



1.0 Background

In order for the STH connection permit process to be effective, the use of general access management concepts has been established. The concepts have been proven to improve motorist safety and reduce crashes, ensure the preservation of the highway facility's capacity, and promote the reasonable and safe access to farmlands, residences, and businesses. They can be found in most state DOT and national access management publications. When reviewing STH connection permit applications, the concepts shall be adhered to as much as possible.

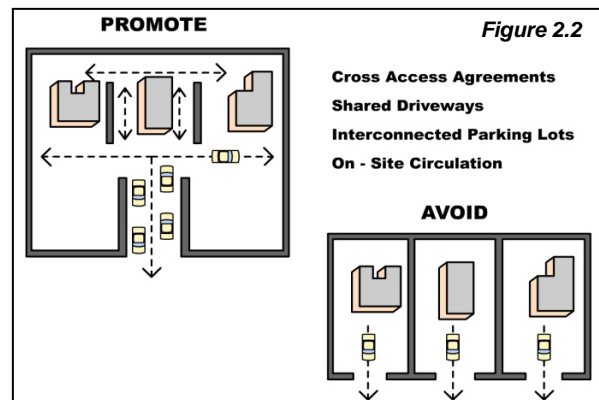
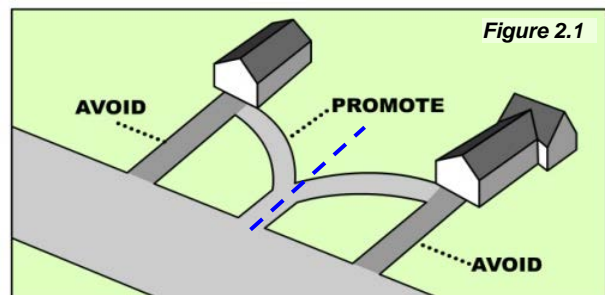
2.0 Access Management Concepts

When reviewing STH connection permit applications, WisDOT staff must consider a broad range of access management concepts. The main concepts have been detailed in the following sections.

2.1 Limiting the Number of Conflict Points / Consolidating Access.

Each connection is a possible conflict point. Traffic entering and leaving the highway should do so through a minimum number of connections in a manner and from a location that minimizes traffic congestion and does not adversely affect highway safety or operations. One way to limit the number of conflict points is eliminating horseshoe driveways. Also consider:

- a. Sharing a connection when conditions merit by placing it on a common property line (Figure 2.1)
- b. Having a non-abutting STH property owner obtain a permanent easement to use a connection of an abutting property owner
- c. Having an abutting STH property owner who cannot safely obtain direct access to the STH, obtain a permanent easement to an adjacent property that does have direct STH access. The use of a cross-access agreement is necessary, and WisDOT should not approve a permit application until evidence of that agreement has been submitted.
- d. Having adjacent properties construct cross-accesses between their properties to promote internal circulation rather than using the STH to get from one property to another (Figure 2.2).



2.2 Connection Purposefulness

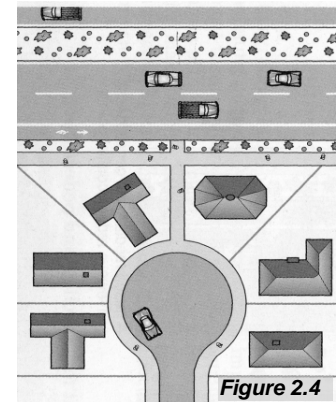
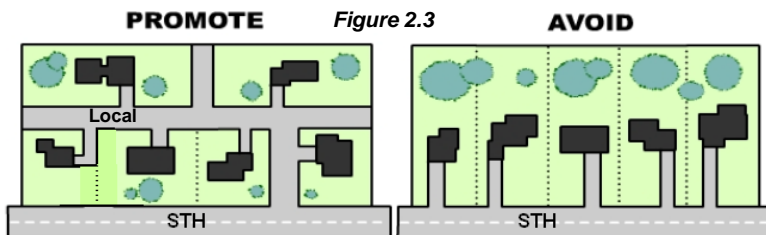
Each STH connection must serve a purpose. An additional connection request without a reasonable justification shall be denied based on [Trans 231.03\(2\)](#). Both the immediate reasons for and the long-term effects of any new connection must be considered with each permit application.

