KYTC Highway Design

Chapter

ACCESS MANAGEMENT

Subject

Policies & Procedures

OVERVIEW:

Access management is the systematic control of the location, spacing, design, and operation of driveways, median openings, interchanges, and street connections to a roadway. Access management involves providing (or managing) access to land development while simultaneously preserving the flow of traffic on the surrounding road system in terms of safety, capacity, and speed. Access management includes several principles and techniques that are designed to increase the capacity of roads, manage congestion, and reduce crashes.

There are many decisions that affect access control that must be made by the project team. These decisions may include the type of access control and when it is to be provided. The project team should refer to the Transportation Research Board's *Access Management Manual* and AASHTO's *A Policy on Geometric Design of Highways and Streets*. The project team does not have the latitude to violate the access control policies documented in the Kentucky Revised Statutes (KRS) and Administrative Regulations (KAR).

This chapter addresses the policies and procedures that should be followed in determining access control.

ACCESS CONTROL:

KAR 5:120 details guidelines for developing and altering access control on the state-maintained highway system. The following pages draw from that KAR for guidance to aid the designer.

The following statute governs in Kentucky:

KRS 177.315 Spacing of access control points on limited access facilities for those having limited rights or easement of access.

(1) As used in this section, "partial control of access" means the limited right or easement of access granted by the Transportation Cabinet under subsection (2) of this section.

CONT.

ACCESS CONTROL (cont.):

(2) The Transportation Cabinet shall establish minimum spacing requirements for partial control of access to a limited access facility, and the manner that the access is to be provided, for the owners or occupants of land or other persons who have a limited right or easement of access under KRS 177.220. Minimum spacing between access points shall be one thousand two hundred (1,200) feet in rural areas and six hundred (600) feet in urban areas.

(3) The Transportation Cabinet may change the spacing of access control points if:

(a) 1. An owner or occupant of land abutting a limited access facility requests the Cabinet for the change; or

2. A local government requests the Cabinet for the change; and

(b) The change in spacing of access points is supported by an engineering and traffic study approved by the state highway engineer

(4) A change in spacing of access control points shall not exceed fifteen percent (15%) of the limit established in subsection (2) of this section.

When requesting change in spacing, the project manager should send a written request, justification, and corresponding plans through the district's Preconstruction Branch Manager to the Deputy State Highway Engineer for Project Development in order to obtain approval from the State Highway Engineer.

Definitions: In this regulation, where sections deal with requirements, use the words "shall," "should," and "may" to describe the degree of implementation of the requirements. To clarify the meanings intended, the following definitions apply:

Shall—A mandatory condition. Where describing certain requirements with the *shall* stipulation, it is mandatory.

Should—An advisory condition. Where the word *should* is used, consider it recommended but not mandatory.

May—A permissive condition. The requirement is optional.

Urban—Areas of residential, commercial, or industrial developments of sufficient concentration that they constitute or are characteristic of a city, which necessitates, for safety reasons, reduced highway speed limits to 45 mph or less, excluding interstate systems.

CONT.

ACCESS CONTROL (cont.): *Rural*—All areas other than urban.

Department's plans—The Department of Highways' current plans, which are based upon plans made at the time of contract letting together with any subsequent changes in access control made in accordance with applicable laws and regulations.

Access control—Access control shall be one of two types: by permit or limited. *By permit* refers to all highways designated as access-by-permit on the department's plans. *Limited access* refers to all highways designated as such on the department's plans and shall be of the following two types:

- A fully controlled access highway, which gives preference to through traffic and which shall have access only at selected public roads or streets and which shall have no highway grade crossings or intersections. The termini for control of access shall be as shown on the department's plans.

- A partially controlled access highway, which gives preference to through traffic. However, it may provide access to selected public roads and streets, and there may be some highway at-grade intersections and private driveway connections as shown on the department's plans. The termini for control of access shall be as shown on the department's plans. Designers are encouraged to place access breaks even when entrances are not to be constructed as part of the project.

Plan Access Notes: Place one of the following boxes with applicable notes inserted on the title sheet and right-of-way summary sheet of the plans for all state and federal-aid projects:

THIS PROJECT IS A FULLY CONTROLLED ACCESS HIGHWAY
THIS PROJECT IS A PARTIALLY CONTROLLED ACCESS HIGHWAY. ACCESS SHALL BE ALLOWED ONLY WHERE SPECIFICALLY SHOWN ON PLANS. MINIMUM SPACING IS ____ FEET.
THE CONTROL OF ACCESS ON THIS PROJECT SHALL BE BY PERMIT

CONT.

DEED OF CONVEYANCE: Every deed of conveyance for right of way acquired by the department on any state or federal project shall show, in addition to the Official Order number, the type of highway access. Types of access control are:

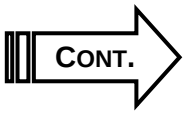
- Fully controlled access
- Partially controlled access
- Control of access by permit

Some parcels may have different types of access. The deed of conveyance shall clearly set forth the limits of the parcel, which come under different types of access control, as well as the type of control for the project.

STRIP MAP: A strip map shall be prepared showing all access points on partially controlled access facilities. Typically this is combined with the right-of-way strip map. The strip maps shall show all points of access by station (see **Exhibit 1300-07).** A copy of the strip map shall be included in the right-of-way plans.

