the site to its original condition, the costs to the Department will be deducted from the amount of the permittee's guarantee deposit at the conclusion of the work. Costs in excess of the Bond/guarantee deposit on file will be billed directly to the permittee.

The permittee is responsible for traffic protection and maintenance including adequate use of signs and barriers during work and evening hours. Anyone working within the State highway right-of-way will wear high visibility apparel (orange/yellow) and hard hat.

No unnecessary obstruction is to be left on the pavement or the State highway right-of-way or in such a position as to block warning signs during non-working hours.

No work shall be done to obstruct drainage or divert creeks, water courses or sluices onto the State highway right-of-way.

All false work must be removed and all excavations must be filled in and restored to the satisfaction of the Regional Maintenance Engineer.

COSTS INCURRED BY ISSUANCE OF THIS PERMIT

All costs beyond the limits of the protective liability insurance, surety deposits, etc. are the responsibility of the permittee. The State shall be held free of any costs incurred by the issuance of this permit, direct or indirect.

SUBMITTING WORK PLANS

The applicant will submit work plans and/or a map as required by the Department. This shall include such details as measurements of driveways with relation to nearest property corner, positions of guys supporting poles and a schedule of the number of poles and feet of excavation necessary for completion of the work on the State right-of-way. A description of the proposed method of construction will be included.

Plan work with future adjustments in mind, as any relocation, replacement or removal of the installation authorized by this permit and made necessary by future highway maintenance, reconstruction or new construction, will be the responsibility of the permittee.

Driveway plans should be prepared in accordance with the POLICY AND STANDARDS FOR ENTRANCES TO STATE HIGHWAYS.

The permittee must coordinate the work with any state construction being conducted.

TRAFFIC MAINTENANCE

A plan detailing how the permittee intends to maintain and protect traffic shall be submitted with work plans. Traffic shall be maintained on the highway in a safe manner during working and non-working hours until construction is completed. The permittee is responsible for traffic protection and maintenance, including adequate use of signs, barriers, and flag persons during working and non-working hours until construction is completed.
All sketches will be stamped with "MAINTENANCE OF TRAFFIC SHALL BE IN CONFORMANCE WITH THE NEW YORK STATE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES."

COST OF INSPECTION AND SUPERVISION

Prior to issuance of the Highway Work Permit, the permittee may be required to sign an INSPECTION PAYMENT AGREEMENT FOR HIGHWAY WORK PERMITS (FORM PERM 50) agreeing to the payment of inspection charges and/or PAYMENT OF AGREEMENT FOR HIGHWAY WORK PERMITS DESIGN REVIEW (FORM PERM 51) for Department employees. Inspection charges will be based on number of work days. Design Review charges will be based on number of work hours.

SCOPE

Areas Covered: Permits issued are for highways, bridges and culverts over which the New York State Department of Transportation has jurisdiction. (Local governments issue permits for highways under their jurisdiction.)

Legal: The privilege granted by the permit does not authorize any infringement of federal, state or local laws or regulations, is limited to the extent of the authority of this Department in the promises and is transferable and assignable only with the written consent of the Commissioner of Transportation.

Commissioner's Reservation: The Commissioner of Transportation reserves the right to modify fees and to revoke or annul the permit at any time, at his discretion without a hearing or the necessity of showing cause.

Locations: Work locations must be approved by the Department.

Maintenance: Property owners having access to a state highway shall be fully responsible for the maintenance of their driveway in accordance with POLICY AND STANDARDS FOR ENTRANCES TO STATE HIGHWAYS.

Work Commencement: The Permittee shall have a copy of the permit available at the site during the construction period. Work should start within 30 days from validation date of permit or said permit may be revoked.

COMPLETION OF PROJECT

Upon completion of the work within the state highway right-of-way authorized by the work permit, the person and his or its successors in interest, shall be responsible for the maintenance and repair of such work or portion of such work as set forth within the Terms and Conditions of the Highway Work Permit.

PERM 33 (8/01)

STATE OF NEW YORK DEPARTMENT OF TRANSPORTATION
HIGHWAY WORK PERMIT APPLICATION FOR NON-UTILITY WORK

PREPARE 3 COPIES
(photocopies acceptable)

Application is hereby made for a highway work permit:

Name _____

Address _____

City _____ State _____ Zip _____

Federal I.D. No. or Social Security No. _____

Applicant Telephone No. _____

Contact person in case of emergency _____

Telephone No. of contact person _____

For Joint application, name and address of Second Applicant below:

Name _____

Address _____

City _____ State _____ Zip _____

Project Identification No. _____

Highway Work Permit No. _____

RETURN PERMIT TO (If different from above):

Name _____

Address _____

City _____ State _____ Zip _____

RETURN OF DEPOSIT/BOND TO (Complete only if different from permittee):

Name _____

Address _____

City _____ State _____ Zip _____

1. Estimated cost of work being performed in state highway right-of-way $ _____

2. Anticipated duration of work: From _____ 20, _____ thru _____, 20 _____, to apply to the operation(s) checked on the reverse side.

3. Protective Liability Insurance covered by Policy No. _____ ; expires on _____ 20 _____

4. A $20.00 fee will be charged for checks returned by the bank.

PROPOSED WORK (Brief description): _____

_____

_____

_____

ATTACHED: Plans _____ Specifications _____ LOCATION: State Route _____ State Highway _____

between Reference Marker _____ and Reference Marker _____

Town of: _____ County of: _____

SEQR REQUIREMENTS (Check appropriate item):

_____ Exempt _____ Ministerial _____ Type 11 _____ EIS or DEIS Lead Agency _____

If project is identified to be ministerial, exempt, or TYPE 11, no further action is required.

If project is determined to be other than ministerial, exempt, or TYPE 11, refer to M.A.P.7.12-2, Appendix A SEQR REQUIREMENTS FOR HIGHWAY WORK PERMITS.

Acceptance of the requested permit subjects the permittee to the restrictions, regulations and obligations stated on this application and on the permit.

Applicant Signature _____ Date _____ 20 _____.

Second Applicant Signature _____ Date _____ 20 _____.

Approval recommended _____ 20 ___, By Resident Engineer _____ Residency No. _____

Approved _____ 20 ___, By Regional Traffic Engineer _____ Region No. _____

PERMIT IS ISSUED CONTINGENT UPON LOCAL REQUIREMENTS BEING SATISFIED.

CHECK TYPE OF OPERATION	Permit Fee	Insurance Fee	Perm 17 or Under Taking	Total Amount of Fee and/or Insurance	Guarantee Deposit and/or Bond Amount
5. ❑ Single job – Permit issued for each job					
a. ❑ Driveway or roadway					
1. ❑ Residential	$ 15	$ 25			
2. ❑ Commercial – Minor	550	175			
a. ❑ Home Business	100	75			
3. ❑ Commercial – Major – (Less than 100,000 square feet Gross Building Area)	1400	N/A			
4. ❑ Commercial – Major – (100,000 square feet Gross Building Area and Greater)	Actual cost with Minimum of $2000 upon permit app.	N/A			
5. ❑ Subdivision Street	900	N/A			
6. ❑ Temporary access road or street	200	150			
b. ❑ Improvement					
1. ❑ Residential	15	25			
2. ❑ Commercial					
Check additional description below:					
a. ❑ Install sidewalk, curb paving, stabilized shoulder, drainage, etc.	200	150			
b. ❑ Grade, seed, improve land contour, clear land of brush, etc.	100	75			
c. ❑ Resurface existing roadway or driveway	50	50			
d. ❑ Annual resurfacing of residential and commercial roadways or driveways.					
1. ❑ Per County	150	N/A			
2. ❑ Per Region	400	N/A			
c. ❑ Tree Work					
1. ❑ Residential	15	25			
2. ❑ Commercial (not required for pruning if utility has annual maintenance permit)	25	50			
Check additional description below:					
a. ❑ Removal or planting					
b. ❑ Pruning, applying chemicals to stumps, etc.					
3. ❑ Vegetation control for advertising signs	150/sign	75			
d. ❑ Miscellaneous Construction					
1. ❑ Beautifying ROW – (for Civic Groups only)	NC	25			
2. ❑ Temporary signs, banners, holiday decorations					
a. ❑ Not-for-profit organizations	NC	25			
b. ❑ Organizations other than not-for-profit	25	25			
3. ❑ Traffic control signals	500	175			
4. ❑ Warning and entrance signs	25	50			
5. ❑ Miscellaneous – Requiring substantial review	400	175			
6. ❑ Miscellaneous	25	50			
6. ❑ Encroachment caused by D.O.T. acquisition of property	25	50			
7. ❑ Compulsory permit required for work performed at the request of D.O.T.					
a. ❑ Building demolition or moving requested by D.O.T.	NC	25			
1. ❑ Demolition 2. ❑ Moving					
b. ❑ Improvement to meet Department standards	NC	25			
8. ❑ Miscellaneous	25	25			
9. ❑ Adopt a Highway	NC	N/A			

Guarantee Deposit Check Number or Bond Number _____

State of New York
Department of Transportation

(Revised 11/03)

Residential Driveway Form

Instructions and Form

Submit with PERM 33

DRIVEWAY DESIGN POLICY

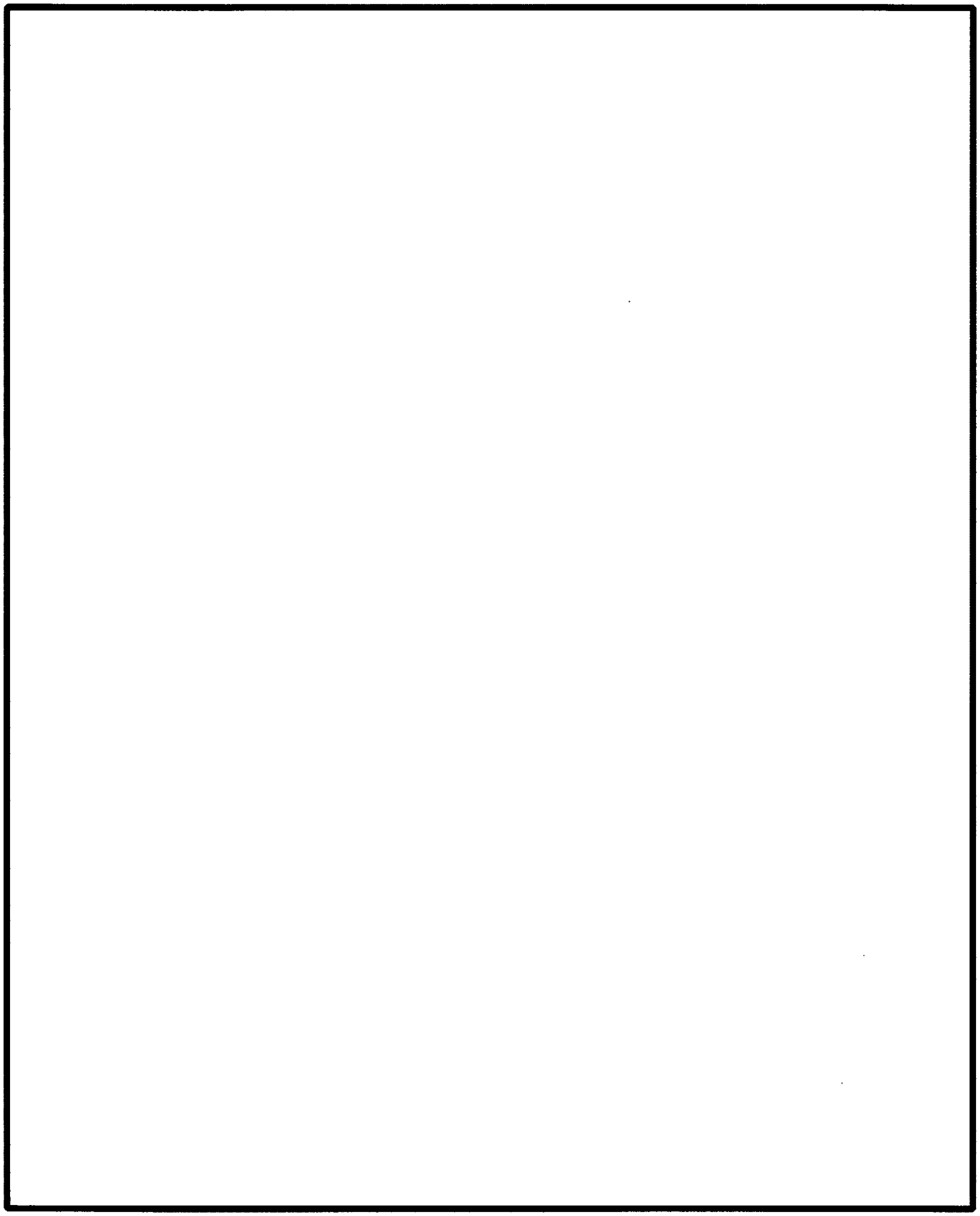
INSTRUCTIONS - This form is for residential driveway applicants only. This form is to be submitted with the PERM 33 *Highway Work Permit Application*. Refer to the New York State *Policy and Standards for the Design of Entrances to State Highways* (i.e., The Driveway Design Policy) for copies of the PERM 33 and for additional guidance and requirements. Complete the white sections of this form.

HELP - Contact the NYSDOT Resident Engineer listed on the Department's Internet home page http://www.dot.state.ny.us/reg/regmenu.html. The address and phone number are also listed in the Government Listings (blue pages) of your local phone book (typically under State Offices, Transportation Department of, Transportation Maintenance).

COPIES - The Driveway Design Policy is available from the New York State Department of Transportation online at http://www.dot.state.ny.us/ or from the Plans Sales Office at (518) 457-2124.

#	Requirements and Questions	✔ or reply
1.	**Sketch of Driveway Site** - A sketch with the following items should be completed on a copy of a tax map or site map and stapled to this form. If a tax map or site map is not available, place a sketch showing the items below on the following page. Please clearly label the items on the sketch and use a ruler or straight edge (The sketch must be clearly legible). • North directional arrow. • Existing location and dimensions of the following items along the frontage of the applicant's property: ▸ Width of the outside highway travel lane. ▸ Width of the highway shoulder. ▸ If the applicant's property is a corner lot, include the distance from the edge of proposed driveway to the edge of pavement of the intersecting roadway. ▸ Curbs. ▸ Highway drainage (culverts, inlets, and ditches). ▸ Guide rail. ▸ Sidewalk. ▸ Utility poles and boxes. ▸ Traffic signs. ▸ Traffic signals. ▸ Property lines. • Existing and proposed buildings on the applicant's property. • Direction of surface water flow on applicant's property (i.e., direction that the rain water flows across the property). • Centerline of the proposed driveway(s). Refer to Figure 5A-1 of the Driveway Design Policy for restrictions on driveway locations. The Department may require additional information as site-specific conditions warrant. The sketch need not be to scale if dimensions are provided. The dimensions should be as follows: • Dimensions less than 30 m (100 ft) should be to the nearest 0.3 m (1 ft). • Dimensions of 30 m (100 ft) to 100 m (300 ft) should be to the nearest 3 m (10 ft). • Distances greater than 100 m (300 ft) need not be measured and can be noted as ">100 m (300 ft)" on the sketch. • U.S. customary (inches and feet) or metric units may be used.	