2.3 Use / Change of Use

Evaluate the relationship of use between a proposed connection and other existing connections on adjacent or surrounding lands now and in the future. For example, mixing commercial use with residential may not be appropriate for a corridor. However, the potential and/or desirability for changes of use to connections may be appropriate if a pattern of development is emerging throughout the corridor and is supported by local government(s), especially if the change follows an approved comprehensive or land-use plan.

2.4 Limiting Direct STH Access / Alternative Access

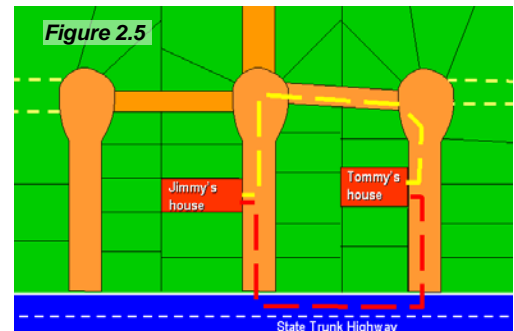
Limit direct STH access when alternative access is available (Figure 2.3). This is especially critical for SAMP Tiers 1, 2, and 3 (see 3.0). Access to a property should be off of the lowest functioning road, which may be a STH in some cases. WisDOT may deny access to a STH when a property abuts a lower functioning, non-STH road and reasonable access is available to that road.



In some situations, access to a STH may be appropriate for pedestrians and bicyclists, but not for motor vehicles, for example, establishing a connection from a cul-de-sac to an arterial with a public pathway (Figure 2.4).

2.5 Providing a Supporting Street and Circulation System

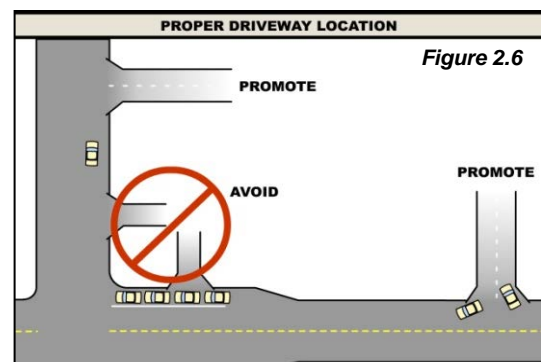
When reviewing public road connections, it is important to note if there is an internal street and circulation system that would minimize short trips onto a STH (Figure 2.5). A similar concept is shown in 2.1(d) where there are more advantages in having businesses provide cross-access between adjacent properties rather than having direct STH access for each business.



2.6 Required Connection Design

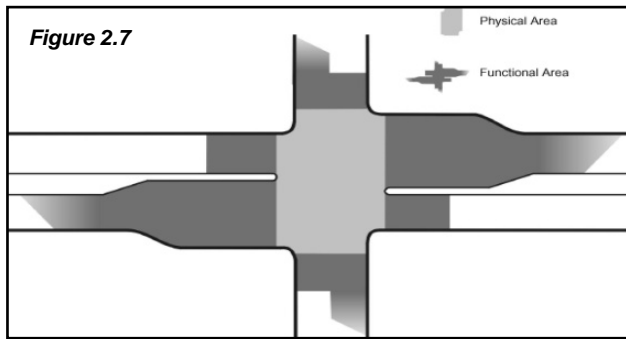
Connection designs should meet or exceed current geometric specifications, traffic projections, and operational requirements. In particular, each newly constructed connection should:

- Allow for safe sight distance from connection to roadway and vice-versa
- Be of maximum usefulness, and greatly reduce or eliminate (if possible) the need for other connections serving the same property
- Be part of a connection spacing pattern that will allow for easy and logical upgrading of the STH, if needed
- Be a sufficient distance away from other nearby connections
- Not be located within a vision corner
- Not adversely affect the future development of adjacent properties
- Maintain proper drainage
- Not be in the functional area of an intersection (Figures 2.6 and 2.7)