CONTROL OF ACCESS ON CROSSROAD, INTERCHANGE VICINITY: For interstate and other freeway-type interchanges, full control of access shall extend along the intersecting crossroad a minimum of 100 feet (desirable 300 feet) in urban areas and 300 feet (desirable 600 feet) in rural areas. Project teams are encouraged to maximize the distance between the ramp terminal and entrances and signalized intersections. The point of measurement shall be from the intersection of the edge of normal roadway and ramp terminal. (See **Exhibits 1100-01** and **1100-02.)** The limits of access on the crossroad should terminate opposite each other, using the farthest point as control. Other access management techniques may be considered in unique circumstances. Please refer to the "Principles and Techniques" chapter, **HD-1102,** for example applications.

CORNER CLEARANCE: Corner clearance is the distance between an intersection and the nearest driveway. Inadequate corner clearances can result in traffic-operation, safety, and capacity problems. These problems can be caused by blocked driveway ingress and egress, insufficient weaving distances, and backups from a downstream driveway into an intersection. It is desirable to locate the access as far from the intersection as possible to reduce conflicts from overlapping movements.

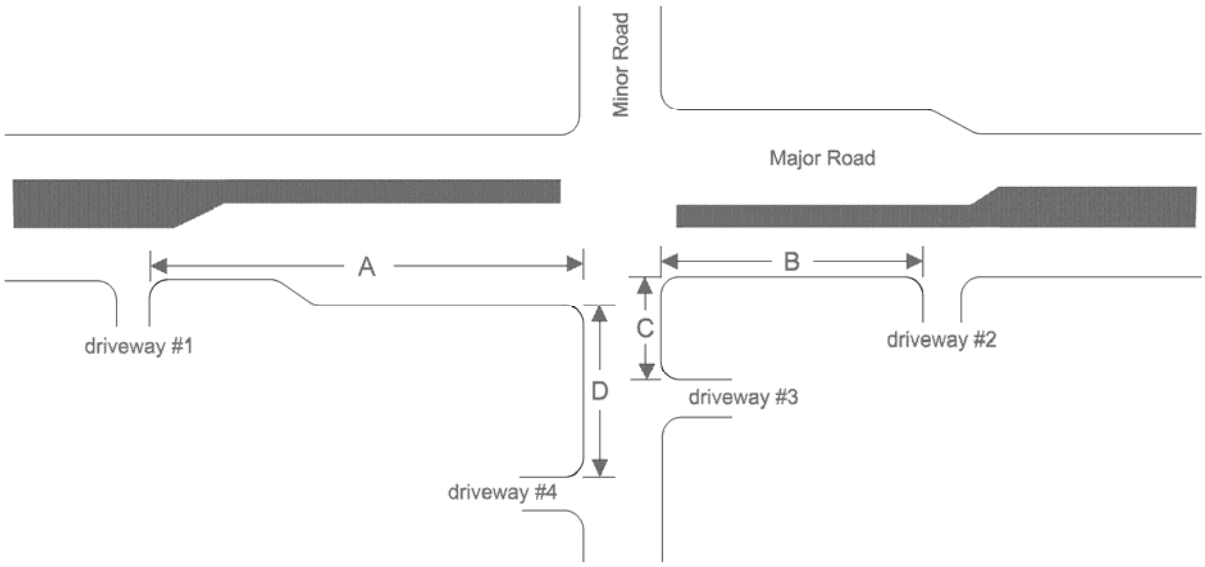


CORNER CLEARANCE (cont.):

There are four types of intersection corner clearance that should be evaluated during a design. (See the figure below.) Criteria used to derive the minimum corner clearance distances include:

- Perception reaction
- Queue storage
- Functional intersection area
- Stopping sight distance
- Maneuver distance
- Right-turn conflicts

It is important to evaluate the potential influences of any driveways/access points on the operation of an intersection. A detailed traffic engineering analysis of the intersection should be undertaken prior to any driveway design that may negatively impact intersection operation.

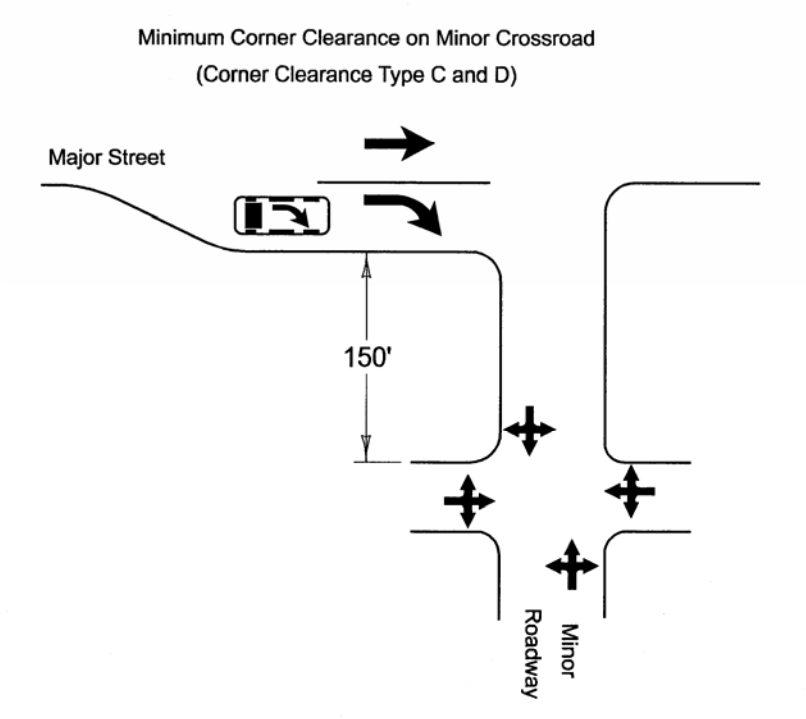


The four types of intersection corner clearances shown above are the following:

A. Upstream on the major roadway
B. Downstream on the major roadway
C. Approach side on the minor roadway
D. Departure side on the minor roadway

CONT.

CORNER CLEARANCE (cont.):



The minimum corner clearance on minor crossroads should not be less than 150 feet. In extreme cases, a right-in/right-out entrance may be considered on the minor roadway within 150 feet from the major street, provided a nontraversable median is constructed to prevent left turns.

For information and guidelines for deriving the access spacing for the four types of intersection corner clearances shown above, refer to the Transportation Research Board's *Access Management Manual*.

FENCING CONTROLLED ACCESS HIGHWAYS:

Fencing is to control indiscriminate entry or crossing of the roadways by vehicles, pedestrians, or livestock. Fencing also deters right-of-way encroachment. Areas that may be susceptible to encroachment by businesses, buildings, utility companies, farming, or entrances should be fenced.

CONT.

FENCING CONTROLLED ACCESS HIGHWAYS (cont.): The Design Executive Summary, TC 61-9 **(Exhibit 200-03),** will indicate the control of access required on a project. Fencing is generally required on fully controlled or partially controlled access highways. Only right-of-way monuments are used when access control is by permit. Although not always justified, it has become common practice to fence the entire length of fully controlled and partially controlled access highways. The use and location of fence should be reviewed on a project-by-project basis, particularly where access is restricted by terrain issues in mountainous areas, certain urban areas, or similarly restricted situations.

The Standard Drawings show typical drawings for chain link and woven wire fence. Normally, use woven wire fence for rural areas and chain link for highly developed urban areas. Other types of fence may be used where conditions warrant. The first consideration of the use of fence must be the control of access. However, aesthetics, right-of-way effects, and maintenance are all aspects that should also be considered. In some instances, the right-of-way agreement between the property owner and the department may place the responsibility for the construction and/or the maintenance of fencing with the property owner.

INDICATING CONTROL OF ACCESS FENCE ON PLANS: All plan sheets shall show the control of access fence, using the standard symbols shown on the first plan and profile sheet.

OFFSET FENCE: Right-of-way fence may deviate from the permanent right of way to prevent damage to the fence. Stream crossings (see **Exhibit 1100-03)** are an example of where this need is applicable.

KYTC Highway Design

Chapter

ACCESS MANAGEMENT

Subject

Principles & Techniques

OVERVIEW: Access management includes several principles and techniques that are designed to increase the capacity of roads, manage congestion, and reduce crashes. Since these are goals in the planning and design of new roads and the reconstruction of existing roads, designers should incorporate access management techniques into project designs. For more information, refer to the Transportation Research Board's *Access Management Manual*.

SPECIALIZED ROADWAY SYSTEM: Roadways are classified according to the functions they are expected to serve. It is important to design and manage roadways according to their function. Direct access to high-volume roadways should be limited. Four-lane divided highways should utilize fully or partially controlled access. Local and collector roads are more suitable for direct property access. Spacing between conflict areas should increase as speed increases.

TRAFFIC SIGNAL LOCATION: Traffic signals should offer priority to the through movements. Signalized access points should fit into an overall signal coordination plan. The project team should set a minimum spacing of traffic signals based on the goals of the project, such as improved traffic flow, signal coordination, increased safety, and the design speed/posted speed limit.

INTERCHANGE SPACING: Traffic conflicts may occur when interchanges are located in close proximity to other interchanges or other access points. A general guideline for minimum spacing of interchanges is one mile in urban areas and two miles in rural areas.

For interstates, minimum spacing should be one mile in urban areas and three miles in rural areas, based on crossroad-to-crossroad spacing. In urban areas, spacing of less than one mile may be developed by grade-separated ramps or by collector distributor roads. For design standards for interchanges on interstate routes, refer to AASHTO's *A Policy on Design Standards—Interstate System.*

CONT.

DRIVEWAY SPACING, LOCATION, & DESIGN:

Consideration should be given to the location of access points in relationship to intersection sight distance and appropriate spacing from other intersections. If access points are needed on opposite sides of the roadway, they should be located directly opposite each other. However, in highly urbanized roadways with numerous low-volume commercial or residential entrances, this may not be feasible.