Sketch of Driveway Site



DRIVEWAY DESIGN POLICY

#	Requirements and Questions	✔ or reply
2.	**Location** - Street address and the distance and direction from nearest cross street or State Highway Reference Marker (include number). Examples: 409 NY Route 7, Princetown, NY, 300 feet west of Kelly Station Road. 512 NY Route 20, Duanesburg, NY, 1000 feet east of Reference Marker 20 1619 1064.	
3.	**Underground Utilities** - Have the location flagged for underground utilities before construction. Up-State NY, call 1 (800) 962-7962. NYC and Long Island, call 1 (800) 272-4480. Date flagged (month/day/year) =	___/___/___
4.	**Select Driveway Width** - Select a preferred driveway width ranging from 9 ft to 24 ft for driveways 50 ft or less in length and 9 ft to 12 ft for driveways longer than 50 ft.	_____ ft.
5.	**Maximum Grade** - In urban areas, the maximum grade is 8% (1 inch per foot). In rural areas, the maximum grade is 12% (1.5 inches per foot). Maximum grade	_____
6.	**Driveway Materials** - • Existing driveway material = • Proposed driveway material within 10 ft of traveled-way (Asphalt or Concrete) =	_____ _____
7.	**Drainage** - If the driveway will cross a ditch, a culvert with a tapered/flared end section is needed. (Culvert head walls may be permitted only if there is a run of existing guide rail along the highway that would prevent an errant vehicle from being abruptly stopped by the head wall.) • Inside diameter (15 in minimum) = • Material =	_____ in _____.
8.	**Curb** - Answer "No" if the highway is not curbed. Dropped curb is a 1 inch high curb running across the driveway opening. This helps keep storm water from flowing from the highway to a driveway with a downhill slope away from the highway. Will dropped curb be used? (Yes or No)	_____
9.	**Corner Angle** - Angle measured from the highway turning into the driveway. 90° is preferred. Angle must be between 60° and 120°.	_____°
10.	**Layout Method** - Select the layout method using the table below. Attached are the layout instructions. Entrance Type (Radius or Taper) =	_____

Driveway Entrance Type Selection

Entrance Type	Conditions for Use				
	Corner Angle*	Travel Lane and Paved Shoulder Width	Curb	Sidewalk	Highway Design Speed
Radius Type	60 - 120	Any	Use with or without curb	Use with or without sidewalk	Any
Taper Type	80 - 100	16 ft or greater	Use only with curb	Use with or without sidewalk	Only low speed (posted 40 mph or less)**

* The corner angle is the angle between the driveway centerline and the highway centerline.

** Unless otherwise directed by the Department.

CONSTRUCTION PLANS & PROFILES - The following pages are layout instructions for you or your driveway contractor.

A/GFTC Adirondack Glens Falls Transportation Council

Access Management Slide Show

Prepared by:

Presentation Outline

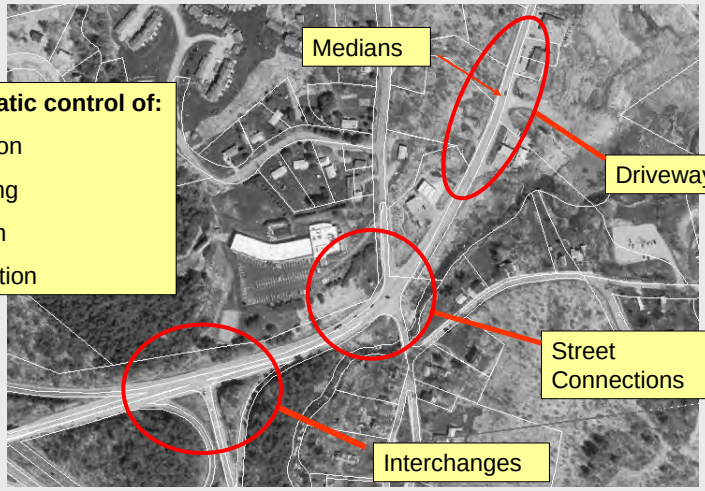
- AM Overview and Goals
  - Examples of AM Techniques
  - General Benefits and Implications of No Action
- AM and Businesses
- AM and Local Governments

Goals of Presentation

- Describe the basics of access management (AM)
- Explain the importance and benefits of AM
- Show how AM is implemented
- Address your concerns and questions
- How to find out more

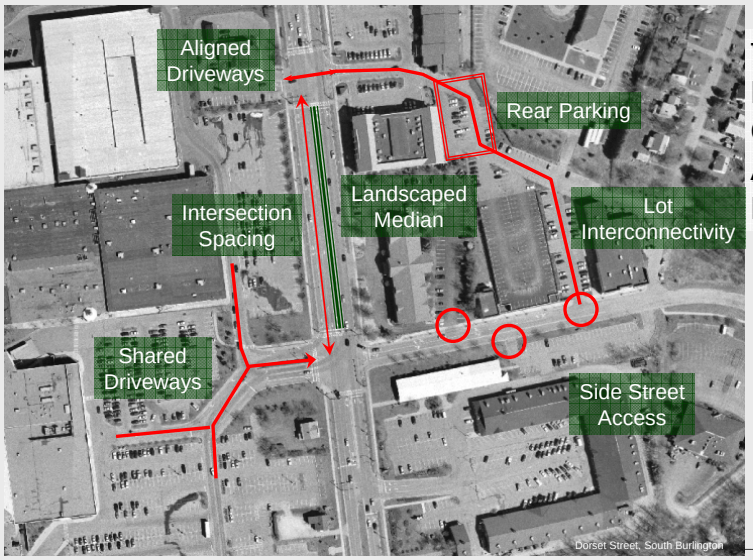
Access Management Overview

What is Access Management?



Systematic control of:

- Location
- Spacing
- Design
- Operation



The Elements Of Access Management

Goals of Access Management

- Improve safety for all road users
- Provide:
  - safe and efficient access to adjacent properties; and
  - mobility for through traffic
- Preserve roadway capacity and ability to accommodate economic development
- Create more attractive roadways
- Support smart growth land development
  - Interconnected street system
  - Access for pedestrians and cyclists
  - Access to transit

10 Principles

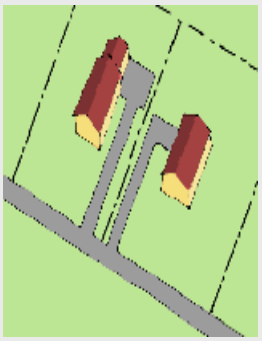
Click for Interactive

10 National AM Principles

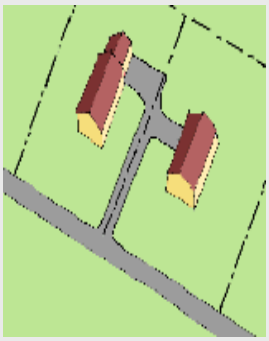
1. Provide a specialized roadway system.
2. Limit direct access to major roadways.
3. Promote intersection hierarchy.
4. Locate signals to favor through movements.
5. Preserve the functional area of intersections and interchanges.
6. Limit the number of conflict points.
7. Separate conflict areas.
8. Remove turning vehicles from through traffic lanes.
9. Use non-traversable medians to manage left turn movements.
10. Provide a supporting street and circulatory system.

Examples of Access Management

- Shared Driveways



Avoid

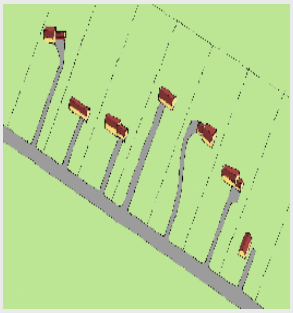


Preferred

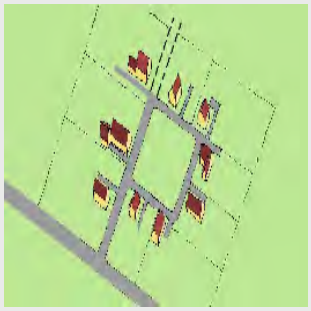
Images: Access Management Guidebook, Northwest Regional Planning Commission and Humstone & Campoli, 1996.

Examples of Access Management

- Cluster Development with Single Access



Avoid

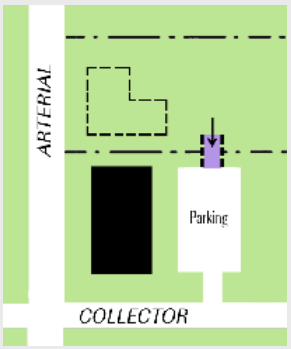


Preferred

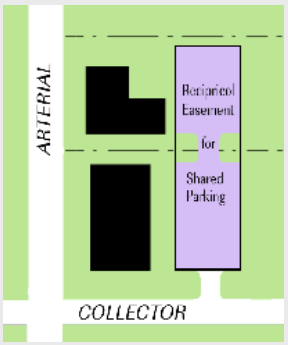
Images: Access Management Guidebook, Northwest Regional Planning Commission and Humstone & Campoli, 1996.

Examples of Access Management

- Create Access Easements



Starting Condition



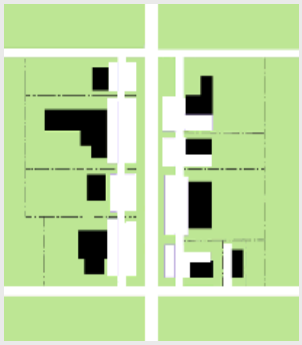
Share Side Street Access

Images: Access Management Guidebook, Northwest Regional Planning Commission and Humstone & Campoli, 1996.

Examples of Access Management

- Connect adjacent parking areas

Avoid

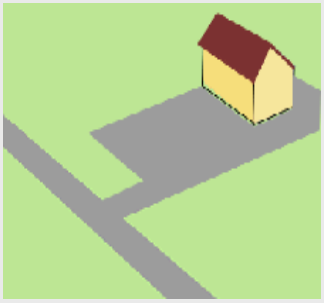


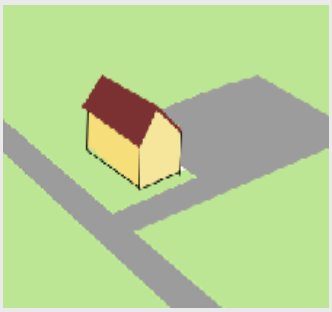
Preferred

Images: Access Management Guidebook, Northwest Regional Planning Commission and Humstone & Campoli, 1996.

Examples of Access Management

- Rear Parking





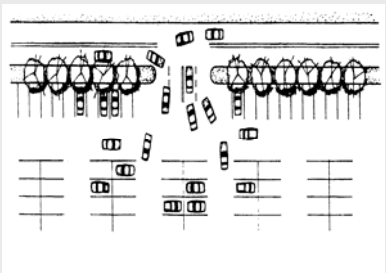
Avoid **Preferred**

Images: Access Management Guidebook, Northwest Regional Planning Commission and Humstone & Campoli, 1996.

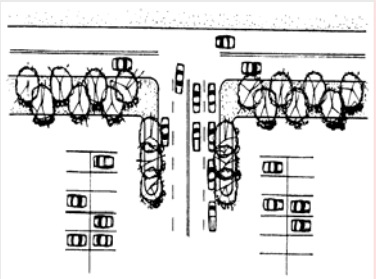
Examples of Access Management

- Throat Length

Difficult and Confusing



Orderly and Safe

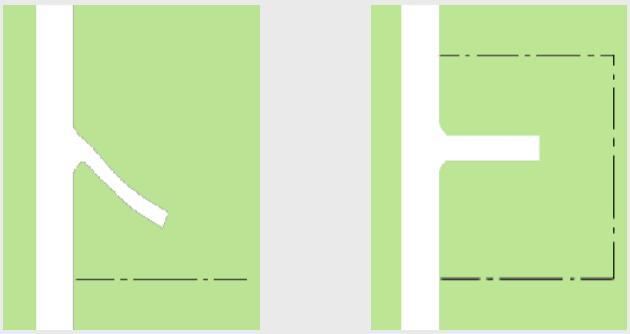


Avoid **Preferred**

Images: Route 16 Corridor Protection Study – Access Management, Strafford Regional Planning Commission, 1998

Examples of Access Management

- Driveway Angle

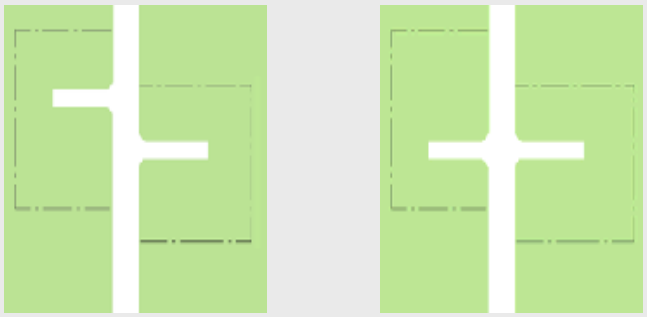


Avoid **Preferred**

Images: Access Management Guidebook, Northwest Regional Planning Commission and Humstone & Campoli, 1996.

Examples of Access Management

- Align Driveways



Avoid **Preferred**

Images: Access Management Guidebook, Northwest Regional Planning Commission and Humstone & Campoli, 1996.

