

American Fork City Development Code

SECTION 3. Section 17.5.110 of the Development Code entitled Clear View of Intersecting Streets is hereby amended in its entirety, to read as follows:

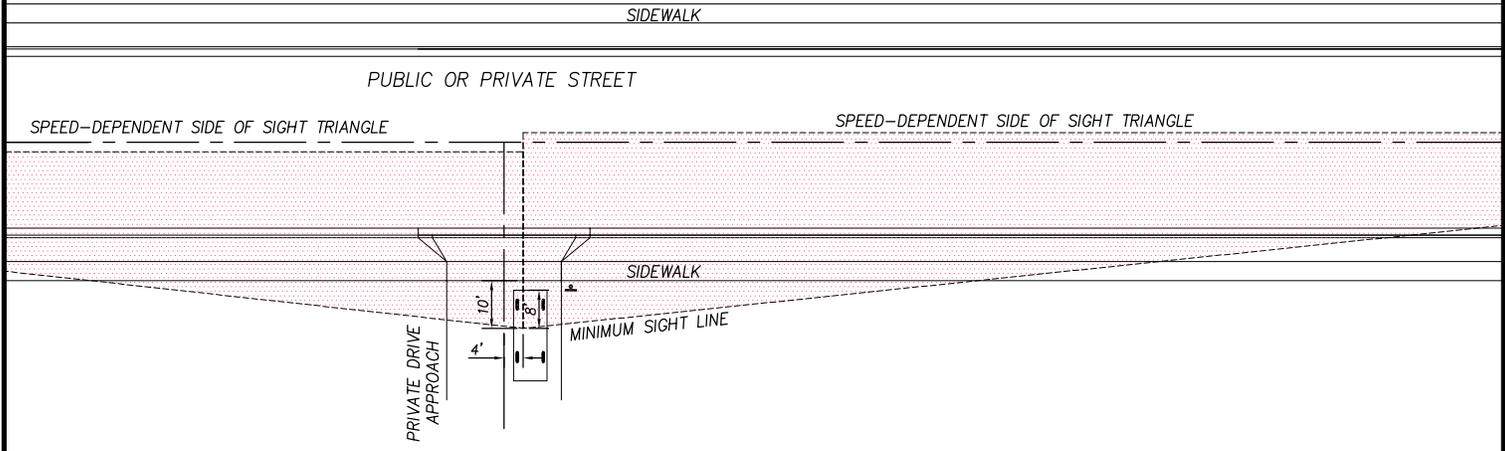
17.5.110 **Clear View of Intersection Sight Distances**

Intersection sight distances for public and private streets shall meet the following criteria.