It is essential that access connections be located and designed to ensure safe ingress and egress for the development and to minimize adverse impacts on the roadway. Driveways should not be located within the functional area of an intersection. Driveway width and throat length should accommodate the safe and efficient ingress and egress to the adjacent properties. The project team is encouraged to:

- Eliminate driveways that are not necessary for reasonable property access
- Combine driveways
- Provide cross access between properties
- Maximize the spacing between driveways

For divided roadways, each side can be considered independently in determining the distance between access points on the outside of the roadway. If access points are offset, then right-in/right-out entrances shall be utilized. Median openings allowing full access cannot be evaluated independent of direction. Crossovers are allowed only when spacing requirements can be met for both sides of the roadway. (See **Exhibit 1100-04.)**

TURNING LANES: Turning lanes allow vehicles to decelerate and wait in a protected area away from through traffic.

- **Left Turns—**Providing left-turn lanes at intersections reduces rear-end crashes and improves the roadway capacity.

- **Indirect Turns—**Providing indirect turns reduces conflicts in intersections because vehicles do not cross traffic. Jug handles require a right turn onto a feeder street followed by a left turn onto a cross street. Indirect U-turns require a U-turn past an intersection followed by a right turn instead of a left turn.

- **Right Turns—**Dedicated right-turn lanes segregate the traffic turning right from the through lanes and improve the roadway capacity. Access to roadways may be limited to right turns in and out to keep vehicles from crossing traffic and to improve capacity.

CONT.

TURNING LANES (cont.):

- **Flush Medians—**Flush medians, including two-way left-turn lanes (TWLTL), allow turn movements in multiple directions from a center lane.

- **Nontraversable Medians—**Raised barrier medians or depressed medians can prevent movements, such as left turns, across the roadway.

For more information, please refer to AASHTO's Green Book and the "Intersection" chapter, **HD-900,** of this manual.

SUPPORTING NETWORK OF ROADWAYS:

- **Alternate Access—**Where feasible, it is more appropriate to provide access from the secondary road than from the primary route. Providing reasonable access does not necessarily mean providing direct access to a state highway system.

- **Frontage Roadways—**Frontage roads segregate local traffic from the higher-speed through traffic and intercept driveways of residences and commercial businesses along a roadway.

  Frontage roads may cross a number of different properties in order to provide access. The area necessary to construct the frontage road should be acquired as right of way. Right of way is only acquired from one property owner to serve another. A frontage road that may be extended across a single-owner property could be done as an easement. There are also opportunities where a frontage road can be built and turned over to a developer as part of his or her right-of-way settlement.

  It is desirable to construct frontage roads 150 feet from the main road measured from mainline edge of pavement. This may not be obtainable in urban situations.

- **Backage Road/Reverse Frontage Road—**A backage road/reverse frontage road is an access road located to the rear of lots fronting on a major roadway.

- **Roundabouts—**Roundabouts are a common form of intersection control used throughout the world to improve safety and traffic flow conditions. For detailed discussions concerning roundabouts, please refer to AASHTO's *Policy on Geometric Design of Highways and Streets,* current edition, and various publications such as the Federal Highway Administration's *Roundabouts: An Informational Guide*.

KYTC Highway Design

Chapter

ACCESS MANAGEMENT

Subject

Access Additions & Alterations

ACCESS CONTROL BY PERMIT: On all highways where access control is by permit, the department shall establish criteria for modifying existing access and/or allowing additional access points. Proposals for modification to access should always consider the safety and interest of the highway users. The department may issue permits for additional access provided they are in conformance with the established department criteria. Please reference the *Permits Manual* for additional information.

FULLY CONTROLLED ACCESS: On all highways where access is fully controlled, additional access can be provided only by constructing new interchanges, with grade separations. An interchange justification study is required on interstate projects.

PARTIALLY CONTROLLED ACCESS: When any of the following conditions are met on partially controlled highways, the department may permit relocating or shifting existing access points, adding new access points, eliminating existing access points, or modifying the access control:

- May relocate or shift an access point by mutual consent of the property owner and the department. The access:
  - Shall remain on the same side of the highway
  - Cannot go beyond another existing entrance
  - Shall meet minimum spacing within the Cabinet's current design standards
  - Shall be an improvement based on standard engineering practices and safety criteria.

CONT.

PARTIALLY CONTROLLED ACCESS (cont.):

- May permit additional access points under the following circumstances after processing a permit request as described in Chapter 4 of the *Permits Manual.*

  - The original design and/or subsequent revisions represent overly restrictive control in light of current state design criteria for access points on partially controlled access highways; and

  - The centerline of the requested access shall not be closer than 1,200 feet to the centerline of the nearest existing point of access in rural areas; or

  - The centerline of the requested access shall not be closer than 600 feet to the centerline of the nearest existing point of access in urban areas; and

  - The property to be affected is not served by a frontage road or other public way; and

  - For divided roadways, each side can be considered independently in determining the distance between access points on the outside of the roadway. If access points are offset, then right-in/right-out entrances shall be utilized. Median openings allowing full access cannot be evaluated independent of direction. Median openings are allowed only when spacing requirements can be met for both sides of the roadway. (See **Exhibit 1100-04.)**

ALTERING ACCESS CONTROL:

When a previous decision specifying access control is no longer applicable, the department may change the access control designation to the extent justified, in accordance with procedures outlined in Chapter 4 of the *Permits Manual.*

PROCEDURES FOR ALTERING ACCESS CONTROL ON AN EXISTING HIGHWAY FACILITY:

Access Management techniques should be considered for every project. When access control is altered from existing conditions, the following procedures should be followed:

- **Modification of Plans and Deeds—**The department shall modify the plans and deeds when applicable.