Examples of Access Management

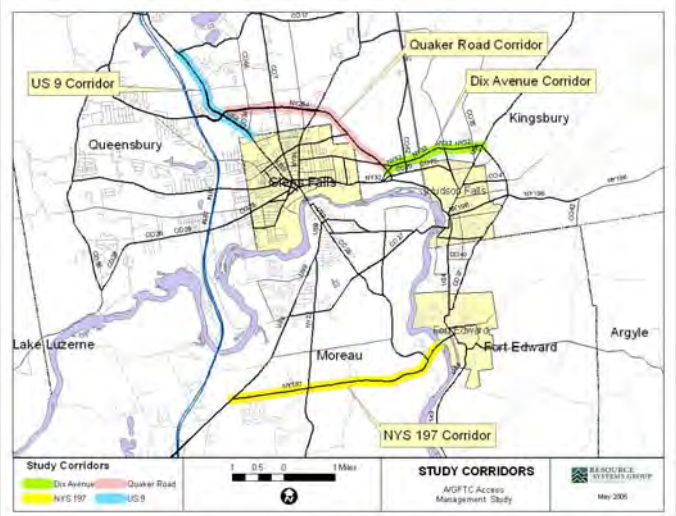
- Separate turning traffic

Left Turn Pocket

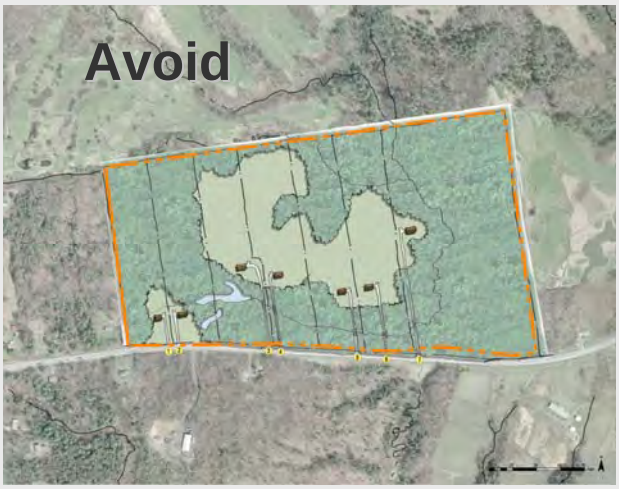
Two way Left-turn Lane

Two good alternatives

Access Management in Sample Corridors

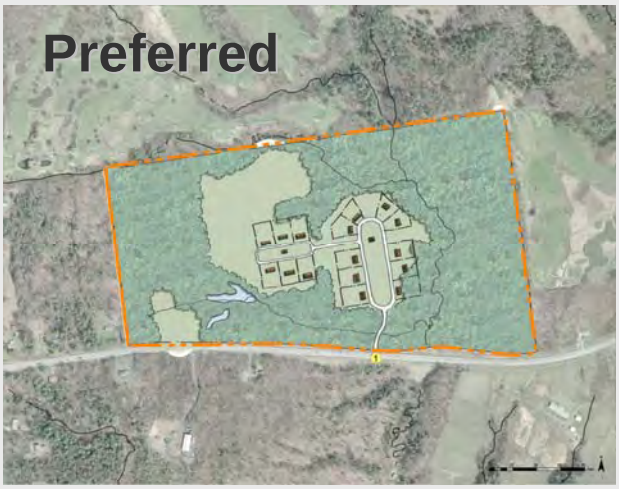


Access Management in Rural Areas (NYS 197)



Option 1: Traditional zoning, up to seven units with seven new curb cuts

Access Management in Rural Areas (NYS 197)



Property consolidation, conservation sub-division, common open space,16 units, 1 curb cut

AM in Transitional Area – Quaker Road

Existing Conditions: 7 Access points to 5 buildings, with no interconnected parking areas.

AM in Transitional Area – Quaker Road

Improvements: Primary access consolidated on Quaker Rd, secondary access from Meadowbrook Ave. and Everts Ave., interconnected shared parking, landscaping along road, sidewalks, bus stop

AM in Suburban/Urban Area - Dix Ave

Existing Conditions – Undefined curb cut, driveways too close to intersection, no sidewalks

Dix Ave Visualization Area

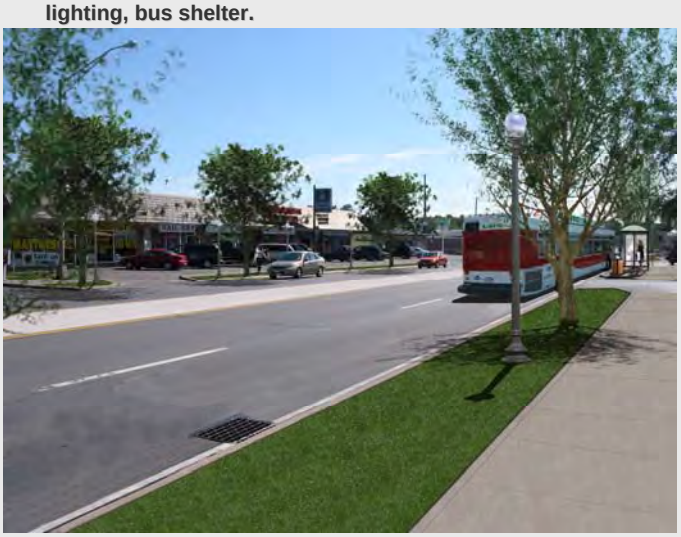
Create definition to parking areas; add bike lane, curbing, street trees, sidewalk and clearly define pedestrian crossing areas; shared access with interconnected parking and signage at edge.

More Attractive & Safer & Multimodal Roadways

Existing conditions – US 9

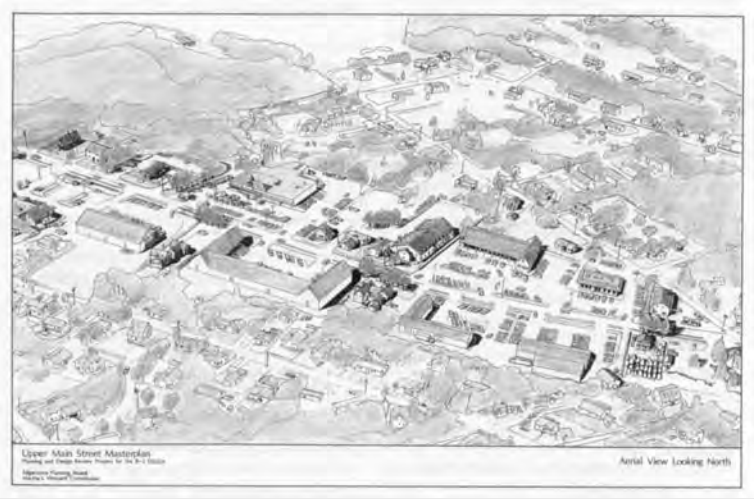
Phase I: Shorten & consolidated curb cuts, new curbing, painted center median, added green strip, improved sidewalks, new street trees

Phase II: New site furniture, including trash receptacles and pedestrian-scaled lighting, bus shelter.

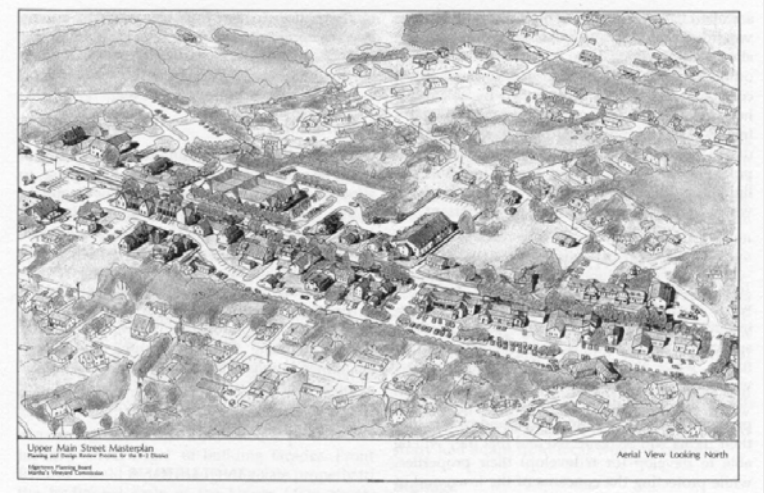


Phase III: Landscaped Median.

Activity Center – Auto Oriented Development



Activity Center – People Oriented Development



Costs of No Action

- Expensive road expansion projects needed to add capacity
- Leads to strip development
- More accidents
- Unhappy public
- Unattractive corridors
- Discourages Pedestrians and Bicyclists
- Does not provide easy access to transit service

Overall Benefits of Access Management

- Reduced Congestion
- Improved Safety
- Shorter Travel Times
- Positive Economic Benefits
- More Attractive Roadways
- Preserved Road Capacity
- Safer for Pedestrians and Bicyclists
- Improved access to transit

•50% Reduction in Crashes

•23-45% Increase in Roadway Capacity without adding through lanes

•40-60% Travel Time Savings

Source: *NCHRP Report 420: Impact of Access Management Techniques*

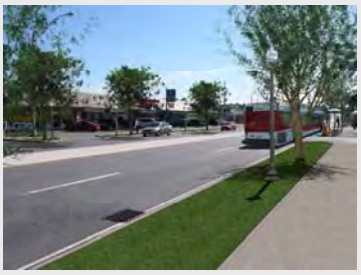
Access Management and Businesses

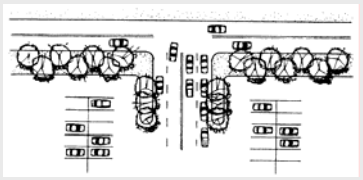
Developers/Business Owners

- Benefits of Access Management
- Implementation Examples
- Common Concerns
- Reduce Uncertainty

AM Business Benefits

- **Potential for Future Revenue Gains**
  - Increased market area due to reduced congestion
  - Maximize onsite vehicular capacity and parking
  - Improve the aesthetics along corridor
  - Improve vehicular capacity and safety of adjacent highway/roadway
  - Provide safe and efficient entrance
- **Reduce Uncertainty**
  - Design your site with proper access to avoid headaches later
  - More efficient permitting process





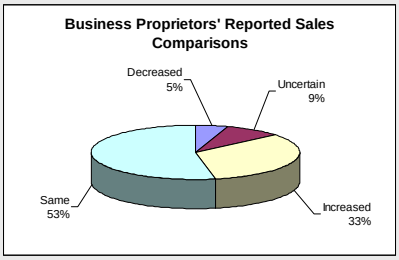
Attractive highways, and orderly and safe entrance is good for business.

Benefits for Businesses

- Increased market area due to decreased congestion and reduced travel times
- Safer and easier for customers to enter and exit your business
- Properly designed entrances shared by multiple businesses allow:
  - more site area for parking,
  - more customer options to access your business, and
  - improved landscaping or other site amenities
- Less Disruptive Alternative Than:
  - Taking land from business for more lanes
  - Building a bypass

Business Concerns

- **Affect on Business Activity**
  - Actual negative impacts to business activity less than anticipated by owners
  - Most adverse impacts were due to construction, not access change
- **Affect on Property Values**
  - Most property owners surveyed following an access management project do not report any adverse effect of the project on property values.



Source: "Safe Access is Good for Business"; USDOT, FHWA, August 2006

Common Business Concerns

- Will Access Management hurt my business?

"My wife and I started a petition to stop the [access management] construction and we got every business on the road to sign it. As I look back now, I was over-reacting. The road was a good project. If anything, our business increased after the project which very much surprised me."

Stanley Tripp
Tripp Auto Sales
Gray Court, South Carolina

Common Concerns – How Access Affects Business

- **Access is not the most important factor**
- **Lack of management expertise main reason for business failure**
- **Main factors in business success**
  - the experience of management,
  - how well customers are served,
  - the quality of the product or service provided,
  - adequate financing and investment,
  - well-trained employees,
  - the level and nature of competition, and
  - keeping costs competitive.

Sources: Cited in "Safe Access is Good for Business"; USDOT, FHWA, August 2006. Original sources are (1) USA Today, *Money*, 5/6/2004; (2) Holland, R., *Planning Against a Business Failure*, ADC Info #24, University of Tennessee, October 1998.

Business Issues - Summary

- Access management makes it easier and safer for customers, employees and trucks to reach your business.
- Reduce uncertainty by clarifying requirements.
- You, as a business owner, are powerful. By being proactive, you are more likely to reach a solution that better meets your needs and the needs of the community.

Access Management and Local Governments

Local Government

- Benefits
- Implementation through Land Use Planning
- Benefits of Coordinated Decision Making
- Implementing Access Management

Benefits to Local Governments

- Safety
- Reduced Congestion
- Sustainable Growth
- Improved Corridor Appearance

Benefits of Coordinated Decision Making

- **Who regulates access**:
  - NYSDOT
  - Counties
  - Municipalities
    - Public Works
    - Planning Boards

- **Issues and Opportunities**
  - **Prevents conflicts** between the community, developer and the access permitting authority.
  - **Builds** a **professional relationship** based on a common understanding of local road issues.
  - **Prevents** unnecessary **re-design** which typically results in **higher costs** to the permit applicant.

Access Guidelines & Requirements Case Studies

Jurisdiction	*Access Management Administration*
NYSDOT	▪Driveway Design Policy
Queensbury	▪Zoning Code Supports Access Management Principles ▪References NYSDOT Driveway Design Policy ▪Targeted at US 9, Quaker Road, and Dix Avenue
Kingsbury	▪No Specific Access Management Guidelines ▪**No reference to NYSDOT Driveway Design Policy**
Moreau	▪Subdivision regulations encourage access to side streets ▪**No reference to NYSDOT Driveway Design Policy**
Warren County	▪Adopted NYSDOT Driveway Design Policy
Washington County	▪No access guidelines except to verify adequate sight distance
Saratoga County	▪No access guidelines ▪White paper in support of shared driveways

How can you improve access management coordination?