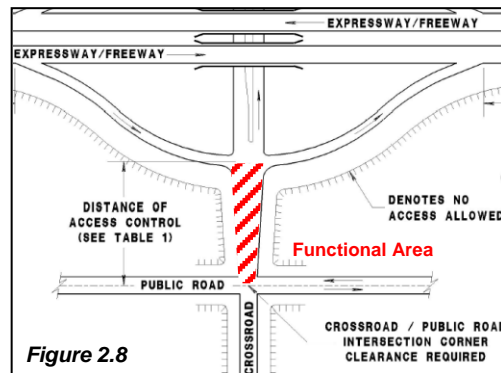


2.7 Preserving the Functional Area of Intersections and Interchanges

The most critical area of an intersection or interchange is its functional area (Figures 2.7 & 2.8). This is the area where motorists have to make numerous decisions regarding exiting, merging, weaving, turning, stopping, accelerating, etc. Connections too close to intersections [2.6\(h\)](#) or interchange ramps can cause serious traffic conflicts and greatly impair their function.

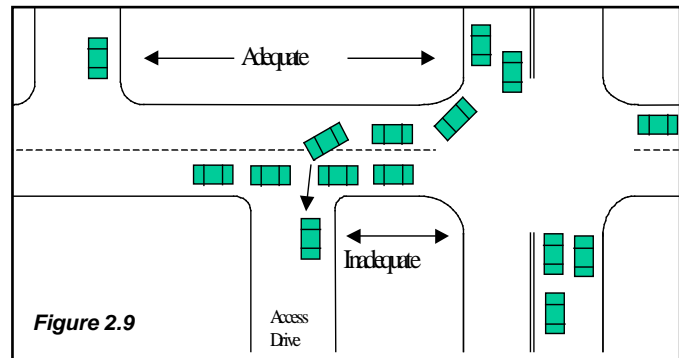


[FDM 11-5-5 \(Attachment 5.2\)](#) provides guidance on the appropriate distance a connection can be from the end of an interchange ramp terminal. Typically, WisDOT has purchased full access control in the functional area. In cases when this has not occurred or when sufficient access has not been purchased, permit applications that would create access conflicts in the functional area should not be approved.

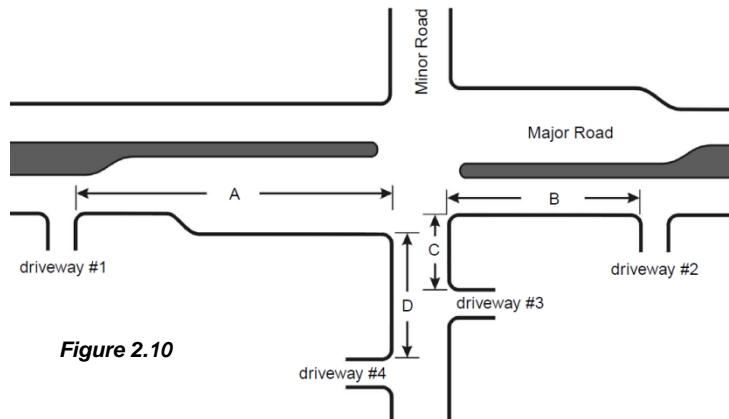


2.8 Separating Conflict Areas

When reviewing permit applications, connections must be sufficiently spaced from one another to ensure that the operability and safety of a STH is maintained (Figure 2.9). More separation distance gives motorists longer perception and reaction time thus reducing possible crashes. Higher traffic speeds require greater connection separation.



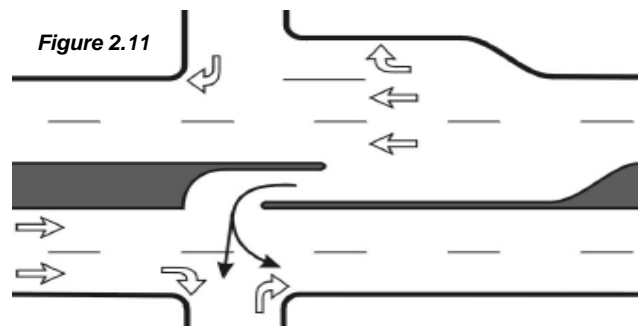
Minimum distances between intersections and driveways, also known as corner clearances (Figure 2.10), are detailed in [FDM 11-5-5](#) and [FDM 11-25-2](#) (pages 34-38). Corner clearances keep driveways out of the critical approach area (functional area) of an intersection. Inadequate corner clearances can result in traffic operation, safety, and capacity problems such as blocked driveways, conflicting/confusing turns at intersections, insufficient weaving distances, and backups from a downstream driveway into an intersection.