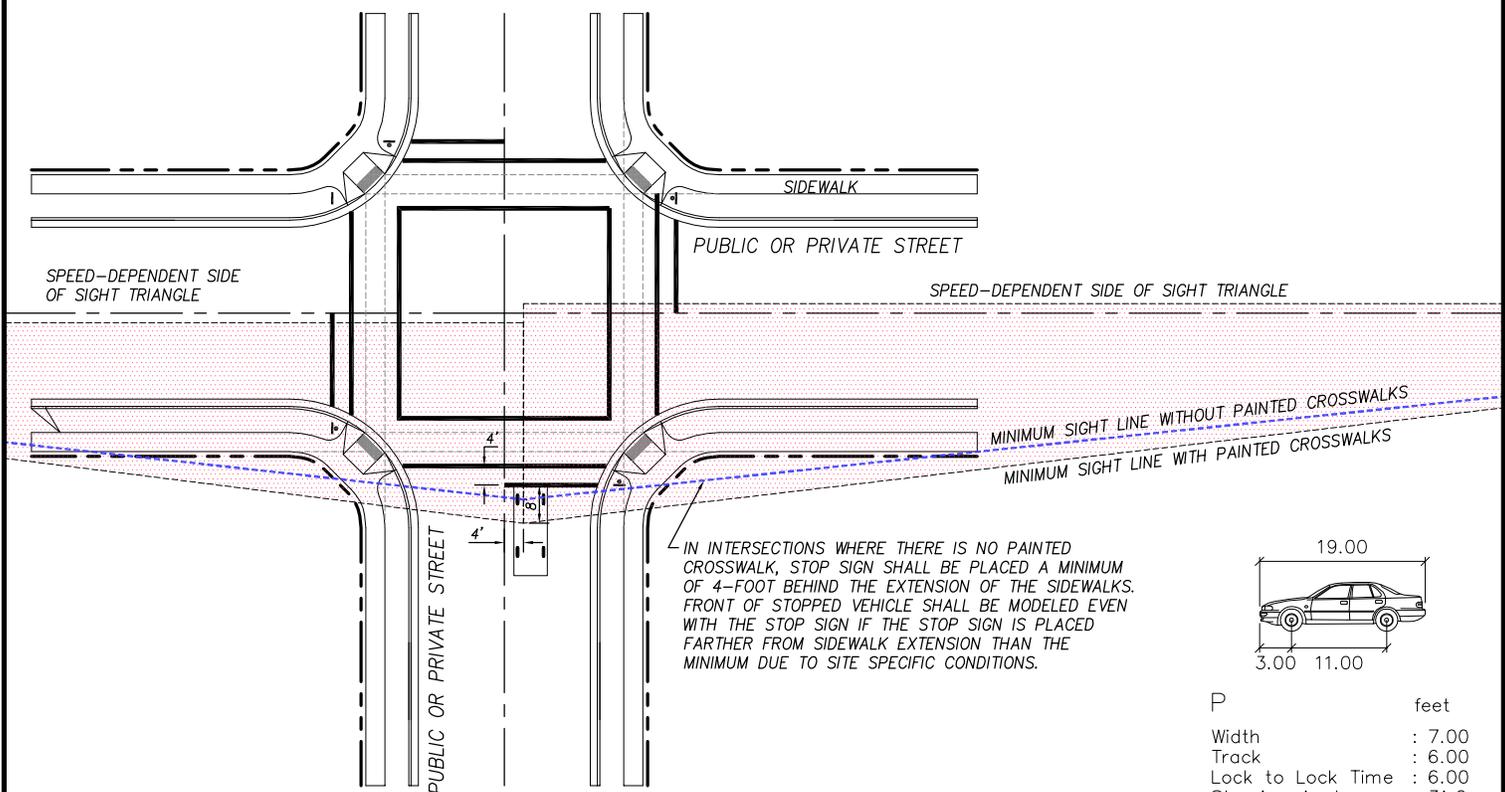
- A. Intersection sight distances shall comply with the terms of that certain document entitled A Policy on Geometric Design of Highways and Streets as promulgated by the American Association of State Highway Officials (AASHTO), which is hereby adopted for use within the City, as further defined on Figure 17.5.110-A.
- B. Sight obstructions are not permitted within the sight triangle, except that trees may be permitted provided that they are pruned to a height of not less than 8 feet. Also light poles and similar uses may be permitted, provided they do not create a visual impairment to traffic.
- C. “Approach Standards” shall be applied to streets without any stop control as set forth in AASHTO figure 9.50 (a).
- D. “Departure” standards shall be applied to intersecting streets with stop control devices, as set forth in AASHTO figure 9.50 (b). The distance identified as ‘a’ on said drawings is measured from a driver located 8 feet behind the stop sign/stop bar/cross walk.
- E. Stop Signs/Stop Bars shall be placed a minimum of 4 feet behind the painted cross walk or sidewalk extension (where no painted cross walk exists).
- F. Stop signs shall be placed a minimum of 2 feet behind the sidewalk at all locations, or drive approaches where the sidewalk extends through the travel way.