CONT.

PROCEDURES FOR ALTERING ACCESS CONTROL ON AN EXISTING HIGHWAY FACILITY (cont.):

- **Modifications for Changed Access Control—**In situations where access control is becoming more restrictive, the department shall modify the plans and indicate the type of new access control. When access is being changed to less restrictive, the procedures outlined in the *Permits Manual,* Chapter 4, shall be followed.

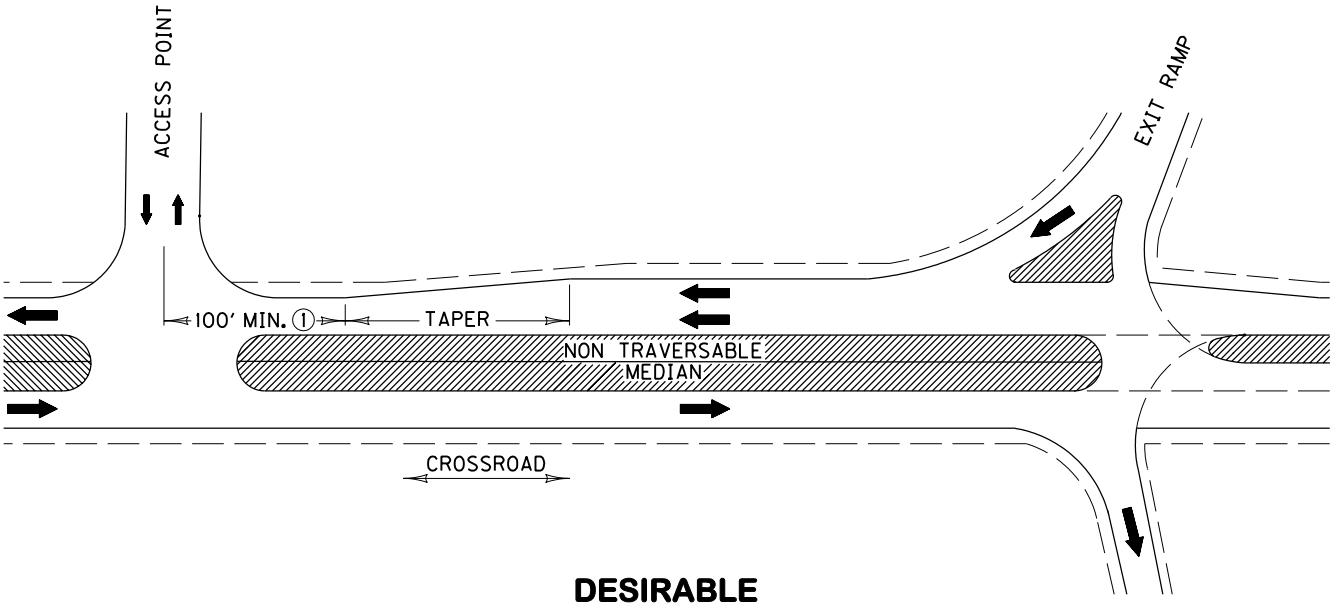
- **Restrictive Control Established—**In situations imposing control that is more restrictive, the department shall provide reasonable access or shall compensate the property owner(s) for loss of reasonable access.

- **Exceptions to Procedures for Access Control—**Exceptions to the procedures set forth in this section may be necessary in order to comply with all applicable federal and state laws and regulations.

- **Access Shown on Deed—**The deed of conveyance for right of way acquired by the department on any state or federal project shall, in addition to the Official Order number, show the designation of the type of highway access. If allowing new access, modify the deed of conveyance by filing a deed of correction at the expense of the property owner, if deemed necessary by the department.

- **Access Records—**The department shall maintain records for public inspection at its office in Frankfort, Kentucky, of all completed state and federal projects, together with the designation of the type of access allowed on the project.

CONTROL OF ACCESS ON CROSSROAD AND INTERCHANGE EXIT RAMP (URBAN)