Locate driveways outside of the corner clearance distance. If possible, locate driveways on the side road instead of the STH. If it is necessary to locate a driveway within the corner clearance area, locate it as far as possible from the intersection, and if needed, combine with a raised median to limit the traffic volume that uses the driveway and to reduce conflicts.

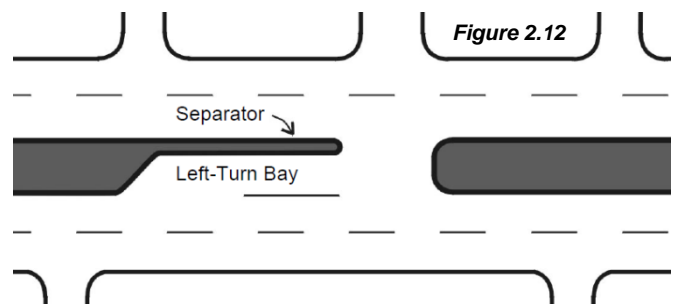
2.9 Using Non-Traversable (NT) Medians to Manage Left-Turn Movements

Medians can eliminate many conflict points by limiting or eliminating left turns. Directional median openings (Figure 2.11) safely provide controlled access with few conflict points. With a NT median, a connection becomes right-in/right-out only with just two conflict points. With a painted or traversable median, illegal turns can still occur. NT medians provide a good 2-stage crossing. When a mid-block crossing has a NT median, its visibility to motorists is increased. With this access management concept, pedestrians and bicyclists both travel along and across highways safely and comfortably.



2.10 Separating Turning Vehicles from Through-Traffic Lanes

Vehicles typically slow before turning. By removing turning vehicles from the main traffic flow (Figure 2.12), vehicle speed can be properly maintained at or near the posted limit. In addition to maintaining speed, road capacity preservation and crash potential reduction also occur. Carefully review permit applications that include modifying a STH with turn lanes to ensure that the lanes are warranted and sufficiently designed. In addition, permit applications without turn lanes also need to be carefully reviewed to see if a turn lane or a bypass lane is warranted – especially if there are high traffic counts on the proposed connection. Do not allow a median break for a driveway or alley within the limits of an exclusive left turn lane or its approach taper.



2.11 Locating Traffic Signals to Favor Through Movements

If a STH has poorly spaced and uncoordinated signals, its capacity, traffic speed and safety may be severely hampered by crossing movements (Figure 2.13). For example, a distance of ½-mile or more between signals is desirable, but that may be too far for effective coordination.

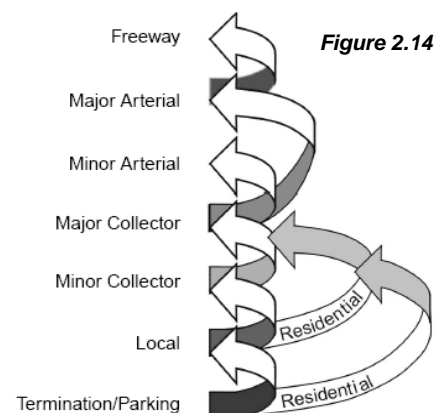
When receiving a STH connection permit application that involves a traffic signal, the application shall be sent to the traffic section for evaluation. If not already included with the application, a traffic impact analysis (TIA) may be requested from the applicant. Signals are not allowed for a private connection per the [Traffic Guidelines Manual 4-2-1](#).



2.12 Promote Intersection Hierarchy

A safe and efficient roadway system provides the appropriate transitions from one road classification to another (Figure 2.14). It is important to avoid joining a road of lower classification directly to one with a higher classification.