FIGURE 17.5.110-A

MINIMUM STANDARDS FOR INTERSECTION SIGHT DISTANCE

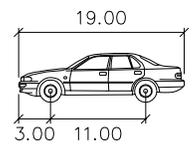


DRIVE APPROACH



ROADWAYS

IN INTERSECTIONS WHERE THERE IS NO PAINTED CROSSWALK, STOP SIGN SHALL BE PLACED A MINIMUM OF 4-FOOT BEHIND THE EXTENSION OF THE SIDEWALKS. FRONT OF STOPPED VEHICLE SHALL BE MODELED EVEN WITH THE STOP SIGN IF THE STOP SIGN IS PLACED FARTHER FROM SIDEWALK EXTENSION THAN THE MINIMUM DUE TO SITE SPECIFIC CONDITIONS.



P	feet
Width	: 7.00
Track	: 6.00
Lock to Lock Time	: 6.00
Steering Angle	: 31.6

AASHTO PASSENGER CAR DIMENSIONS

GENERAL SHEET NOTES:

1. WAITING VEHICLE SHALL STOP OUTSIDE OF PEDESTRIAN FACILITIES AS DETAILED HEREON OR GREATER AS DETERMINED BY SPECIFIC SITE LAYOUT.
2. SEE AMERICAN FORK CITY ACCESS MANAGEMENT MANUAL AND THE LATEST VERSION OF THE AASHTO MANUAL A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS FOR LENGTH OF SPEED-DEPENDENT SIDE OF SIGHT TRIANGLE.
3. SPEED-DEPENDENT SIDE OF SIGHT TRIANGLES SHALL BE CALCULATED BASED UPON DESIGN SPEED OF ROADWAY ALSO CONSIDERING EFFECTS OF ROADWAY GRADES FOR BOTH ROADWAYS.
4. NO OBSTRUCTION SHALL BE WITHIN THE SIGHT TRIANGLE IN THE AREA FROM 3-FOOT TO 8-FOOT (TRAFFIC SIGNS, NARROW STREET LIGHTS, NARROW TRUNK TREES WITH CANOPY ABOVE 8-FOOT EXCEPTED) OBSTRUCTIONS BELOW 3-FOOT ARE TO BE MINIMIZED.
5. DESIGNATED PARKING STALLS ARE NOT ALLOWED WITHIN SIGHT TRIANGLE AREAS.
6. DIMENSIONS SHOWN ARE MINIMUM. DESIGNER MAY OPT FOR MORE CONSERVATIVE SIGHT LINE DEFINITIONS
7. THIS DRAWING IS ALSO AVAILABLE AS STANDARD DRAWING #15.41

