2.5 Intersection Design

B. Geometric Design

9. Intersection Sight Distance

The maneuvers occurring at an intersection are different from those occurring at other points along a highway and sight distance needed to ensure safety at AN intersection is consequently different.

Areas along the intersection approach should be cleared of obstructions which could interfere with the driver's view. These areas are called clear sight triangles. In intersection design, two types of clear sight triangles are used: approach sight triangle and departure sight triangle.

The approach sight triangle pertains to vehicles approaching an uncontrolled or yield-controlled intersection. The triangular area at each quadrant should be clear of obstructions so that drivers approaching the intersection can see a potential conflicting vehicle and have adequate time to slow down or stop.

The departure sight triangle provides sight distance for stopped vehicles on the minor-road to depart the intersection and enter or cross the major road. Departure sight triangles should be provided in each quadrant of each intersection approach controlled by yield or stop sign.

The sight triangles vary with the different type of traffic control. AASHTO, A Policy on Geometric Design of Highways and Streets have categorized intersections with the following different type of traffic control.

Case A - Intersection with no control
Case B - Intersection with stop control on minor street
- Case B 1 - Left Turn from minor street
- Case B3 - Right turn from minor street
- Case B3 - Crossing maneuver from the minor street

Case C - Intersections with yield control on minor street
- Case C 1 - Crossing maneuver from the minor road
- Case C2 - Left or right turn from the minor road

Case D – Intersections with traffic signal control
Case E - Intersections with all-way stop control
Case F - Left turns from the major street

Procedures to determine sight distances at the various types of intersections can be found in AASHTO, "A Policy on Geometric Design of Highways and Streets. 2004" or latest edition. Operating speed *(*85^{th} percentile) along the existing road shall be utilized for the analysis. INTERSECTION SIGHT DISTANCE IS MEASURED USING A HEIGHT OF EYE OF 3.5 FEET AND HEIGHT OF OBJECT OF 4.5 FEET. THE DISTANCE IS MEASURED FROM A POINT 10 FEET BACK FROM THE EDGE OF PAVING.

[[For residential area, stopping sight distance may be used up to a point where the road being entered or crossed is a minor collector or below. Sight distance is measured from an eye height of 3.5 feet at a point on the centerline of the access 10 feet back from the edge of travel way of the intersecting roadway where a point 2 feet above the roadway surface is visible. For all other intersections, intersection sight distance must be met.]]

INTERSECTION SIGHT DISTANCE REQUIREMENTS MUST BE MET AT ALL INTERSECTIONS. HOWEVER, FOR RESIDENTIAL ACCESS ROADS (SIDE ROAD) WHERE THE ROAD BEING ENTERED OR CROSSED IS CLASSIFIED AS A MINOR COLLECTOR OR BELOW (MAIN ROAD), STOPPING SIGHT DISTANCE MAY BE USED.

STOPPING SIGHT DISTANCE SHALL BE MEASURED ALONG THE MAIN ROAD CENTERLINE AND MEET THE REQUIREMENTS OF SECTION 2.2.D.1. THE APPROACHING DRIVER'S EYE HEIGHT SHALL BE A POINT 3.5 FEET ABOVE THE ROAD PAVEMENT ON THE MAIN ROAD, AND SHALL ALLOW FOR THE CONTINUOUS UNOBSTRUCTED VIEW OF AN OBJECT 2.0 FEET ABOVE THE ROAD PAVEMENT AT THE INTERSECTION OF THE SIDE AND MAIN ROADS.

ADDITIONALLY, A VEHICLE WAITING ON THE ACCESS ROAD SHALL HAVE A CONTINUOUS UNOBSTRUCTED VIEW OF THE APPROACHING VEHICLE ON THE MAIN ROAD POSITIONED AT THE REQUIRED STOPPING SIGHT DISTANCE. FOR THIS SECOND CONDITION, THE DRIVER'S EYE HEIGHT SHALL BE A POINT 3.5 FEET ABOVE THE ROAD PAVEMENT, PLACED ON THE CENTERLINE OF THE SIDE ROAD AT A POINT 10 FEET BACK FROM THE MAIN ROAD EDGE OF PAVEMENT. THE OBJECT SHALL BE A POINT 2.0 FEET ABOVE THE ROAD PAVEMENT PLACED ON THE CENTERLINE OF THE MAIN ROAD POSITIONED AT THE REQUIRED STOPPING SIGHT DISTANCE. BOTH MAIN AND SIDE ROAD CONDITIONS MUST BE MET IN ORDER TO USE STOPPING SIGHT DISTANCE.

[[Where a roadway can not meet intersection sight distance, a request to waive intersection sight distance may be submitted. The request shall include stopping sight distance computations showing the proposed intersection located at the optimum location to achieve maximum sight distance and meet the requirement of Section 2.3. The request shall also include a measurement at which point the driver stopped at the intersection and the approaching driver can see each other.]]

WHERE A RESIDENTIAL ACCESS ROAD ENTERS A ROAD CLASSIFIED AS A MAJOR COLLECTOR OR HIGHER AND CANNOT MEET INTERSECTION SIGHT DISTANCE OR WHERE A NON-RESIDENTIAL ACCESS ROAD CANNOT MEET INTERSECTION SIGHT DISTANCE ENTERING ANY ROAD, A REQUEST TO WAIVE INTERSECTION SIGHT DISTANCE MAY BE SUBMITTED; HOWEVER, AVAILABLE SIGHT DISTANCES LESS THAN THE REQUIRED STOPPING SIGHT DISTANCE WILL NOT BE ACCEPTED. THE REQUEST SHALL INCLUDE THE FOLLOWING:

A. A SIGHT DISTANCE EXHIBIT DRAWN TO SCALE SHOWING THE PROPOSED INTERSECTION IN PLAN AND PROFILE VIEWS MEETING THE REQUIREMENTS OF SECTION 2.3;

B. THE PROPOSED OPTIMUM INTERSECTION LOCATION TO ACHIEVE MAXIMUM SIGHT DISTANCE;

C. DEPICTION OF THE REQUIRED INTERSECTION SIGHT DISTANCE;

D. DEPICTION OF THE EXISTING INTERSECTION SIGHT DISTANCE;

E. DEPICTION OF THE REQUIRED STOPPING SIGHT DISTANCE;

F. DEPICTION OF THE CONTINUOUS UNOBSTRUCTED VIEW FROM THE SIDE ROAD TO THE APPROACHING VEHICLE ON THE MAIN ROAD;

G. STOPPING SIGHT DISTANCE CALCULATIONS;

H. DATA VERIFYING 85^{TH} PERCENTILE SPEED; AND

I. ANY OTHER STATEMENTS TO CLARIFY THE WAIVER REQUEST.

[[Intersection sight distance is measured using a height of eye of 3.5 feet and height of object of 4.5 feet. The distance is measured from a point 10 feet back from the edge of paving.]]