NEW YORK STATE
DEPARTMENT OF TRANSPORTATION

POLICY and STANDARDS
for the Design of Entrances to State Highways

November 24, 2003

Also referred to as "Driveway Design Policy"

- Review the NYSDOT Driveway Design Policy
  - Do your local regulations reference this document?
- Contact NYSDOT
  - **Need contact name for AGFTC region**
- Contact the AGFTC
  - **Name and contact**

Implementing Access Management at the Local Level

- Initiate a Public Process
  - Solicit local input, gather local concerns, and distribute access management information
- Establish Access Management Regulations through:
  - Zoning Ordinances
  - Subdivision Site Plan Review Boards
  - Master Plans/Official Maps
  - Road/Transportation Ordinances
- Implement Access Management Regulations
  - Ensure that they are clear and applied equitably
  - Adopted by locally elected officials
- Cooperate
  - Ensure integration/communication between state officials, local officials, business owners, and residents

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Overall Summary

- **Access Management Can Be Good for Everyone**
  - Residents
  - Developers/Business Owners
  - Local Governments
  - Traveling Public
- **Here's how to get started:**
  - Review your local regulations
  - Initiate a Public Process
  - Establish Regulations
  - Implement Regulations
  - Ensure Cooperation among Stakeholders

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Additional Resources

- Website:
  http://www.accessmanagement.gov
- Transportation Research Board Manual:
  Access Management Manual, 2003
- Access Management Guidebook:
  AGFTC Access Management Guidebook
- National Highway Institute Course:
  http://www.nhi.fhwa.dot.gov

Resources

Access Management Performance Studies

- National Study (NCHRP 420) of Raised Median vs. Undivided or Two-way Left Turn Lanes (TWLTL) – Economic Impacts and Shopping Patterns, 1999
- Kansas DOT – Economic Impacts of Access Management on Businesses
- Florida – Oakland Park Blvd. – Economic Impacts of Access Management on Businesses
- Memorial Drive – Atlanta, Georgia – Raised Median vs. TWLTL
- Minnesota DOT – Intersection Spacing and Safety Shorter Travel Times
- US 101, Oregon – Raised Medians and Crash Rates
- Florida DOT – Driveway Spacing and Travel Speeds
- Atlanta, GA; Phoenix, AZ; and Los Angeles, CA – Pedestrian Safety with Raised Median vs. Undivided or TWLTL
- Texas – Signal Spacing with Turn Bays and Fuel Consumption

Access Management Manual, TRB, 2003

Contacts

[Presenter]

[Organization]

[Address]

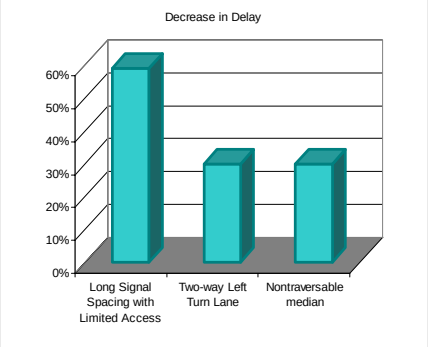
[Phone]

[Email]

[Organization Website]

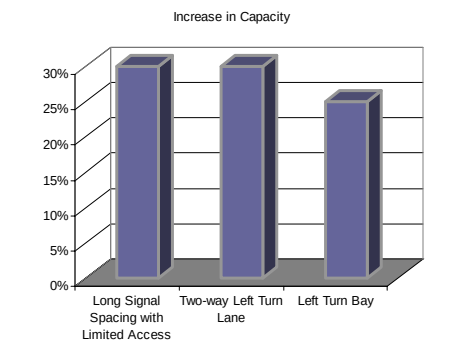
Appendix
ACCESS MANAGEMENT BENEFITS FACT SLIDES

Reduced Congestion



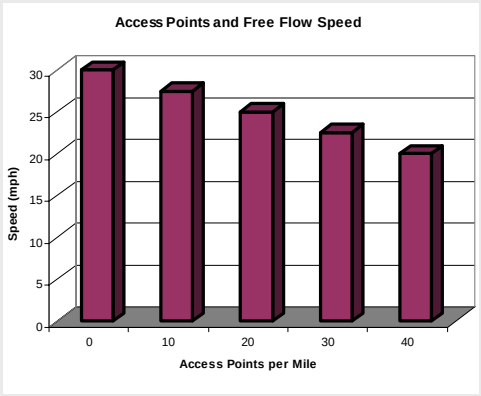
Data: Access Management Manual, TRB, 2003

Reduced Congestion



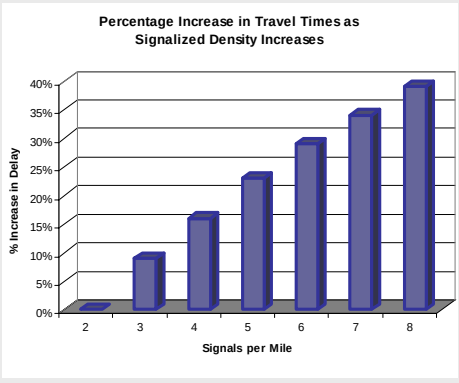
Data: Access Management Manual, TRB, 2003

Shorter Travel Times



Data: Access Management Manual, TRB, 2003

Shorter Travel Times



Data: Access Management Manual, TRB, 2003

Impact on Property values

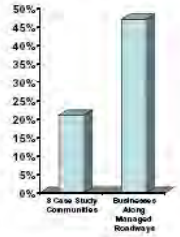
A study of property values on **Texas** corridors with access management projects found that land values stayed the same or increased, with very few exceptions *(7)*.	More than 70% of the businesses impacted by a project in **Florida** involving several median opening closures reported no change in property value, while 13% reported some increase in value *(8)*.
A 2005 study of commercial property values along a major access management project in **Minnesota** found that property values depend more on the strength of the local economy and the general location of the property in the metropolitan area; changes in access seemed to have little or no effect on the value of parcels *(9)*.	A study of **Kansas** properties impacted by access changes found that the majority were suitable for the same types of commercial uses after the access management project was completed. This was true even for businesses that had direct access before the project and access only via frontage roads after project completion *(10)*.

Source: Safe Access is Good for Business; US DOT, FHWA, August 2006, FHWA-HOP-06-107 EDL 14294

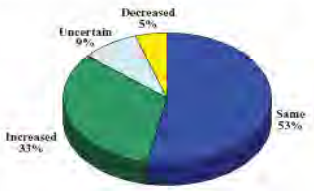
Impact on Sales and Business Activity

Businesses affected by access management projects in Iowa tended to do at least as well in terms of growth in retail sales, but usually better than those in surrounding communities, after the projects were completed. Most of these Iowa business proprietors said that sales were similar or greater following the completion of the projects. Only five percent reported a sales decrease *(6)*.

Impact of Access Management on Retail Sales Growth

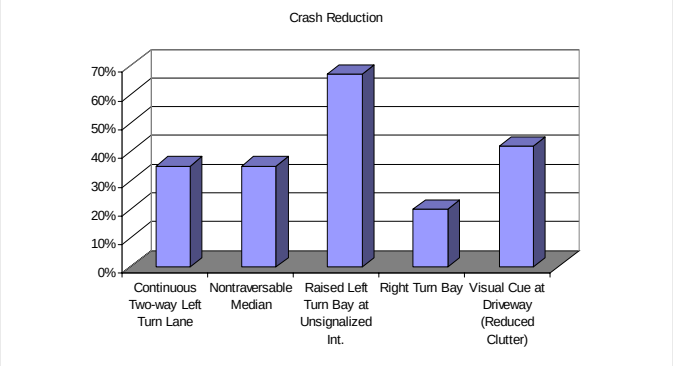


Business Proprietors' Reported Sales Comparisons



Source: Safe Access is Good for Business; US DOT, FHWA, August 2006, FHWA-HOP-06-107 EDL 14294

Safer Roads



Data: Access Management Manual, TRB, 2003

A/GFTC Adirondack Glens Falls Transportation Council

Access Management Slide Show

Prepared by:

Presentation Outline

- AM Overview and Goals
  - Examples of AM Techniques
  - General Benefits and Implications of No Action
- AM and Businesses
- AM and Local Governments

Goals of Presentation

- Describe the basics of access management (AM)
- Explain the importance and benefits of AM
- Show how AM is implemented
- Address your concerns and questions
- How to find out more

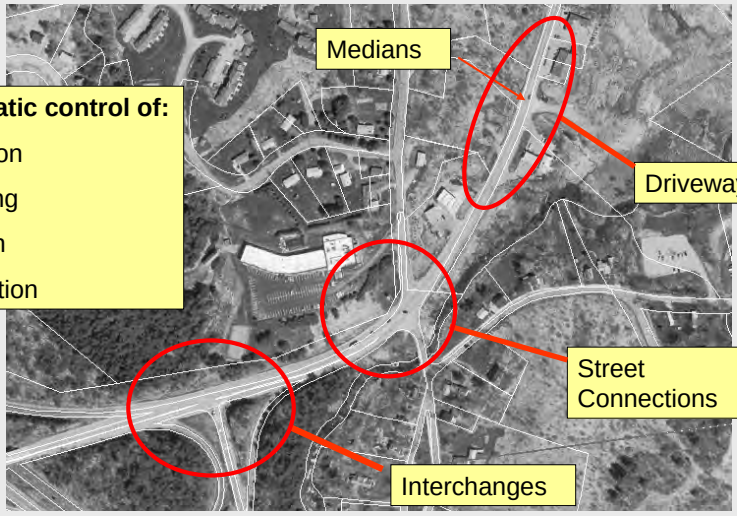
When people leave this session they should be able to do each of the tasks shown above.

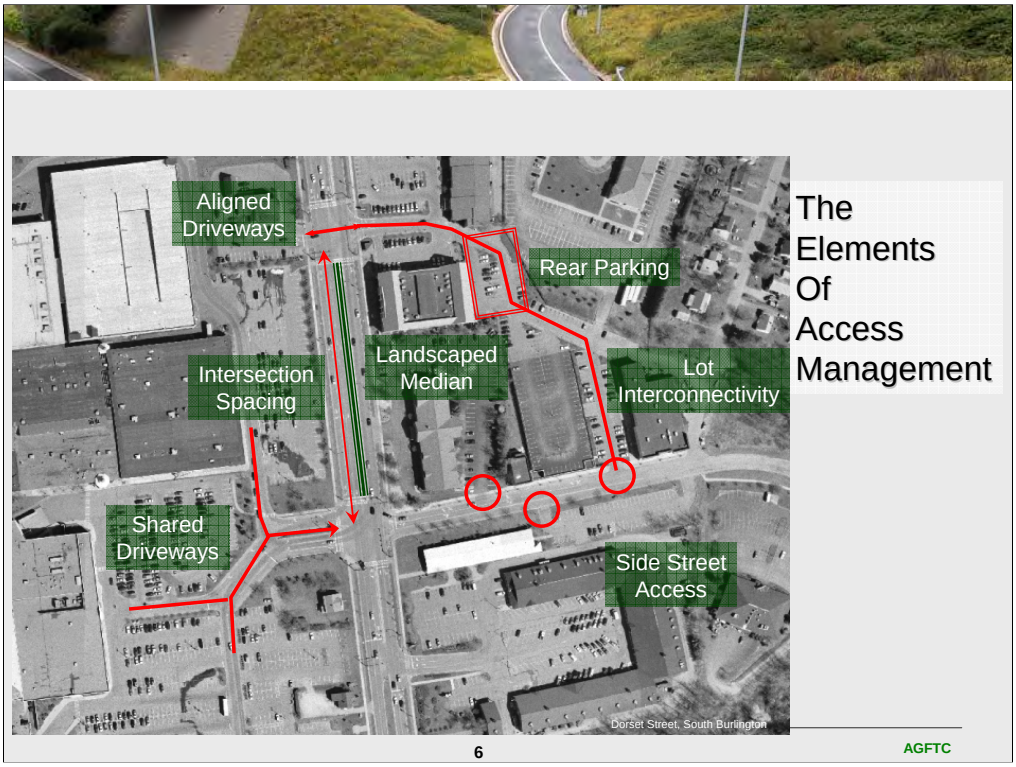
Access Management Overview

What is Access Management?

Systematic control of:

- Location
- Spacing
- Design
- Operation

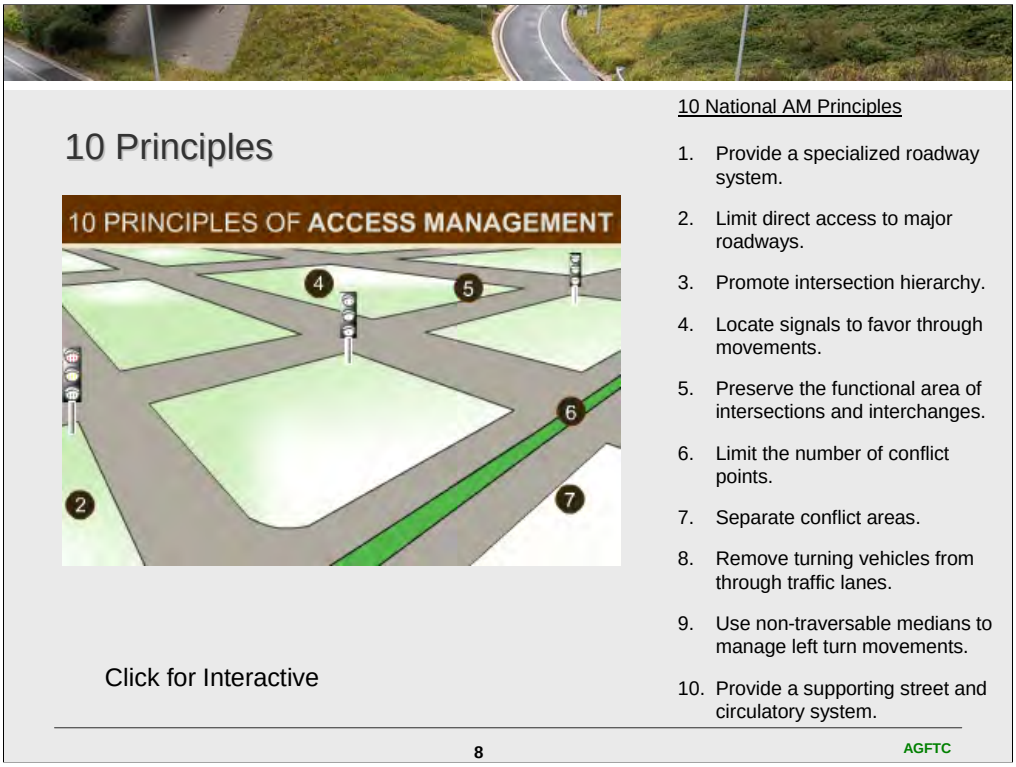




[Tell the audience that they are already familiar with many of the techniques used to implement Access Management. In shorter presentations where you do not go through the techniques, talk about some of them in detail on this slide.]

Goals of Access Management

- Improve safety for all road users
- Provide:
  - safe and efficient access to adjacent properties; and
  - mobility for through traffic
- Preserve roadway capacity and ability to accommodate economic development
- Create more attractive roadways
- Support smart growth land development
  - Interconnected street system
  - Access for pedestrians and cyclists
  - Access to transit



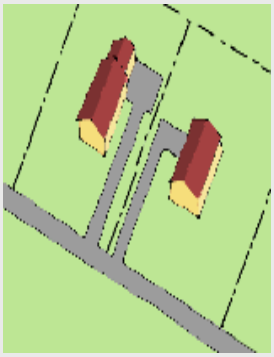
[You likely just want to tell the audience that this exists, but if you have time, you may want to show them 1 or 2 especially if they had a specific question about a topic.]

