TRAFFIC AND SAFETY NOTE 608A

SUBJECT: **Spacing for Commercial Drives and Streets**

PURPOSE: **To Promote a Uniform Practice in Determining Access Spacing**

COORDINATING UNIT: **Geometric Design Unit**

INFORMATION: The spacing of access for commercial driveways and streets is an important element in the planning, design, and operation of roadways. Access points are the main location of crashes and congestion. Their location and spacing directly affect the safety and functional integrity of the roadway.

<u>Region Review:</u> The Region/TSC Utility and Permit Engineer shall forward the site plan and the access request to the Region/TSC Traffic and Safety Representative for review. In general, one access point is adequate for a single business. When one-way pair driveways (In-Out) are requested and the inside traffic circulation promotes such operation, these driveways may be considered as a single access point. In some cases multiple access points are requested. In this case, the Region/TSC Traffic and Safety Representative may require a traffic impact study from the business owner/property owner to justify the need for the multiple accesses. A copy of the Traffic Impact Study Note (Traffic Safety Note 607A (7.8)) may be sent to the business owner/property owner to outline the traffic analysis needed.

<u>Unsignalized Access Spacing:</u> Adjacent accesses should be spaced as far apart as on-site circulation allows. In some cases the Region/TSC Traffic and Safety Representative may require that the business owner/property owner redesign his site plan, and relocate the access point to meet the desirable spacing distance. Table 1 shows the desirable unsignalized access spacing as a function of posted speed. These distances are based on average acceleration and deceleration considered adequate to maintain good traffic operations. The sight distance at the access points must also be investigated.

Posted Speed mph (km/hr)	Center-to-Center of Access feet (meters)
25 (40)	130 (40)
30 (50)	185 (55)
35 (60)	245 (75)
40 (60)	300 (90)
45 (70)	350 (105)
50 (80) and above	455 (140)

Table 1

Lack of Sufficient Frontage to Maintain Adjacent Spacing: In the event that a particular parcel lacks sufficient frontage to maintain adequate spacing, the Region/TSC Traffic and Safety and Utility and Permit Engineers have the following options.

a. Choose the next lowest spacing from Table 1. For example, on 30 mph (50 km/hr) roadway requiring 185 ft (56 m) spacing, the distance may be reduced to no less than 130 ft (40 m) which is the spacing fro 25 mph (40 km/hr) speed.

b. Encourage a shared driveway with the adjacent owners. In such case the driveway midpoint may be located at the property line between two parcels. However, all parties must agree to the joint driveway in writing.

c. Provide an access point to the side street when it is possible.

d. In areas where frontage roads or service drives exist or can be constructed, individual properties shall be provided access to these drives rather than directly to the main highway.

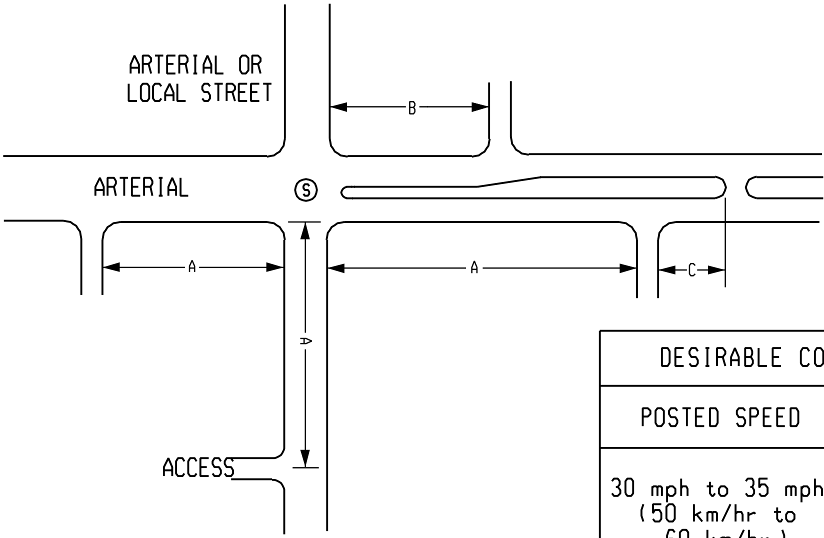
e. After all the above options are exhausted, an access point may be allowed within the property limits as determined by the Region/TSC Traffic and Safety and the Utility and Permit Engineers.

Intersection Corner Clearance: AASHTO specifically states that driveways should not be situated within the functional boundary of at-grade intersections. This boundary includes the longitudinal limits of auxiliary lanes. An access point may be allowed within the above boundary if the entire property frontage is located within this boundary. In all quadrants of an intersection access points should be located according to the dimensions shown on page 3.