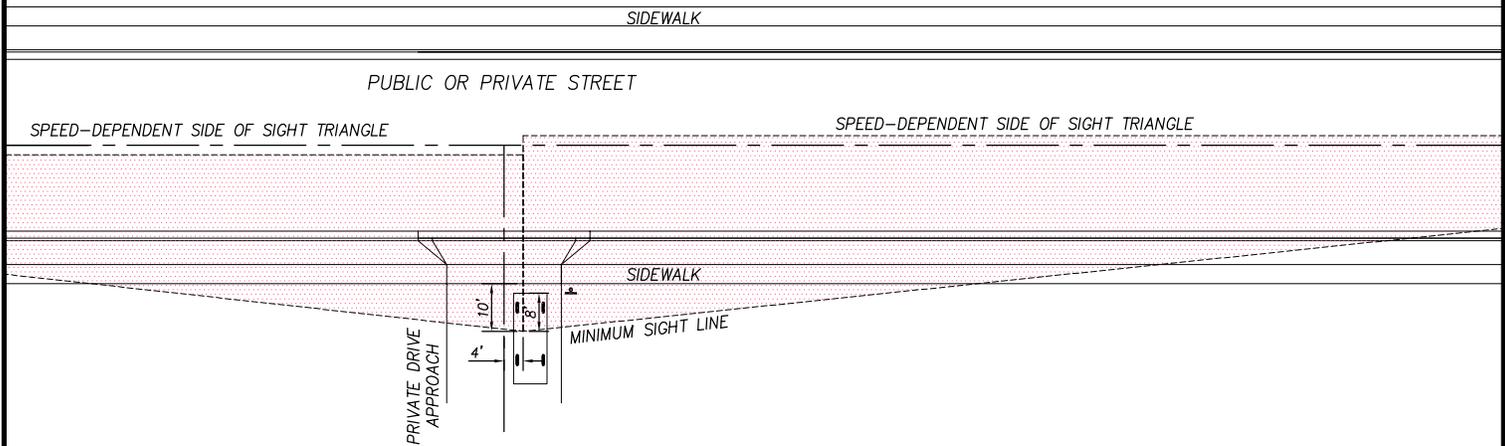
STD. DWG. #15.41



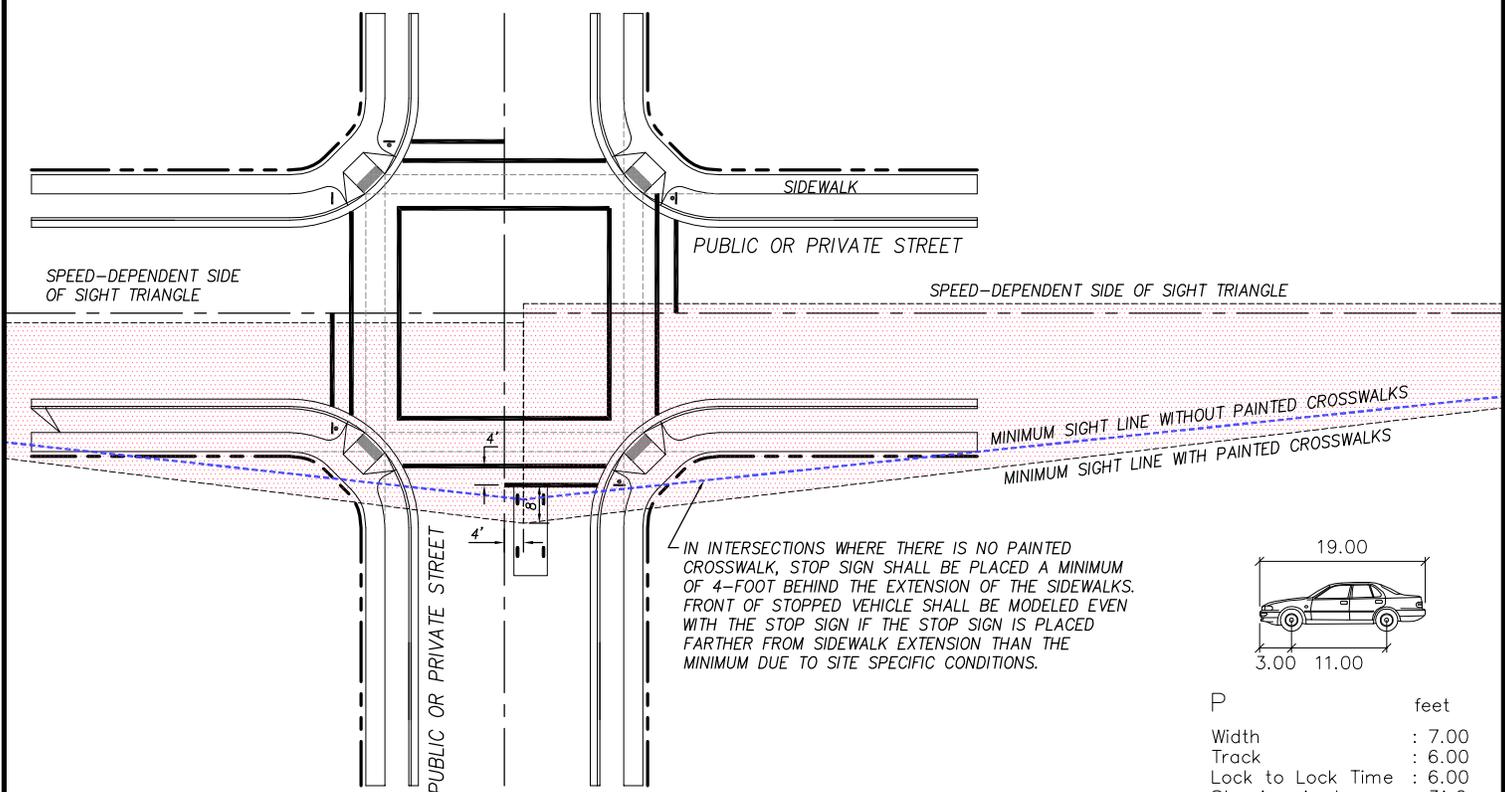
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DATE: FEBRUARY 28, 2012