10 National AM Principles

1. Provide a specialized roadway system.
2. Limit direct access to major roadways.
3. Promote intersection hierarchy.
4. Locate signals to favor through movements.
5. Preserve the functional area of intersections and interchanges.
6. Limit the number of conflict points.
7. Separate conflict areas.
8. Remove turning vehicles from through traffic lanes.
9. Use non-traversable medians to manage left turn movements.
10. Provide a supporting street and circulatory system.

Examples of Access Management

- Shared Driveways



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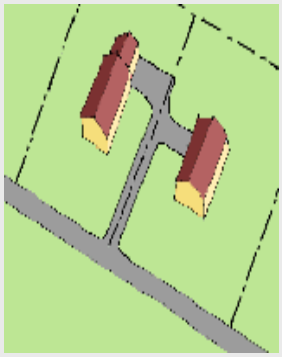


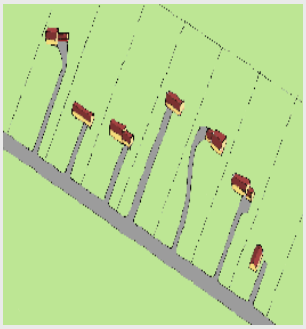
Preferred

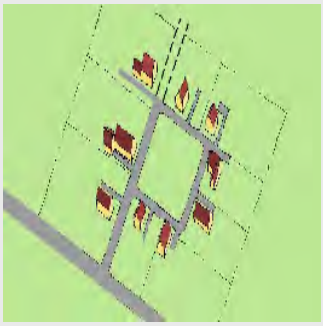
Images: Access Management Guidebook, Northwest Regional Planning Commission and Humstone & Campoli, 1996.

Consolidating driveways reduces the number of access points along the roadway and provides additional green space for each property owner.

Examples of Access Management

- Cluster Development with Single Access





Avoid **Preferred**

Images: Access Management Guidebook, Northwest Regional Planning Commission and Humstone & Campoli, 1996.

10

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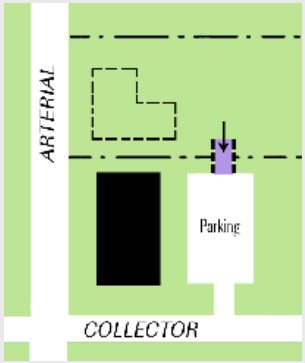
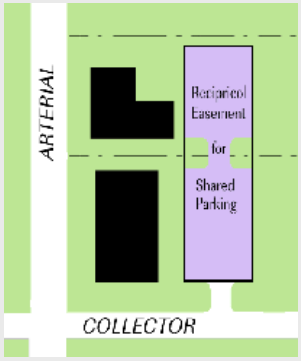
To limit the number of curb cuts on a roadway, AM should be incorporated into the subdivision and site plan review process. The A/GFTC Access Management Guidebook provides sample regulations. Parcels should be subdivided into lots that do not require direct access to the road. Access should be provided through a shared driveway or new frontage road.

Examples of Access Management

- Create Access Easements



Starting Condition



Share Side Street Access

Images: Access Management Guidebook, Northwest Regional Planning Commission and Humstone & Campoli, 1996.

11

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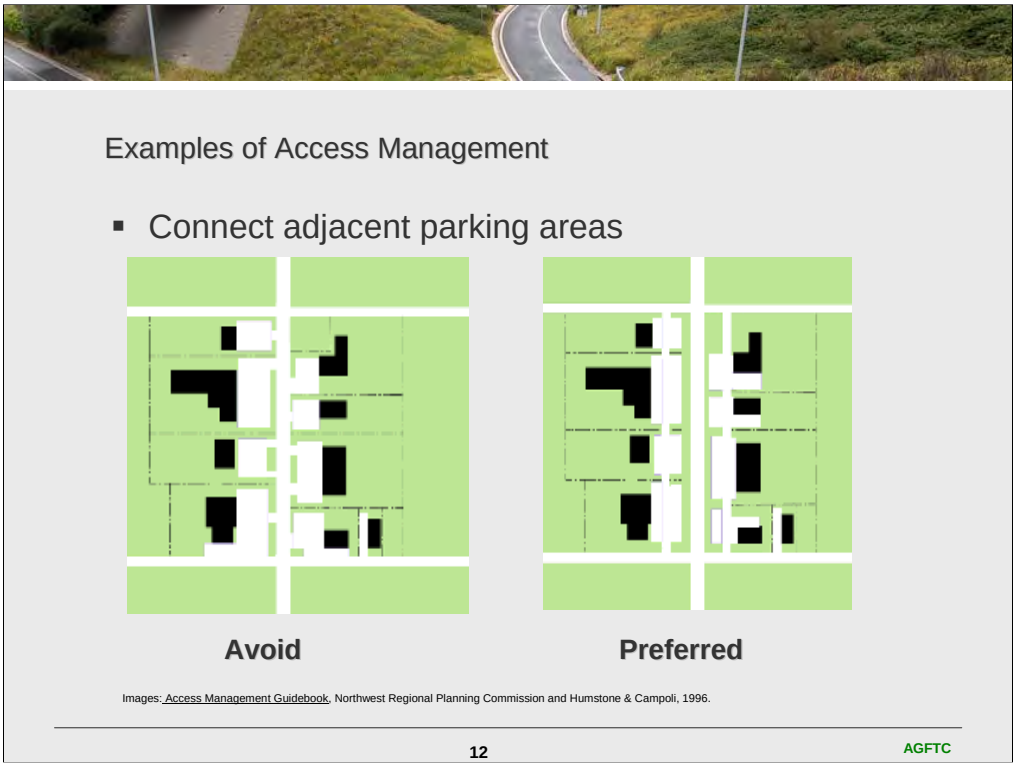
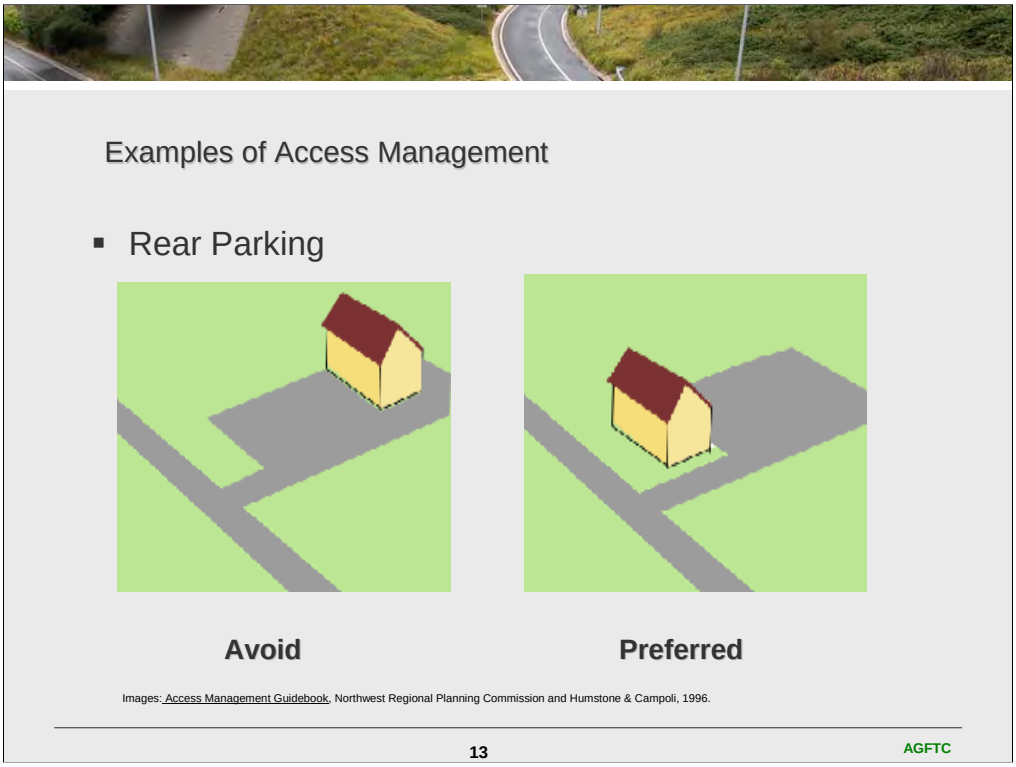
With future development, access between lots should be purchased to allow for shared parking and consolidated access between the parcels. See sample regulations in guidebook.



Once the right of way is purchased, interconnected non-residential sites allow employees and customers to move from site to site without repeatedly entering and exiting the arterial. Since there are fewer access points and turning movements along the highway both road capacity and safety increase. Additionally, green space along the highway is opened up for landscaping and pedestrian walkways creating a more aesthetically pleasing and safer corridor.

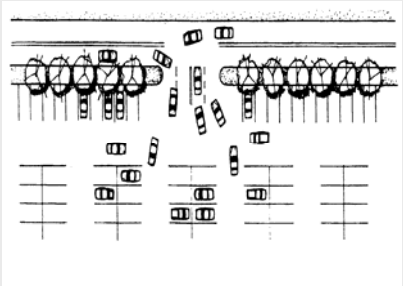


Commercial parking should be located to the rear of the building. This location provides a clear driveway access which separates entering and exiting turning movements from parking related turning movements. This also allows the building to move closer to the roadway, creating a more pedestrian friendly and inviting corridor.

Examples of Access Management

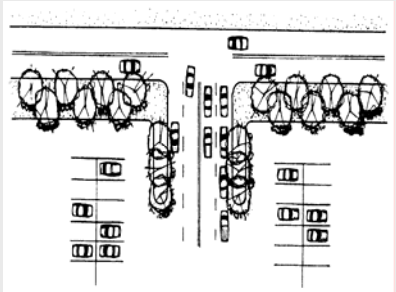
- Throat Length

Difficult and Confusing



Avoid

Orderly and Safe



Preferred

Images: Route 16 Corridor Protection Study – Access Management, Strafford Regional Planning Commission, 1998

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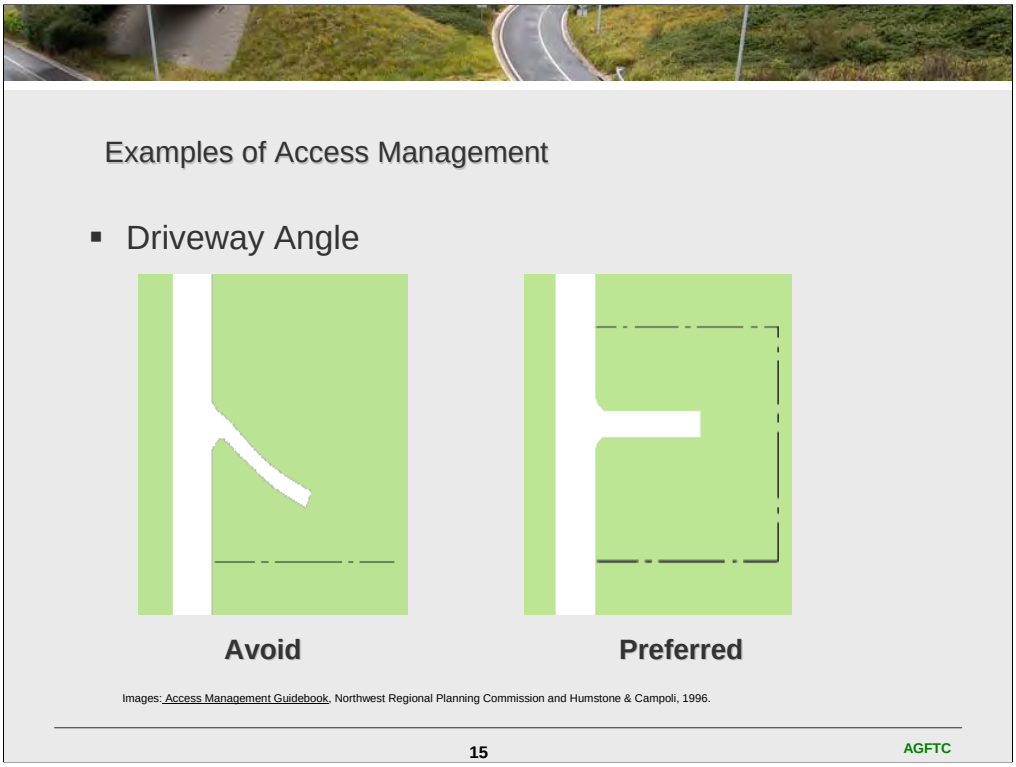
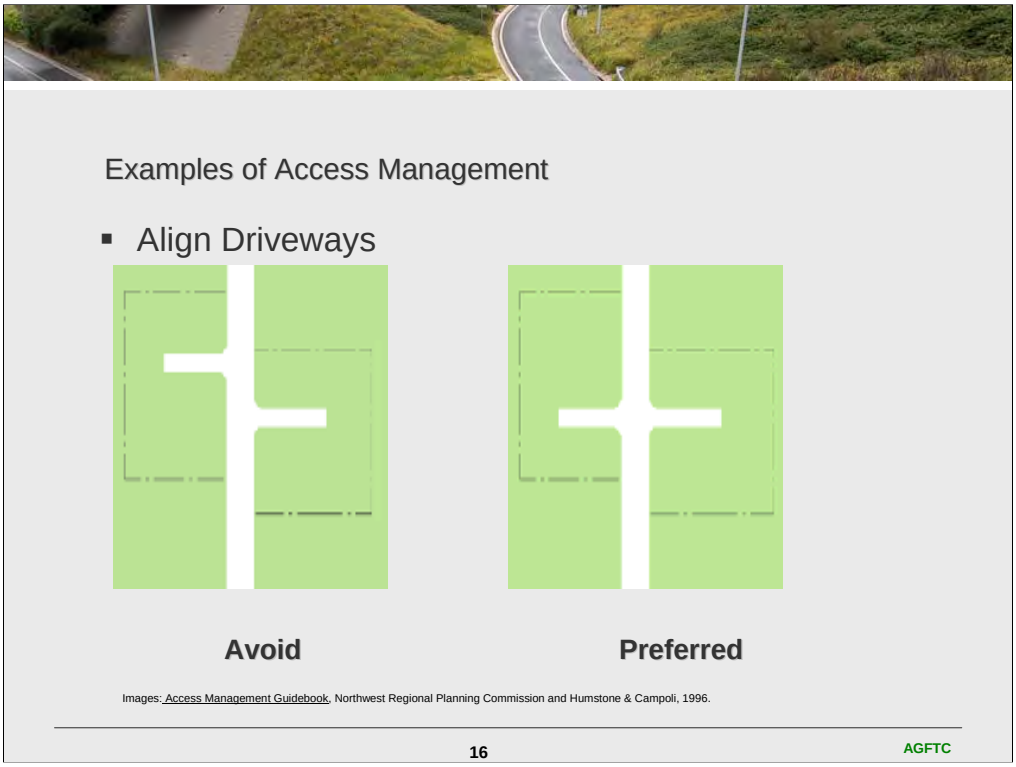
By providing adequate depth, or throat length, at the driveway entrance, vehicles are allowed sufficient maneuvering space on-site to move away from the entrance and allow other vehicles to efficiently enter or exit the site.