For example, local roads typically join with collectors rather than arterials, which typically do not have many residential connections. By preserving this hierarchy, traffic flow is maintained on higher road classifications and access conflicts are generally reduced and more manageable. Similarly, appropriate access is maintained on lower road classifications.



2.13 Including Pedestrian and Bicyclist in Access Management Decisions

Since WisDOT supports many travel modes, the potential impacts to bicyclists and pedestrians and not just motor vehicles must be assessed when reviewing connection permit applications. Median breaks within a roundabout, for example, provide a refuge for both pedestrians and bicyclists (Figure 2.15).

A trail crossing, whether used by pedestrians, bicyclists, ATVs, snowmobiles, etc., can be affected by access management decisions. For example, approving a new connection with a heavy turning movement may affect users of a nearby trail to get across the highway safely and damage the trail's overall effective use. If the new connection is necessary, then measures should be taken to protect the trail users. This could be done with partial trail relocation away from the new connection or even a grade separation with the trail going over the highway. Subsequently, any changes needed for the trail crossing are the responsibility of the new connection permittee and should be documented in the permit process.



Figure 2.15

3.0 State Access Management Plan (SAMP)

Under development.

4.0 Number of Driveways for a Property

There is no specific number of driveways that may be permitted for a property. [Trans 231.03\(2\)](#) does provide the following regulation, which WisDOT shall use with any new STH connection permit application:

“The number of driveways permitted serving a single property frontage along a state trunk highway shall be the minimum deemed necessary by the department for reasonable service to the property without undue impairment of safety, convenience, and utility of the highway.”

Many factors should be considered when determining the number of driveways including, but not limited to:

<ul style="list-style-type: none"> • SAMP¹ tier classification • Existing and proposed land use • STH crash history • Internal property circulation • Sight distance; vision corners 	<ul style="list-style-type: none"> • Consolidation of access • Cross access between properties • STH Average Annual Daily Traffic • Estimated trips/day for the driveway • Current access restrictions
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Use the following chart to aid in decision-making. The factors and situations described only serve as examples. A complete permit application review as detailed in [09-10-20](#) must be done to fully evaluate each situation.

DETERMINING THE NUMBER OF DRIVEWAYS FOR A PROPERTY	
#	Factor and Situation Examples
0	<ul style="list-style-type: none"> ▪ STH is a major arterial and there is a greater need for mobility rather than access ▪ Safety is a major concern due to crash history, high AADT, inadequate spacing, etc. ▪ Driveway would be in the functional area of an intersection ▪ Note: In above cases, alternative access should exist or be attainable on a local road ▪ Interstates, freeways, and SAMP Tier 1 and 2A ▪ Prevent use of STH to travel between adjacent properties and promote cross-access instead
1	<ul style="list-style-type: none"> ▪ Typical for most properties without access restrictions, and follows intent of Trans 231.03(2) ▪ Shared driveway with an adjacent property owner
2	<ul style="list-style-type: none"> ▪ A property with long STH frontage where connection spacing meets standards, and there is a clear and reasonable need for the driveways; for example, to separate specific uses such as a residential farm driveway and a field entrance, to get around physical barriers or to separate specific uses (pasture/crops) between two fields, or to aid internal property circulation when raised medians are needed and commercial entrances are limited to entrance only/exit only ▪ Two residential or commercial driveways (horseshoe configuration) should not be permitted unless there are safety concerns with internal property maneuvers; for example, semi-trucks or other large vehicles block the STH while turning and backing. A horseshoe driveway should only be considered as a last resort after evaluating whether the owner can make reasonable improvements to the property to provide safe STH ingress/egress. To protect WisDOT interests in these situations, a permit provision* should be added as noted below.
>2	<ul style="list-style-type: none"> ▪ A large property with very long STH frontage where connection spacing meets standards; for example, to maintain STH safety for a large shopping mall, a manufacturing plant, etc. ▪ Use of covenants on all driveways in this situation is highly recommended to help prevent unauthorized change of use, especially if the property is likely to be sold in the near future

*Under development

1 See Map 9-5 and Table 9-5 of the [State Access Management Plan](#), which is part of WisDOT’s Connections 2030 Long-Range Multimodal Transportation Plan