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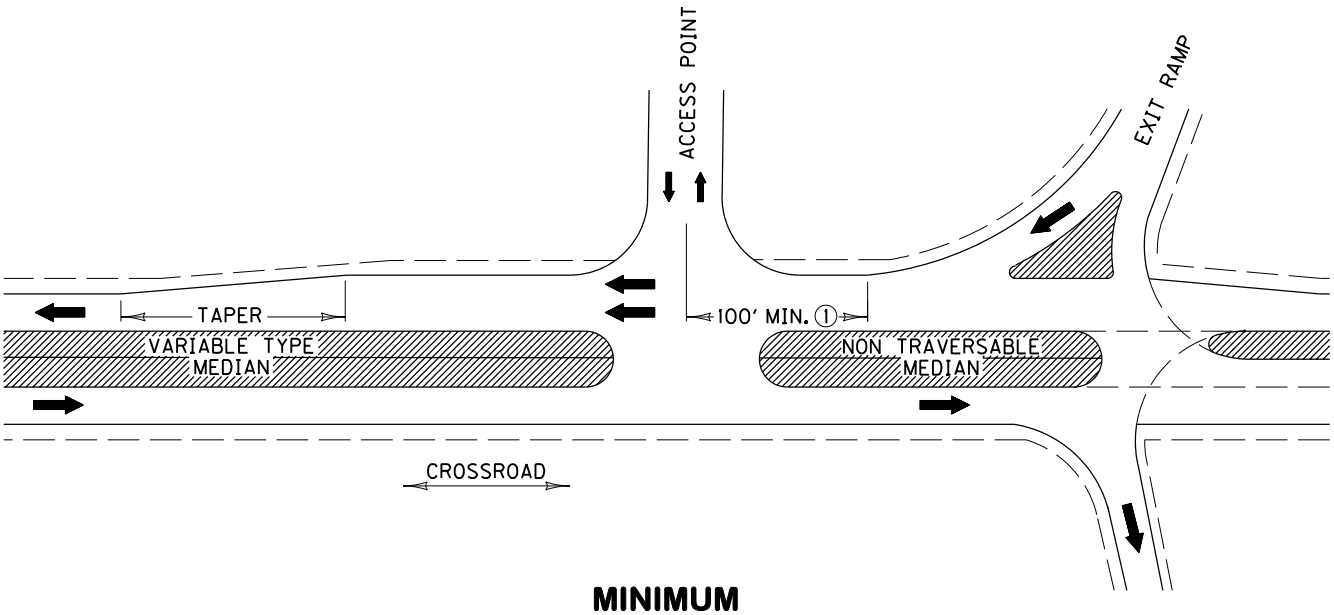
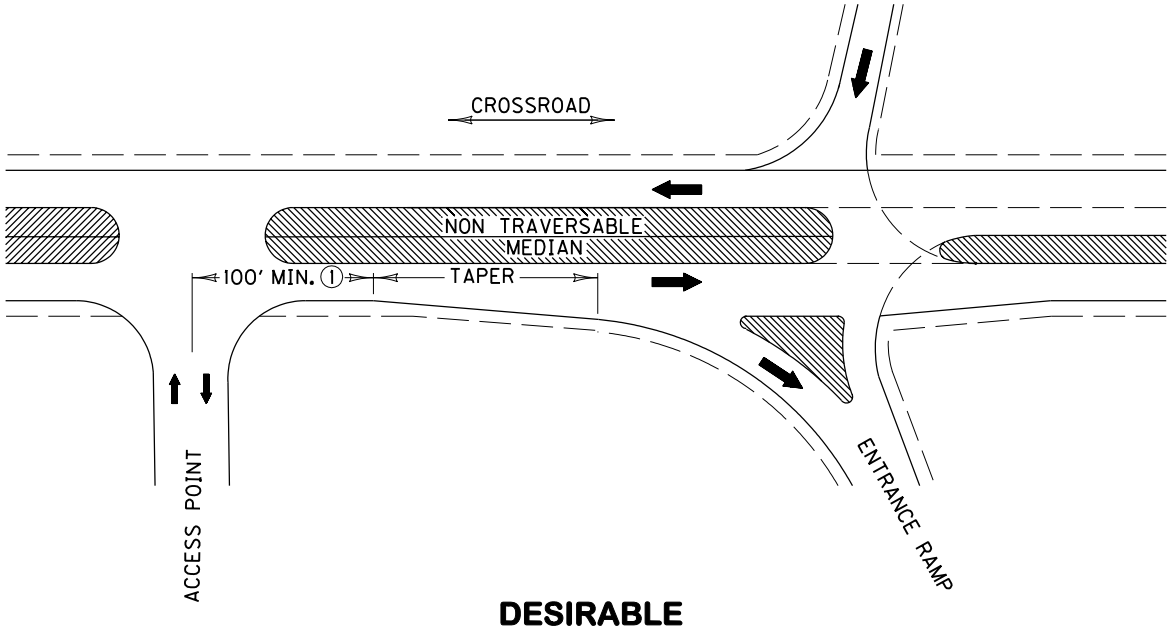


MINIMUM

① 300' IN RURAL AREAS.

DRAWING NOT TO SCALE

CONTROL OF ACCESS ON CROSSROAD AND INTERCHANGE ENTRANCE RAMP (URBAN)