FIGURE 17.5.110-A

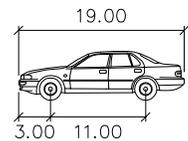
MINIMUM STANDARDS FOR INTERSECTION SIGHT DISTANCE



DRIVE APPROACH



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DATE: FEBRUARY 28, 2012

I. Intersection Sight Distance

This section discusses recommended intersection sight distance for several intersection types and is based on *AASHTO Greenbook* (2004) recommendations. These recommendations are made for various intersection control scenarios as well as functional classifications of the intersecting roads. Additionally, sight distances to accommodate trucks have also been calculated. Scenarios discussed in the following sections include intersection sight distance for a full access stop-controlled intersection, a RIRO access, a yield-control intersection (four-leg and three-leg intersection), and an uncontrolled intersection. Sight distance requirements for a left turn from a major street onto a minor street are also given within the provided tables for illustrative purposes. All intersection sight distances should be calculated by a licensed traffic engineer and compared to the tables within this manual.

For all of the scenarios, the following assumptions have been made:

- Design Speeds:
 - Access: 15 mph
 - Local: 30 mph
 - Minor Collector: 35 mph
 - Major Collector: 40 mph
 - Arterial: 50 mph
- Intersections are flat (all slopes are assumed 3 percent or less)
- Cross Sections:
 - Local: 2 lanes
 - Minor Collector: 2 lanes
 - Major Collector: 3 lanes
 - Arterial: 5 lanes
- All calculations are based on *AASHTO Greenbook* (2004) assumptions

Because the grade of the major or minor street does affect sight distance, the values presented in the sections below should be adjusted when grades are more than 3 percent. These adjustments should be made on an individual case-case basis by consulting the *AASHTO Greenbook*. Additionally, alternative design speeds or cross sections will also require adjustments to these sight distances.

Once intersection sight distances have been determined for a given intersection, a “clear sight triangle” can be formed which should remain clear of anything that will obstruct the driver from seeing other vehicles within the intersection sight distance. The *AASHTO Greenbook* states that the minimum height of a driver’s eye is approximately 3.5 feet. The maximum height (which corresponds to the driver of a combination or single unit truck) is approximately 7.6 feet. Therefore, objects should not be placed in the clear sight triangle between 3.5 and 7.6 feet in

height. Objects such as buildings, fences, and parked cars are examples of objects that will block the intersection sight distance. Landscaping features such as shrubbery and decorative rocks are acceptable as long as they are less than 3.5 feet high. Trees are acceptable as long as the stump is located outside of the clear sight triangle and the lowest branches are at least 7.6 feet tall. These height standards apply to areas with flat grade. Intersections near slopes must be evaluated on a case-by-case basis.

a. Stop-Controlled Intersections

Intersection site distances for stop-controlled intersections include full movement intersections where the minor street is stop-controlled, but the major street does not stop. RIRO intersection sight distance is also presented. Table 23 shows the sight distance required for full-movement intersections. Table 24 shows the sight distance required for RIRO intersections. In both cases, the sight triangle for the minor leg should be 20 feet back from the edge of traveled way of the major street. The value shown in the table is how far to the left and right for which the stopped vehicle should have a clear sight triangle. Figure 16 illustrates these distances and the sight triangle.