A good intersection line of sight is critical to preventing crashes at driveways. This is not only important in developed areas, but also critical in rural areas as driver speeds can be unpredictable.

Two-way driveways should intersect the roadway at an angle between 70-90 degrees. A sharply skewed angle makes it more difficult for the driver to see oncoming traffic from one direction. The sharp angle is also more difficult to enter from the main roadway.



Imagine yourself as a driver leaving one of the properties shown in the “Avoid” scenario. As soon as you enter the roadway, you need to be ready to react to vehicles entering and exiting the next driveway on the opposite side of the road. Unless there is enough separation, you may not have enough time to react. Driveways on opposite sides of a road should be separated by a distance equal to the stopping sight distance (Rule of thumb: stopping sight distance in feet = posted speed x 11). When it is not possible to provide adequate separation, the driveways should be aligned.

Examples of Access Management

- Separate turning traffic

Left Turn Pocket

Two way Left-turn Lane

Two good alternatives

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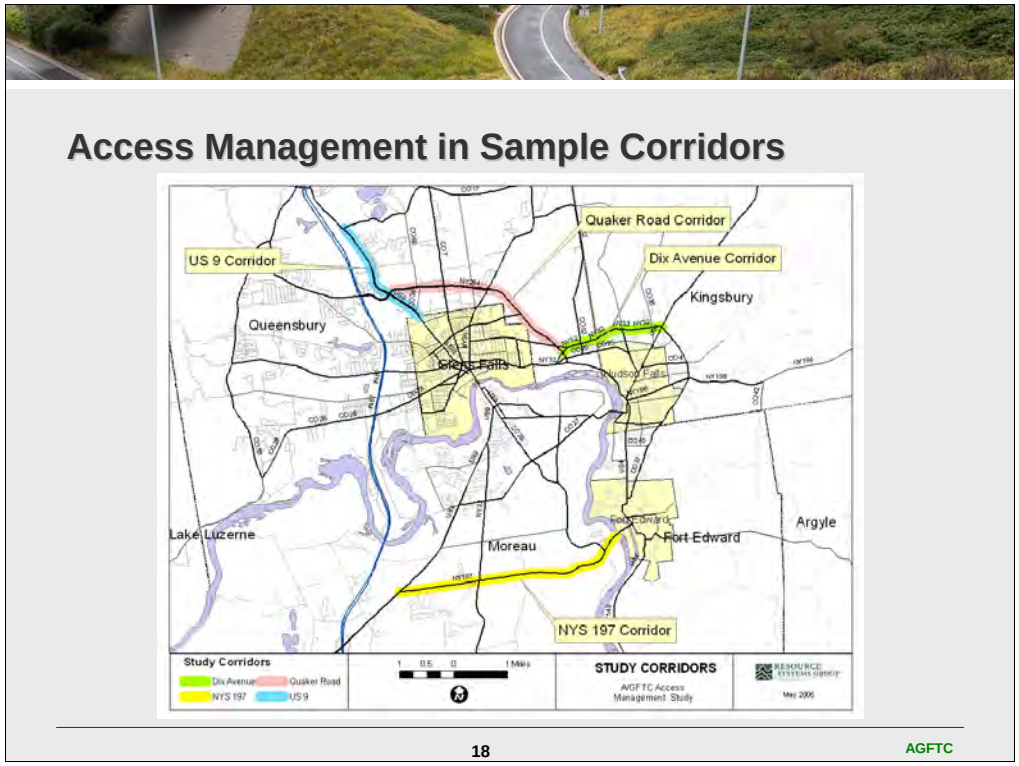
A left turn pocket separates left turning vehicles from the through lane, allowing through traffic to maintain speed and reducing conflicts between through traffic and turning traffic.

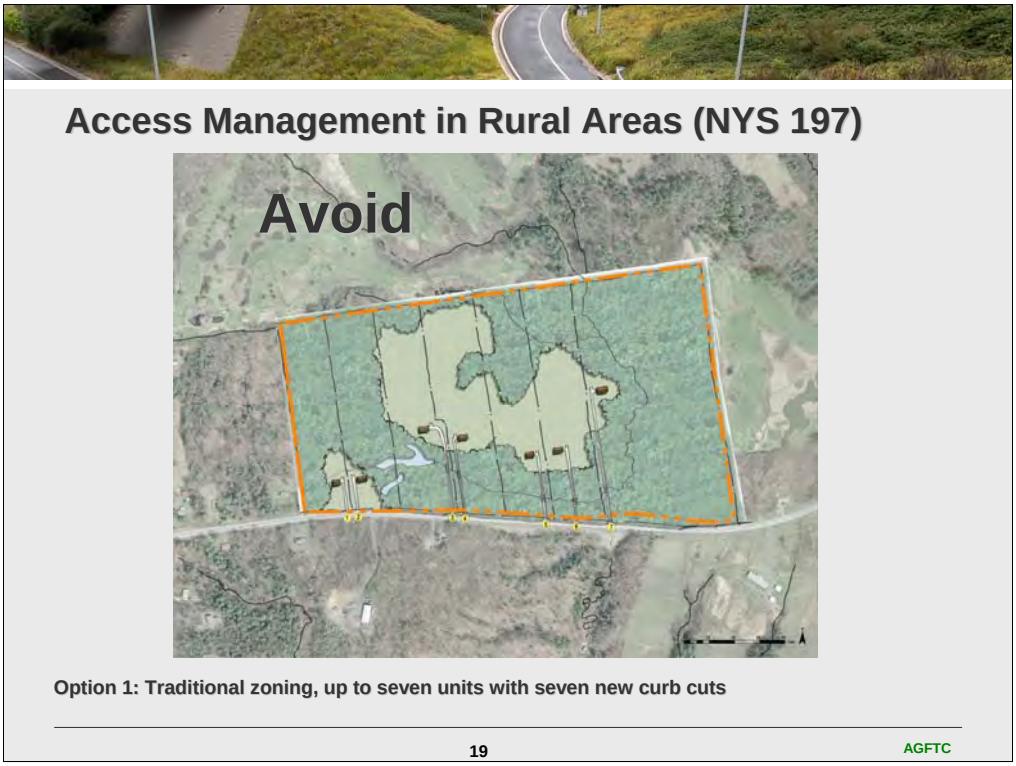
Two-way left turn lanes provide a continuous left turn pocket that separates through traffic from left turning traffic. (Queensbury – US 9 Outlet Centers – between I-87 Exit 20 and NYS 197)



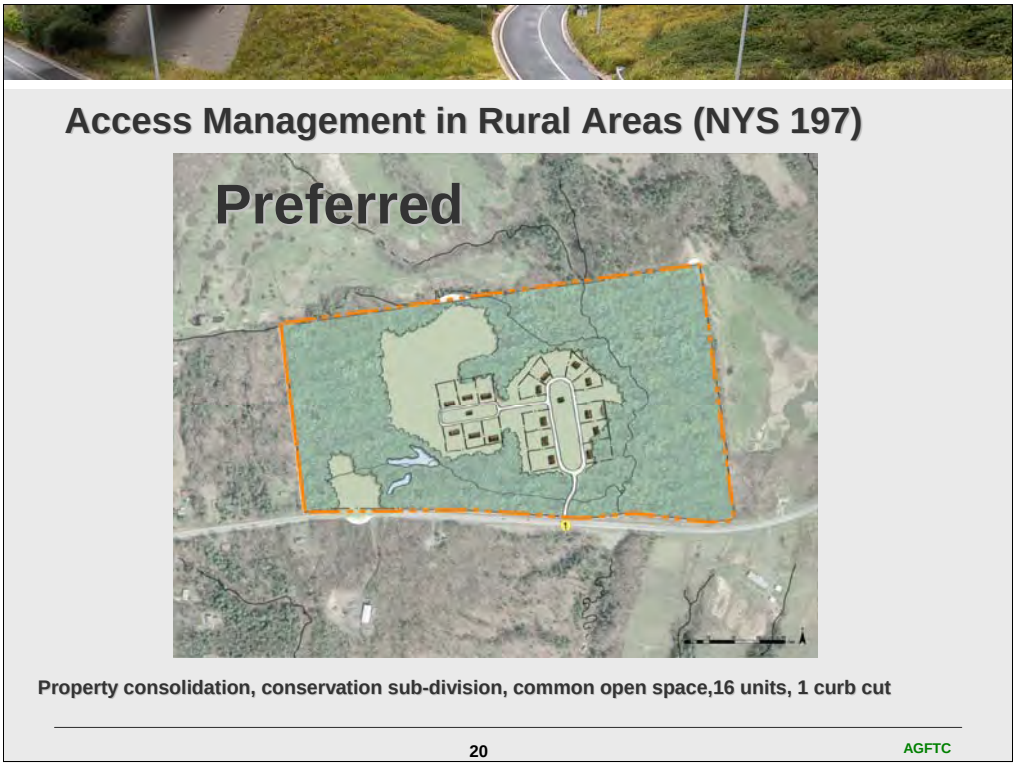
The A/GFTC Access Management study includes four case studies in highway corridors surrounding Glens Falls. The visualizations n the following slides provide examples of how access management strategies can be applied in each corridor.

The complete study, which is available at the A/GFTC, includes an analysis of existing and future conditions, evaluates access management strategies, and discusses implementation methods and funding. The following slides provides visualizations that show the application of access management techniques in each corridor.

An overview of the case studies is included in the Guidebook. For additional information, review the completed report – *A/GFTC Access Management Study*



This slide shows how a large parcel along the NYS 197 corridor could develop under existing zoning which allows the conventional approach to rural residential development. Each parcel has a separate driveway on the arterial roadway. It is based on current zoning in the Town of Moreau.



This slide shows a development scenario that allows clustered homes, higher densities, and conserved open space. The number of dwelling units has doubled but only one curb cut is necessary. This option also conserves more open space and maintains the rural feel of the roadway. Proper foresight and planning in rural areas can provide for shared driveways, particularly along rural arterial roadways.

This area along Quaker Road is located between Meadowbrook and Everts Avenues. There are multiple access points for the parcels in this aerial photograph and a lack of connectivity between the lots.

AM in Transitional Area – Quaker Road

Improvements: Primary access consolidated on Quaker Rd, secondary access from Meadowbrook Ave. and Everts Ave., interconnected shared parking, landscaping along road, sidewalks, bus stop

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See note at bottom of slide.

AM in Suburban/Urban Area - Dix Ave

Existing Conditions – Undefined curb cut, driveways too close to intersection, no sidewalks

Dix Ave Visualization Area

Create definition to parking areas; add bike lane, curbing, street trees, sidewalk and clearly define pedestrian crossing areas; shared access with interconnected parking and signage at edge.

More Attractive & Safer & Multimodal Roadways

Existing conditions – US 9

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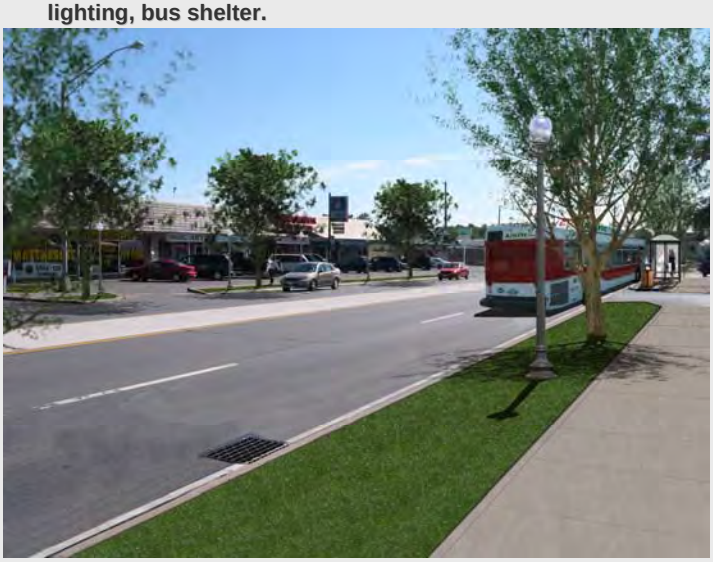
These next few slides show how access management can enhance the aesthetics of a highway while also improving access and mobility for pedestrians, cyclists, and transit users.

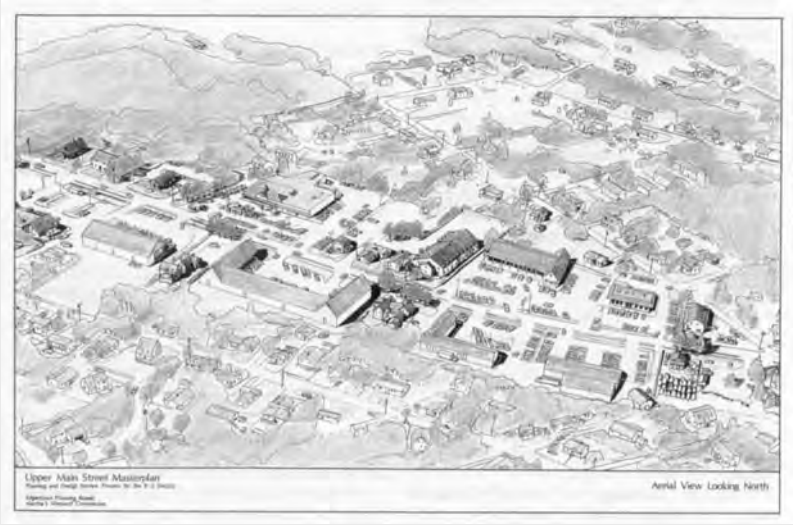
Phase I: Shorten & consolidated curb cuts, new curbing, painted center median, added green strip, improved sidewalks, new street trees

Phase II: New site furniture, including trash receptacles and pedestrian-scaled lighting, bus shelter.



Phase III: Landscaped Median.