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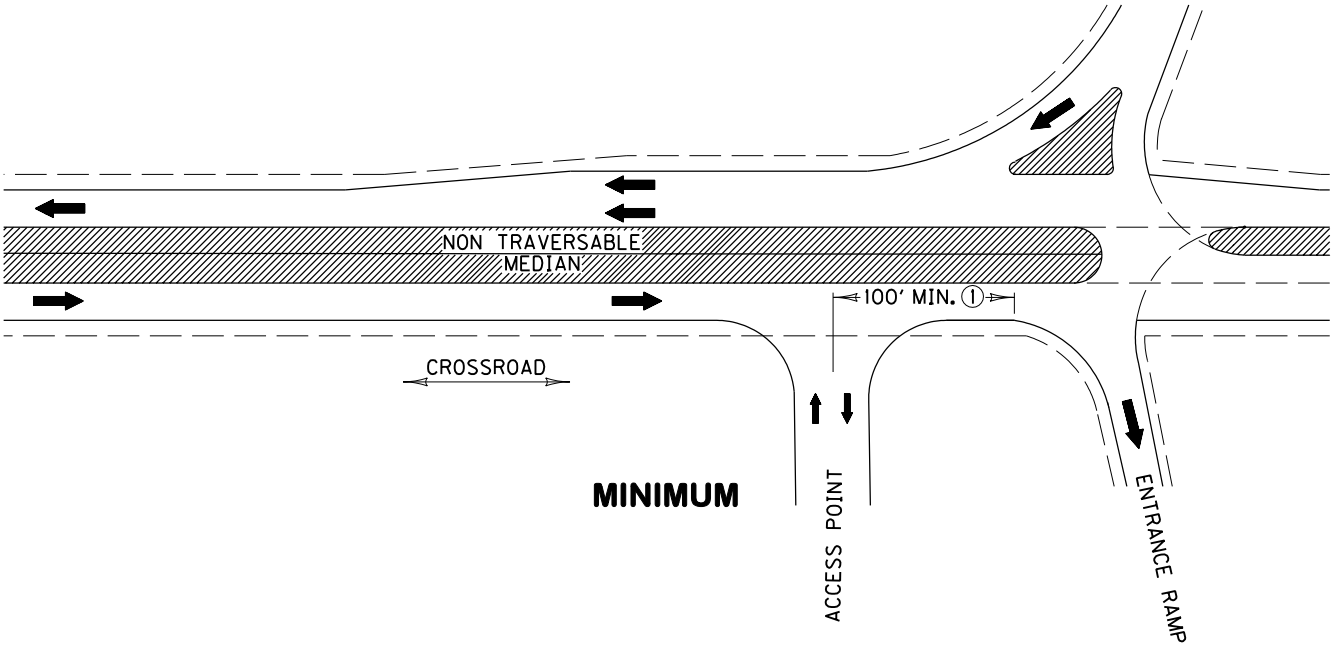


MINIMUM

① 300' IN RURAL AREAS.

DRAWING NOT TO SCALE

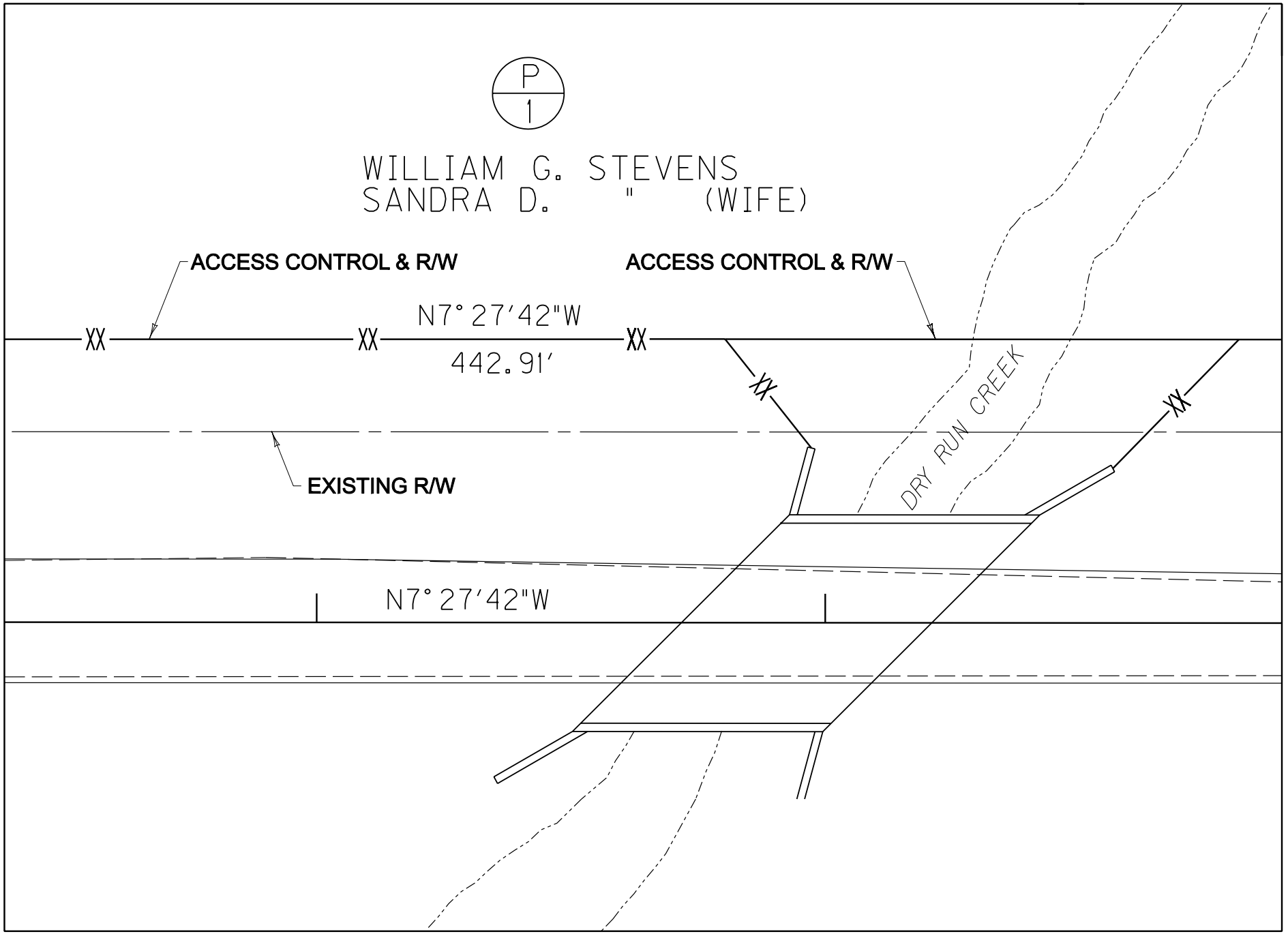
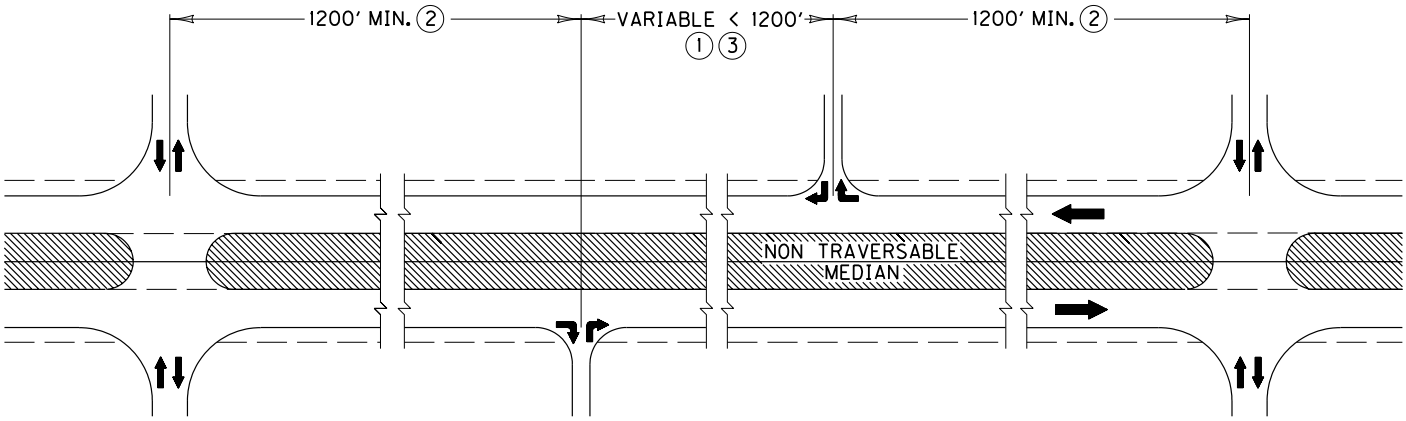