Conflict Reductions: Restricting or prohibiting left turns at unsignalized access points aligned across from each other can greatly reduce safety and operational problems. A typical four-legged intersection, such as where two accesses line up across a four-lane roadway, has 36 conflict points. By prohibiting left turns and through movements the number of conflicts can be reduced from 36 to four, as illustrated on page 4.

In cases where these movements cannot be prohibited, as illustrated on page 4, the Region/TSC Traffic and Safety Representative may choose to offset the access points. Table 2 provides the desirable distances between two access points on the opposite side of the roadway.

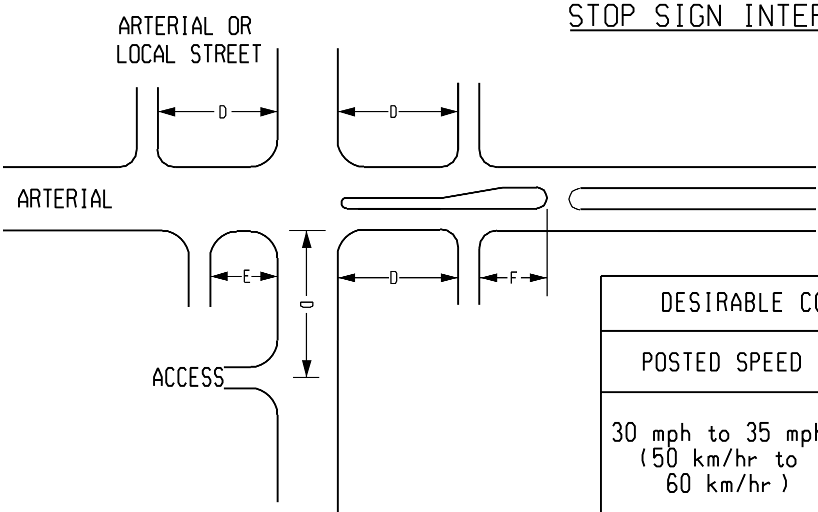
SIGNALIZED INTERSECTION CONTROL



- Coordinate with the Local Government Agency Regarding the Local Street Clearances.

DESIRABLE CORNER CLEARANCES		
POSTED SPEED	ITEM	ft (m)
30 mph to 35 mph (50 km/hr to 60 km/hr)	A	230 (70)
	B	115 (35)
	C	75 (22)
40 mph to 55 mph (60 km/hr to 90 km/hr)	A	460 (140)
	B	230 (70)
	C	150 (44)

STOP SIGN INTERSECTION CONTROL



- Coordinate with the Local Government Agency Regarding the Local Street Clearances.

DESIRABLE CORNER CLEARANCES		
POSTED SPEED	ITEM	ft (m)
30 mph to 35 mph (50 km/hr to 60 km/hr)	D	115 (35)
	E	85 (25)
	F	75 (22)
40 mph to 55 mph (60 km/hr to 90 km/hr)	D	230 (70)
	E	170 (50)
	F	150 (44)

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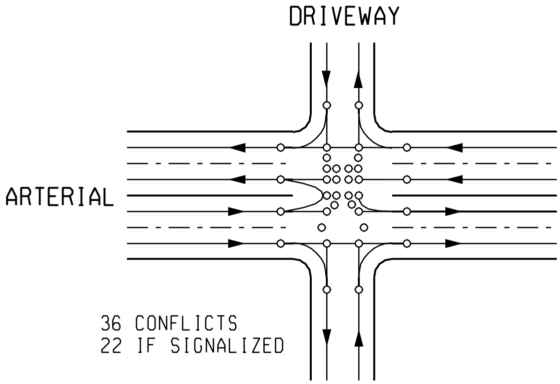
TRAFFIC AND SAFETY NOTE

SPACING FOR COMMERCIAL DRIVES AND STREETS

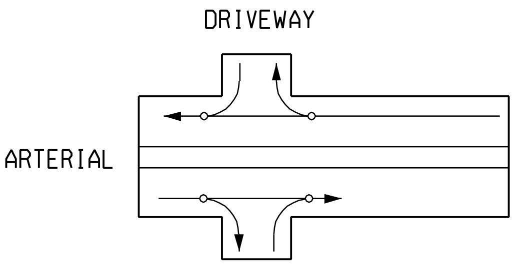
DRAWN BY: MTS CHECKED BY: JAT	08/05/2004 PLAN DATE:	608A	SHEET 3 OF 6
FILE: K:/DGN/ts notes/Note608A tsn.dgn		REV. 08/05/2004	

SAMPLE INTERSECTION CONFLICT POINTS



Two Driveways Line Up Across A Four Lane Arterial, Has 36 Conflict Points or 22 if Signalized.