Activity Center – Auto Oriented Development



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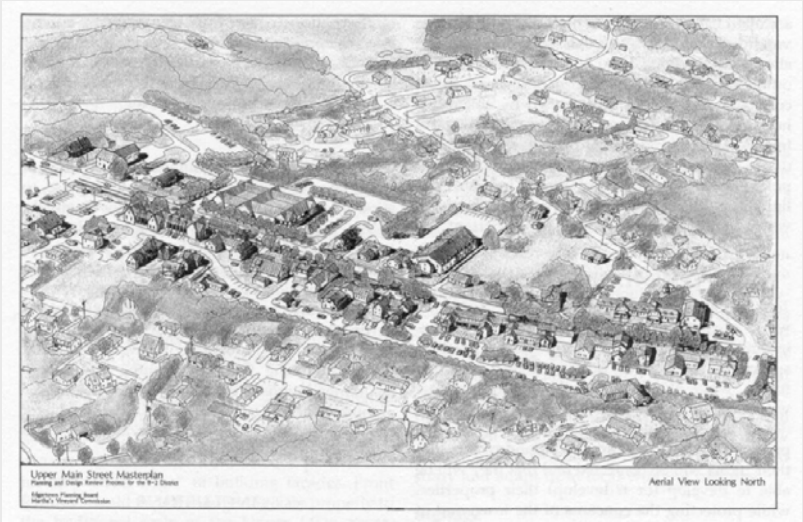
Automobile oriented development. Parking in front of buildings, multiple curb cuts. This type of development pattern provides a reasonable level of accessibility for vehicles, but is less accessible to pedestrians and cyclists.

Activity Center – People Oriented Development



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Buildings that are close to the street are much more accessible to pedestrians. Pedestrians do not have to cross a large expanse of pavement to reach their destination. This option includes landscaping, small public spaces and pedestrian scale lighting that make it oriented towards people. It continues to provide a high level of access and connectivity for vehicles with a rear service road connected to the Main Street with periodic streets.

Costs of No Action

- Expensive road expansion projects needed to add capacity
- Leads to strip development
- More accidents
- Unhappy public
- Unattractive corridors
- Discourages Pedestrians and Bicyclists
- Does not provide easy access to transit service

[If you have a good local picture feel free to insert it]

Overall Benefits of Access Management

- Reduced Congestion
- Improved Safety
- Shorter Travel Times
- Positive Economic Benefits
- More Attractive Roadways
- Preserved Road Capacity
- Safer for Pedestrians and Bicyclists
- Improved access to transit

•50% Reduction in Crashes

•23-45% Increase in Roadway Capacity without adding through lanes

•40-60% Travel Time Savings

Source: *NCHRP Report 420: Impact of Access Management Techniques*

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Poorly designed vehicular access not only adversely affects roadway safety and efficiency, but it could also reduce the economic vitality of the corridor. Good access management along US 9 supports access to the outlet centers, provides mobility for through traffic, and accommodates pedestrians.

Access Management and Businesses

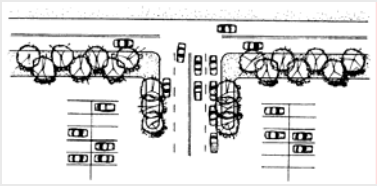
Developers/Business Owners

- Benefits of Access Management
- Implementation Examples
- Common Concerns
- Reduce Uncertainty

Information presented in this section is included in the Safe Access is Good For Business included in the AGFTC Access Management Guidebook.

AM Business Benefits

- **Potential for Future Revenue Gains**
  - Increased market area due to reduced congestion
  - Maximize onsite vehicular capacity and parking
  - Improve the aesthetics along corridor
  - Improve vehicular capacity and safety of adjacent highway/roadway
  - Provide safe and efficient entrance
- **Reduce Uncertainty**
  - Design your site with proper access to avoid headaches later
  - More efficient permitting process



Attractive highways, and orderly and safe entrance is good for business.

Benefits for Businesses

- Increased market area due to decreased congestion and reduced travel times
- Safer and easier for customers to enter and exit your business
- Properly designed entrances shared by multiple businesses allow:
  - more site area for parking,
  - more customer options to access your business, and
  - improved landscaping or other site amenities
- Less Disruptive Alternative Than:
  - Taking land from business for more lanes
  - Building a bypass

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The graphic demonstrates several of the listed benefits:

-This site is easy to access and the parking and internal circulation do not conflict with the entrances.

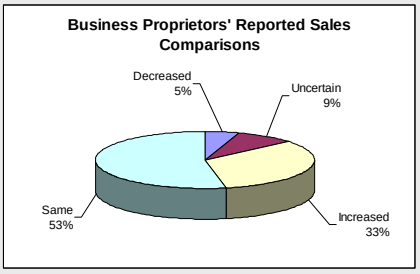
-Shared parking reduces the total amount of parking necessary of all uses were on un-connected lots

-More landscaping and amenities are possible

-Reduces driveways on the arterial which improves safety and preserves travel time for through traffic.

Business Concerns

- **Affect on Business Activity**
  - Actual negative impacts to business activity less than anticipated by owners
  - Most adverse impacts were due to construction, not access change
- **Affect on Property Values**
  - Most property owners surveyed following an access management project do not report any adverse effect of the project on property values.



Source: "Safe Access is Good for Business"; USDOT, FHWA, August 2006

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Location and access are factors to the success of a business, but not the most important factors that determine whether businesses succeed or fail. The main reason that businesses fail is lack of management expertise *(3)*. The main reasons that businesses succeed include *(4)*:

- the experience of management,
- how well customers are served,
- the quality of the product or service provided,
- adequate financing and investment,
- well-trained employees,
- the level and nature of competition, and
- keeping costs competitive.

Common Business Concerns

- Will Access Management hurt my business?

"My wife and I started a petition to stop the [access management] construction and we got every business on the road to sign it. As I look back now, I was over-reacting. The road was a good project. If anything, our business increased after the project which very much surprised me."

Stanley Tripp
Tripp Auto Sales
Gray Court, South Carolina

"My wife and I started a petition to stop the [access management] construction and we got every business on the road to sign it. As I look back now, I was over-reacting. The road was a good project. If anything, our business increased after the project which very much surprised me."

Stanley Tripp

Tripp Auto Sales

Gray Court, South Carolina

Common Concerns – How Access Affects Business

- **Access is not the most important factor**
- **Lack of management expertise main reason for business failure**
- **Main factors in business success**
  - the experience of management,
  - how well customers are served,
  - the quality of the product or service provided,
  - adequate financing and investment,
  - well-trained employees,
  - the level and nature of competition, and
  - keeping costs competitive.

Sources: Cited in "Safe Access is Good for Business"; USDOT, FHWA, August 2006. Original sources are (1) USA Today, *Money*, 5/6/2004; (2) Holland, R., *Planning Against a Business Failure*, ADC Info #24, University of Tennessee, October 1998.

Business Issues - Summary

- Access management makes it easier and safer for customers, employees and trucks to reach your business.
- Reduce uncertainty by clarifying requirements.
- You, as a business owner, are powerful. By being proactive, you are more likely to reach a solution that better meets your needs and the needs of the community.

[Stress that they can make a difference by getting involved]

Access Management and Local Governments

Local Government

- Benefits
- Implementation through Land Use Planning
- Benefits of Coordinated Decision Making
- Implementing Access Management

[These are the topics we will discuss in the local government sections]

Benefits to Local Governments

- Safety
- Reduced Congestion
- Sustainable Growth
- Improved Corridor Appearance

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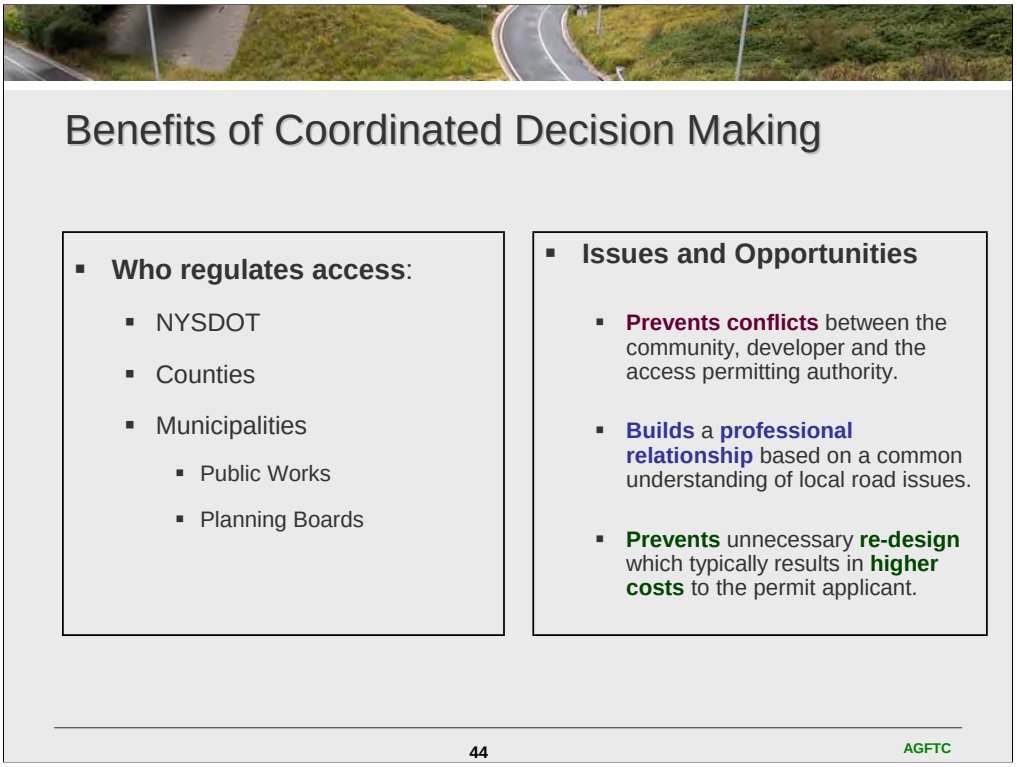
Safety – Good for everyone – residents, visitors, and businesses. Less demand for emergency services

Reduced Congestion: Requires less public funds for capacity expansion

Sustainable growth: Allows growth to continue, even at higher densities, allowing grand list to grow

Improved Corridor Appearance – Attracts more businesses and visitors



Example Conflicts:

•Driveway permit was issued by NYSDOT before site plan review.

•The Community approved a site plan or building permit before determining if a driveway permit had been issued.

•The Community issued a building permit without requiring setback from the highway.

Benefits

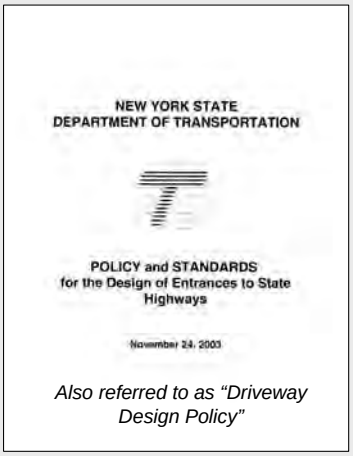
•Professional relationship between NYSDOT and community planners

•Ease in permitting process and happier applicants

Access Guidelines & Requirements Case Studies

Jurisdiction	*Access Management Administration*
NYSDOT	▪Driveway Design Policy
Queensbury	▪Zoning Code Supports Access Management Principles ▪References NYSDOT Driveway Design Policy ▪Targeted at US 9, Quaker Road, and Dix Avenue
Kingsbury	▪No Specific Access Management Guidelines ▪**No reference to NYSDOT Driveway Design Policy**
Moreau	▪Subdivision regulations encourage access to side streets ▪**No reference to NYSDOT Driveway Design Policy**
Warren County	▪Adopted NYSDOT Driveway Design Policy
Washington County	▪No access guidelines except to verify adequate sight distance
Saratoga County	▪No access guidelines ▪White paper in support of shared driveways

How can you improve access management coordination?



Also referred to as "Driveway Design Policy"

- Review the NYSDOT Driveway Design Policy
  - Do your local regulations reference this document?
- Contact NYSDOT
  - **Need contact name for AGFTC region**
- Contact the AGFTC
  - **Name and contact**

Make contact with NYSDOT

Implementing Access Management at the Local Level

- Initiate a Public Process
  - Solicit local input, gather local concerns, and distribute access management information
- Establish Access Management Regulations through:
  - Zoning Ordinances
  - Subdivision Site Plan Review Boards
  - Master Plans/Official Maps
  - Road/Transportation Ordinances
- Implement Access Management Regulations
  - Ensure that they are clear and applied equitably
  - Adopted by locally elected officials
- Cooperate
  - Ensure integration/communication between state officials, local officials, business owners, and residents

Overall Summary

- **Access Management Can Be Good for Everyone**
  - Residents
  - Developers/Business Owners
  - Local Governments
  - Traveling Public
- **Here's how to get started:**
  - Review your local regulations
  - Initiate a Public Process
  - Establish Regulations
  - Implement Regulations
  - Ensure Cooperation among Stakeholders

Additional Resources

- Website:
  http://www.accessmanagement.gov
- Transportation Research Board Manual:
  Access Management Manual, 2003
- Access Management Guidebook:
  AGFTC Access Management Guidebook
- National Highway Institute Course:
  http://www.nhi.fhwa.dot.gov

Resources

Access Management Performance Studies

- National Study (NCHRP 420) of Raised Median vs. Undivided or Two-way Left Turn Lanes (TWLTL) – Economic Impacts and Shopping Patterns, 1999
- Kansas DOT – Economic Impacts of Access Management on Businesses
- Florida – Oakland Park Blvd. – Economic Impacts of Access Management on Businesses
- Memorial Drive – Atlanta, Georgia – Raised Median vs. TWLTL
- Minnesota DOT – Intersection Spacing and Safety Shorter Travel Times
- US 101, Oregon – Raised Medians and Crash Rates
- Florida DOT – Driveway Spacing and Travel Speeds
- Atlanta, GA; Phoenix, AZ; and Los Angeles, CA – Pedestrian Safety with Raised Median vs. Undivided or TWLTL
- Texas – Signal Spacing with Turn Bays and Fuel Consumption

Access Management Manual, TRB, 2003

Before and After studies of AM projects have been performed in these states.

[Read Chapter 2 of the TRB Access Management Manual for additional information.]