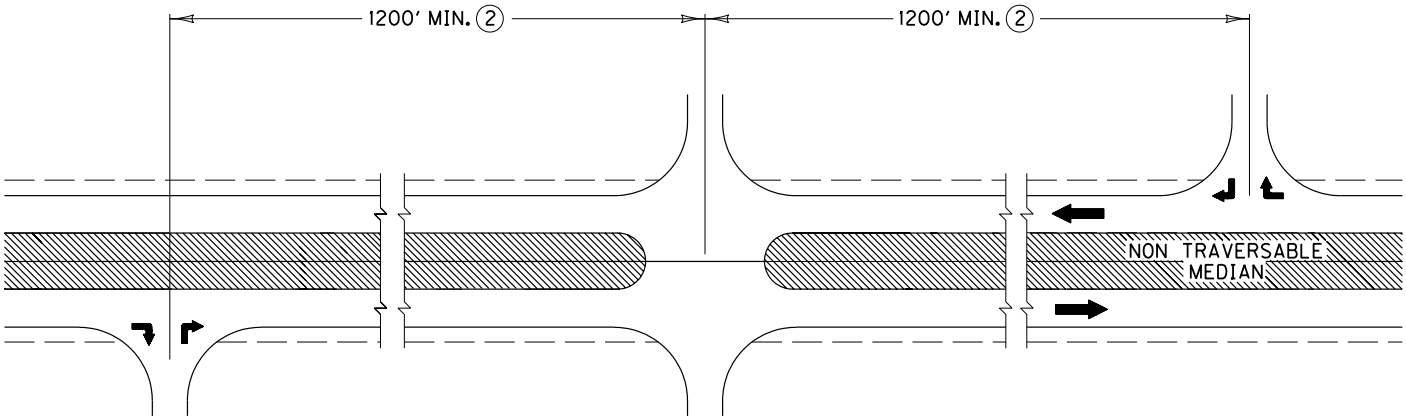
EXHIBIT NOT TO SCALE

04-05-2005

EXHIBIT 1100-03

COMMON PRACTICES FOR PARTIALLY CONTROLLED ACCESS (RURAL)





① IN THIS CASE, CROSSOVER NOT PERMITTED BECAUSE SPACING REQUIREMENTS NOT MET FOR BOTH SIDES OF ROADWAY.

② 600' MIN. FOR URBAN CONDITIONS (≤45 MPH)

③ VARIABLE < 600' FOR URBAN CONDITIONS

DRAWING NOT TO SCALE