Table 23 Intersection Sight Distance – Two-Way Stop-Controlled				
Full-Movement Intersection (feet)				
Design Vehicle	Major Street			
	Local¹	Minor Collector²	Major Collector³	Arterial⁴
Passenger Car	335	390	470	625
Single Unit Truck	420	490	600	805
Combination Truck	510	595	720	950
Notes:				
1. Design Speed: 30 mph, 2-lane cross section.				
2. Design Speed: 35 mph, 2-lane cross section.				
3. Design Speed: 40 mph, 3-lane cross section.				
4. Design Speed: 50 mph, 5-lane cross section.				
Source: AASHTO Greenbook (2004) Case B1 (pp. 657-663)				

Table 24 Intersection Sight Distance – Stop-Controlled				
RIRO Access (feet)				
Design Vehicle	Major Street			
	Local ¹	Minor Collector ²	Major Collector ³	Arterial ⁴
Passenger Car	290	335	385	480
Single Unit Truck	375	440	500	625
Combination Truck	465	545	620	775

Notes:

1. Design Speed: 30 mph, 2-lane cross section.
2. Design Speed: 35 mph, 2-lane cross section.
3. Design Speed: 40 mph, 3-lane cross section.
4. Design Speed: 50 mph, 5-lane cross section.

Source: AASHTO Greenbook (2004) Case B2 (pp. 663-666)

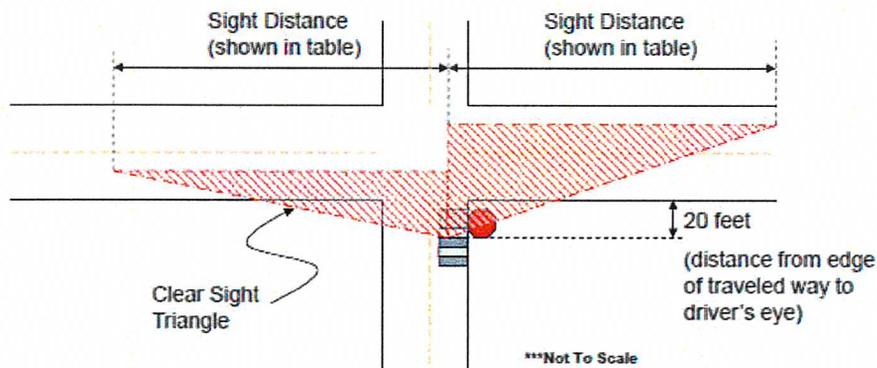


Figure 16 Intersection sight triangles for stop-controlled minor approaches (Source: Hales Engineering based on *AASHTO Greenbook (2004)* with modification by American Fork City for additional safety considerations).

b. Yield-Controlled Intersections

Intersection site distances for yield-controlled intersections include four-leg intersections where both minor street approaches are yield control as well as three-leg intersections where the

minor street is yield-controlled. In both scenarios, the major street does not stop. Other combinations of yield approaches must be evaluated on a case-by-case basis. Table 25 shows the sight distance required at four-way intersections with minor-street yield control. Table 26 shows the sight distance required at T-intersections with one yield-controlled leg. For the T-intersection scenario (Table 26), the site distance on the minor street is measured 82 feet back from the traveled way of the minor street approach. Figure 17 and Figure 18 illustrate these distances and the sight triangles for four-way and T-intersections, respectively. Sight distance values were only calculated for passenger cars as it is assumed that roads with significant truck traffic will not be yield-controlled intersections. Also, it was assumed that the major streets do not have classifications higher than minor collector, as these types of high classification streets should at least have stop control on the minor street.