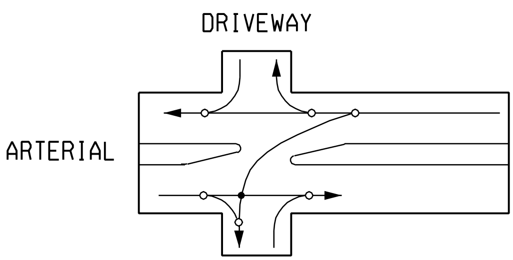
TYPICAL FOUR-LEGGED INTERSECTION



Restricting Left Turns and Through Movements can Reduce the Number of Conflicts to Four Which is Two Per Arterial Direction of Travel.

● 0 MAJOR
○ 4 MINOR
4 CONFLICTS

INTERSECTION WITH RIGHT TURN IN AND RIGHT TURN OUT



Notice the Distinction Between Major and Minor Conflicts. Merge and Rearend Conflicts Are Less Severe Than Crossing or Head-on Conflicts. Sometimes it is Appropriate to "Trade" Major Conflicts For Minor Conflicts

● 1 MAJOR
○ 6 MINOR
7 CONFLICTS

INTERSECTION WITH LEFT TURN IN, RIGHT TURN IN AND RIGHT TURN OUT

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Posted Speed mph (km/hr)	Desirable Offset Between Access Points on Opposite Sides of the Roadway Center-to-Center of Access On Undivided Highways
25 (40)	255 (80)
30 (50)	325 (100)
35 (60)	425 (130)
40 (60)	525 (160)
45 (70)	630 (190)
50 (80)	750 (230)

Table 2

Passing Flares at Driveways: To evaluate the need for passing flares at driveways on two-lane, two-way roadways, refer to Traffic and Safety Note 603A (7.3).

Right-turn Lanes or Tapers at Intersection: The addition of right-turn lanes or tapers should be considered to enhance the movement of traffic through intersections. To evaluate the need for right-turn lanes and tapers, refer to Traffic and Safety Note 604A (7.5).

Left-Turn Lanes or Passing Flares at Intersections: To evaluate the need for left-turn lanes or passing flares at intersections, refer to Traffic and Safety Note 605A (7.6).

Access Design: All access points shall be designed to meet the Michigan Department of Transportation guides, standards and Construction Permit Manual.

Signalized Intersection Spacing: Traffic signal spacing criteria should apply to all intersecting public streets and access drives. They should take precedence over unsignalized spacing standards where there is a potential for signalization. Ideally, locations of signalized intersections should be identified first. Various studies have shown that the number of traffic signals per mile has an even greater influence on travel speeds than the traffic volume per lane. Therefore, selecting a long and uniform signalized intersection spacing is the first essential element in establishing access spacing guides. The variables involved in the planning, design and operation of signalized roadways are reflected in the relationship between speeds, cycle length and signal spacing which yield maximum bi-directional progression band widths.

Thus, a signal timing plan must be able to provide efficient traffic flow with a speed compatible to the roadway posted speed. Table 3 represents the relationship between cycle length, speed and approximate distances between signals for bidirectional progression. The traffic representative may elect to relocate or consolidate drives in order to meet the spacing in Table 3. Spacing criteria can be reduced when only one direction of travel is signalized.

Peak Hour Cycle Length (sec)	Speed mph (km/hr)													
	25 *(40)*		30 *(50)*		35 *(60)*		40 *(60)*		45 *(70)*		50 *(80)*		55 *(90)*	
	Distance													
	feet	*m*	feet	*m*	feet	*m*	feet	*m*	feet	*m*	feet	*m*	feet	*m*
60	1,100	*335*	1,320	*400*	1,540	*470*	1,760	*540*	1,980	*600*	2,200	*670*	2,430	*740*
70	1,280	*390*	1,540	*470*	1,800	*550*	2,050	*625*	2,310	*700*	2,500	*760*	2,820	*860*
80	1,470	*450*	1,740	*540*	2,050	*625*	2,350	*720*	2,640	*800*	2,930	*890*	3,220	*980*
90	1,630	*500*	1,980	*600*	2,310	*700*	2,640	*800*	2,970	*900*	3,300	*1,000*	3,630	*1,100*
120	2,200	*670*	2,640	*800*	3,080	*940*	3,520	*1,070*	3,960	*1,210*	4,400	*1,340*	4,840	*1,475*

Table 3
Approximate Distances between Signalized Intersections Needed to Achieve Efficient Bidirectional Progression at Various Speeds and Cycle Lengths