Contacts

[Presenter]

[Organization]

[Address]

[Phone]

[Email]

[Organization Website]

Appendix
ACCESS MANAGEMENT BENEFITS FACT SLIDES

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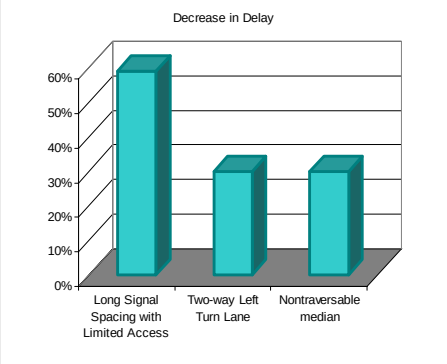
Property values tend to increase rapidly during commercial development, but can decline after the area is built out, if the character and efficiency of that corridor have been damaged in the process. This is exemplified by the growing number of older commercial strips across the country that are experiencing economic decline.

As shown here, as travel speed on corridors decreases, driver frustration increases and the relative market area for businesses decreases.

AM techniques can decrease congestion and driver frustration thereby increasing the market area.

Reduced Congestion

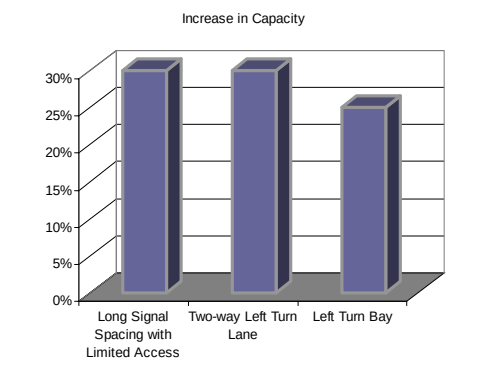


Data: Access Management Manual, TRB, 2003

Frequent access points and closely spaced traffic signals are a recipe for congestion on major roadways.

You can decrease delay and increase capacity by implementing AM strategies.

Reduced Congestion



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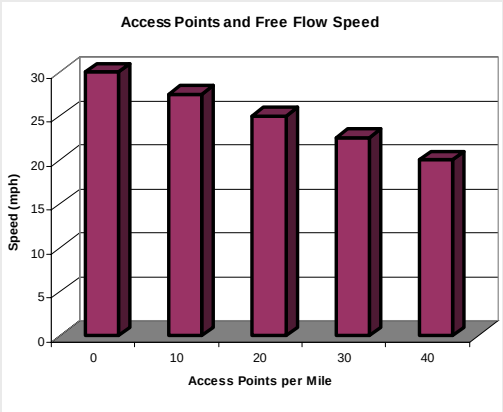
Shorter Travel Times



Data: Access Management Manual, TRB, 2003

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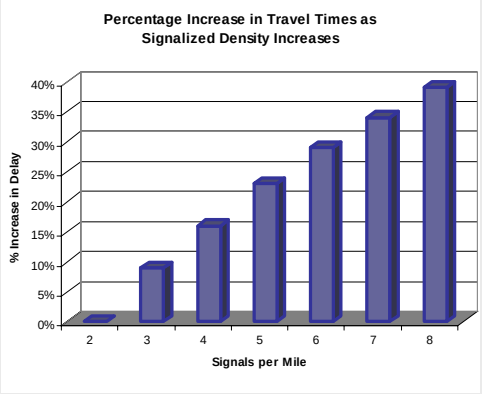
AGFTC

Studies of the effects of AM on roadway operations indicate that AM helps to maintain desired speeds, reduces delays and driver frustration.

Shorter Travel Times



Data: Access Management Manual, TRB, 2003

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AGFTC

Studies of the effects of AM on roadway operations indicate that AM helps to maintain desired speeds, reduces delays and driver frustration.

Impact on Property values

A study of property values on **Texas** corridors with access management projects found that land values stayed the same or increased, with very few exceptions *(7)*.	More than 70% of the businesses impacted by a project in **Florida** involving several median opening closures reported no change in property value, while 13% reported some increase in value *(8)*.
A 2005 study of commercial property values along a major access management project in **Minnesota** found that property values depend more on the strength of the local economy and the general location of the property in the metropolitan area; changes in access seemed to have little or no effect on the value of parcels *(9)*.	A study of **Kansas** properties impacted by access changes found that the majority were suitable for the same types of commercial uses after the access management project was completed. This was true even for businesses that had direct access before the project and access only via frontage roads after project completion *(10)*.

Source: Safe Access is Good for Business; US DOT, FHWA, August 2006, FHWA-HOP-06-107 EDL 14294

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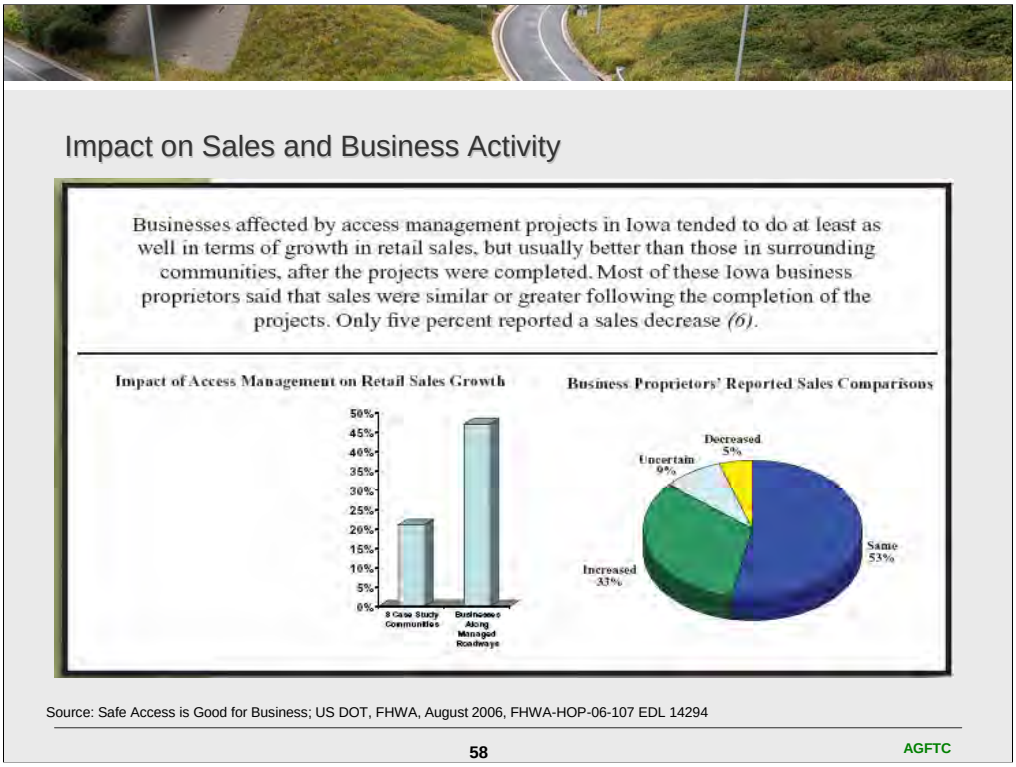
The National Highway Traffic Safety Administration reports that 41,611 people lost their lives in motor vehicle crashes in the US in 1999 – an average of 114 persons per day. Another 3 million were injured, and 4 million crashes resulted in property damage only. Many of those crashes could have been prevented through access management.

The chart shows the average reduction in crashes seen after the implementation of several common AM techniques.



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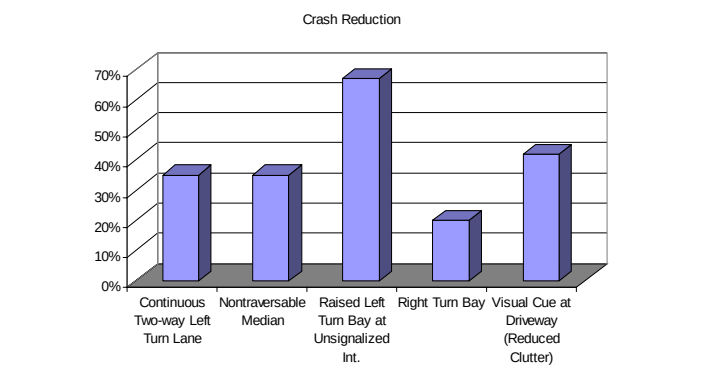
Safer Roads



Data: Access Management Manual, TRB, 2003

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The chart shows the average reduction in crashes seen after the implementation of several common AM techniques.

ACCESS MANAGEMENT & TRANSIT VEHICLES, BICYCLISTS AND PEDESTRIANS

Discussion and analysis of access management techniques is often focused on safety and efficiency for vehicular travel. However, most street systems also accommodate travel by pedestrians, cyclists, and passengers in transit vehicles. Different access management techniques change the design and environment of the street system and therefore also affect travel for all road users. This section provides general information on how different access management techniques affect pedestrians, cyclist, transit vehicles and passengers.

PEDESTRIANS AND CYCLISTS

Poor access management has the following implications for bicycle and pedestrian travel:

- Frequent driveways create multiple conflict points between vehicles entering and exiting a roadway and pedestrians and cyclists;
- Poorly defined and continuous curb cuts obscure sidewalks and create gaps in the pedestrian network;
- Poorly defined and continuous curb cuts complicate cycling by making it difficult to predict where vehicles may enter and exit the adjacent roadway; and
- Poorly designed, congested, and unsafe intersections do not efficiently or safely accommodate pedestrians and cyclists as they travel between arterial highways and the connecting local street systems.

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 crossing should be design to encourage lower speeds and to minimize conflicts. The following access management strategies promote pedestrian and bicycle travel[1].

- *Maximize driveway spacing*. Larger driveway spacing reduces conflicts and hazards. Reducing driveways also makes it easier to accommodate people with disabilities with a reduction in need for special treatments at driveway cuts.
- *Sidewalk location*. Locating sidewalks away from the curb offers many operational and safety benefits. If the green strip is of an adequate width, drivers can pull completely out of the traffic stream before yielding to a pedestrian on the sidewalk. Pedestrians are separated from street traffic and are 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

[1] Compiled from Iowa Access Management Handbook, TRB Access Management Manual, and Mass Highway 2006 Edition.

left turn lanes[2]. 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. As noted in the A/GFTC Bicycle and Pedestrian Plan, mid-block crossings are not as desirable as intersection crossings. However, when intersection spacing is large, mid-block crossings may be necessary to provide a more direct route between pedestrian origins and destinations.
- *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. The turn lane allows for slower turning speeds which help shorten roadway crossing distances for pedestrians due to a smaller radius (although the additional lane could also increase crossing distance).
- *Inter-parcel connections* for both pedestrians and motorists can limit short trips on the main route. These connections often take the form of simple curb cuts and short sidewalks between commercial sites, so that traffic and people moving from one to the other need not access the arterial.
- *Specialized and Interconnected Street System.* From a system-wide perspective, a well connected network of local, collector, and arterial roadways provides mobility for through traffic and access to land. The street system can also support a network of pedestrian and bicycle facilities. The street network provides alternative routes for local circulation away from the arterial for vehicles, cyclists, and pedestrians. If possible, the network should consist of blocks that range between 600-800 feet. These smaller blocks make the area more pedestrian and bicycle friendly and increase opportunities for side-street and rear access to parcels.

As noted in the *NYSDOT Policy and Standards of Entrances* to State Highways, all sidewalks, walkways, and stairways shall be constructed consistent with *NYSDOT Highway Design Manual* Chapter 18. Where sidewalks cross a driveway, several design issues need to be considered. The sidewalk surface should extend across the driveway to clearly establish the pedestrian right-of-way. Turning radii at the driveway should be as small as possible to encourage slow speeds as vehicles cross a sidewalk. As a sidewalk crosses a driveway, its cross-slope should not exceed 2% and sidewalk ramps should not exceed 8.3%. Driveways and driveway aprons that are constructed like ramps, with steep, short side flares, can render a section of sidewalk impassable, especially for people in wheel chairs. ***Figure 1*** on the following page shows how this issue can be addressed.

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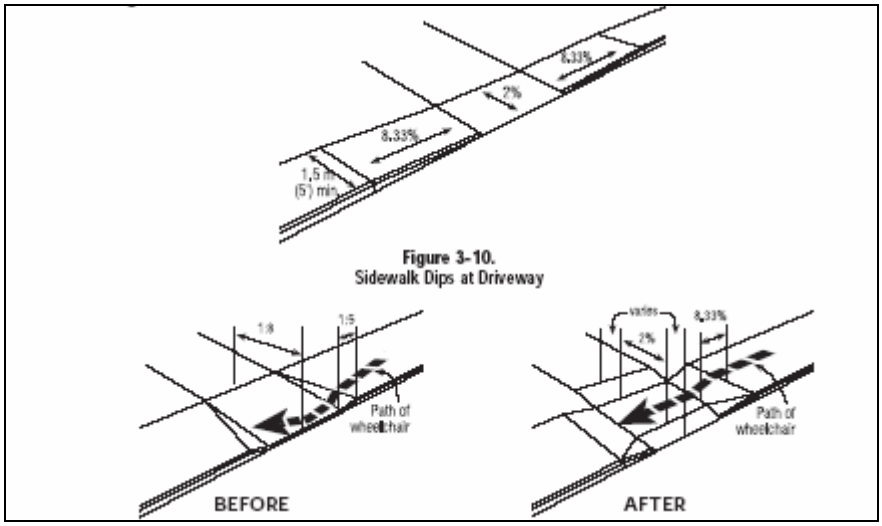
[2] A study conducted in Georgia found that non-traversable medians had 78% fewer pedestrian fatalities per 100 mile of road versus TWLTL. TRB Access Management Manual, Page 18.

Figure 1: Addressing Driveway and Sidewalk Slopes[3]



TRANSIT

Transit riders can benefit from good access management practices through reduced delay and travel time, a safer walking environment, and better access to transit stops as connectivity of streets, sidewalks, and other pedestrian ways are improved. A connected street system can also provide for improved transit routing.

The following functional requirements of transit vehicles and the basic safety and access needs of transit riders are important access issues:

- Adequate turning radii and throat width
- Adequate queue storage on-site and for left turn lanes
- Continuous pedestrian access along sidewalks and pathways
- Bicycle access or storage facilities
- Clean, well-lit comfortable places for transit riders to wait

Access to informal, curb-side bus stops should also be considered. As transit vehicles stop along a curb to pick up or drop off passengers, they interrupt the flow of traffic on the arterial. This issue could be addressed by providing bus pull-off lanes. Curb-side bus stops should also be located beyond the functional areas of intersections (the area where vehicles queue at traffic signals and change lanes as they approach or depart the intersection).

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[3] Page 3-18, "Vermont Pedestrian and Bicycle Facility Planning and Design Manual', National Center for Bicycling and Walking; December 2002