Table 25 Intersection Sight Distance – Four-Way Intersection with Minor Street Yield Control (feet)			
	Minor Street	Major Street	
		Local ¹	Minor Collector ²
Minor Street Leg	Access ³	75	75
	Local ¹	160	160
Major Street Leg	Access ³	300	345
	Local ¹	290	335

Notes:

1. Design Speed: 30 mph, 2-lane cross section.
2. Design Speed: 35 mph, 2-lane cross section.
3. Design Speed: 15 mph, 2-lane cross section.

Source: AASHTO Greenbook (2004) Case C1 (pp. 666-670)

Table 26 Intersection Sight Distance – Three-Way Intersection with Minor Street Yield Control (feet)

	Minor Street	Major Street	
		Local ¹	Minor Collector ²
Minor Street Leg	Access ³	82	82
	Local ¹	82	82
Major Street Leg	Access ³	355	415
	Local ¹	355	415

Notes:
 1. Design Speed: 30 mph, 2-lane cross section.
 2. Design Speed: 35 mph, 2-lane cross section.
 3. Design Speed: 15 mph, 2-lane cross section.

Source: AASHTO Greenbook (2004) Case C2 (pp. 671-672)

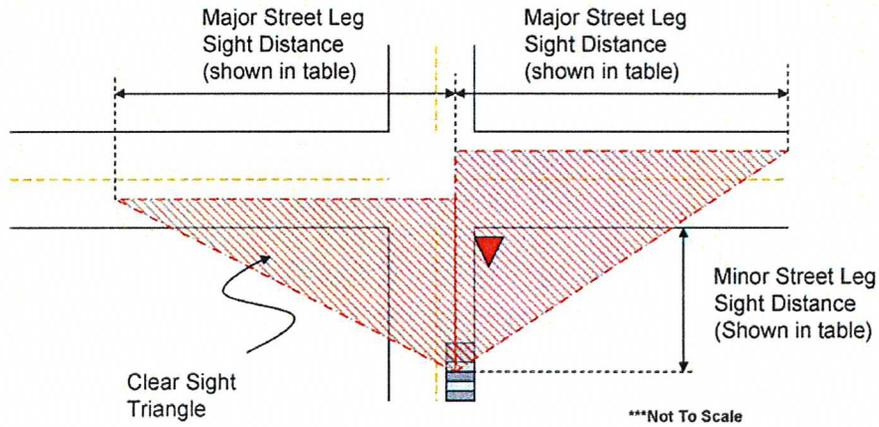


Figure 17 Intersection sight triangles for four-way intersections with yield control on the minor street approach (Source: Hales Engineering based on AASHTO Greenbook (2004)).

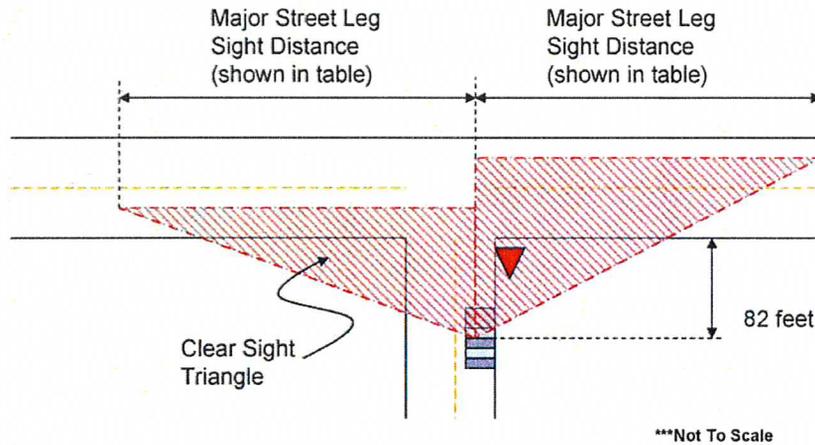


Figure 18 Intersection sight triangles for three-way intersections with yield control on the minor street approach (Source: Hales Engineering based on AASHTO Greenbook (2004)).

c. Uncontrolled Intersections

Uncontrolled intersection site distances are for those intersections where neither the minor nor the major street has any control. These streets are typically very low volume roads primarily in residential subdivisions. Table 27 shows the sight distance required at uncontrolled intersections. Only access roads and local streets were shown as any other higher classification road should have some intersection control. The distance shown in the table corresponds to the site leg of the site distance triangle for the respective type of road. Figure 19 illustrates the site distance triangle for this type of intersection. Sight distance values were only calculated for passenger cars as it is assumed that roads with significant truck traffic will not be yield-controlled intersections.

Table 27 Intersection Sight Distance – Uncontrolled Intersection (feet)		
	Access ¹	Local ²
Distance of Approach Leg	70	140
Notes:		
1. Design Speed: 15 mph, 2-lane cross section.		
2. Design Speed: 30 mph, 2-lane cross section.		
Source: AASHTO Greenbook (2004) Case A (pp. 654-657)		

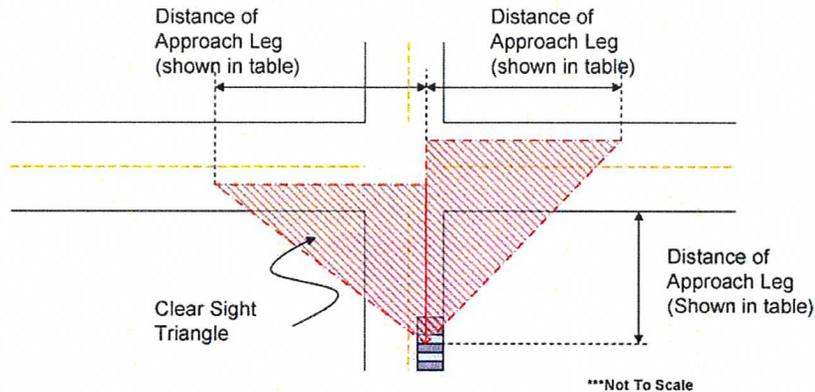


Figure 19 Intersection sight triangles for uncontrolled intersections (Source: Hales Engineering based on AASHTO Greenbook (2004)).

d. Left Turns from the Major Road

Intersection sight distance for left turns from the major road include any left turn movement where the driver must yield to oncoming traffic (through and right turning vehicles) before turning left onto the minor street. Table 28 shows the values for the sight distance triangles based as a function of design vehicle. Figure 20 illustrates the sight distance triangles for this type of movement.

Design Vehicle	Major Street			
	Local ¹	Minor Collector ²	Major Collector ³	Arterial ⁴
Passenger Car	245	285	325	445
Single Unit Truck	290	335	385	530
Combination Truck	335	390	445	605

Notes:

1. Design Speed: 30 mph, 2-lane cross section.
2. Design Speed: 35 mph, 2-lane cross section.
3. Design Speed: 40 mph, 3-lane cross section.
4. Design Speed: 50 mph, 5-lane cross section

Source: AASHTO Greenbook (2004) Case F (pp. 674-676)

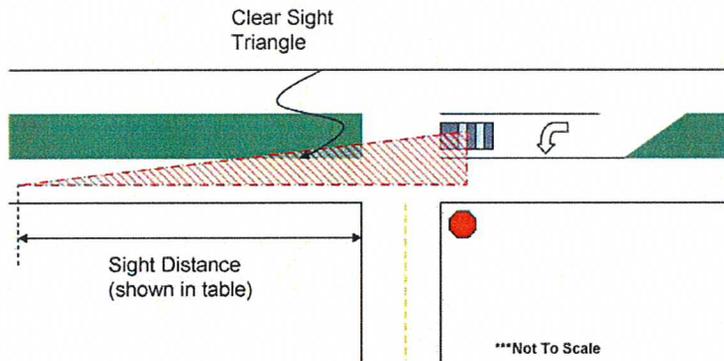


Figure 20 Intersection sight triangle for a left turn from the major street onto the minor street (Source: Hales Engineering based on *AASHTO Greenbook* (2004)).