

Turning Left Onto a Major Roadway -

Because it takes longer to turn and accelerate to operating speed than to go straight across an intersecting roadway, the critical sight distances are those required for turning movements. The driver must have sufficient sight distance to the left to cross the near lanes(s) without interfering with oncoming traffic. The driver must also have sufficient sight distance to the right to turn left and accelerate to a speed where oncoming traffic is not significantly impaired.

The sight distance required to the left are calculated from:

$$d_L = 0.28V(2.0 + t_a)$$

where: d_L = sight distance required to the left along the major roadway from the intersection (m).
 V = design speed on the major roadway (kph)
 t_a = time required to accelerate and traverse the distance to clear the traffic in the lane approaching from the left.

The required sight distance to the right is based on the assumption that the mainline vehicle will slow to 85 percent of the design speed and maintain a 2.0 second gap from the turning vehicle. To calculate the necessary sight distance first determine from Figure 400.06 the distance P required for the turning vehicle to reach a speed of 85 percent of the mainline design speed. The sight distance required to the right is calculated from:

$$d_R = (t+2)(.28)(.95V) - (P-5- (.56)(.85V) - L_v)$$

where: d_R = Sight distance required to the right along the major roadway from the intersection (m).
 T = time required to travel distance P (Table 400.01).
 V = mainline design speed (kph)
 L_v = Vehicle Length (m)

Turning Right Onto a Major Roadway - The right-turning-vehicle must have sufficient sight distance to the left to complete its turn and accelerate to a predetermined speed before being overtaken by approaching traffic travelling at the same predetermined speed. The sight distance

requirement for the right-turn maneuver is approximately one meter less than that required for the left-turn maneuver in "Turning Left Onto a Major Roadway". See Figure 400.07 curve Cb for the required sight distance for a vehicle turning right and accelerating to 85 percent of the design speed before being overtaken by vehicles slowing to 85 percent of design speed. Trucks will take considerably longer than passenger vehicles.

Signal Control - Because of unanticipated vehicle conflicts at signalized intersections, (such as, signal violations, right-turns on red, signal malfunction, or use of flashing red/yellow mode) **the requirements for Stop Controlled intersections should be met.** At intersections where right-turns on red are permitted, the departure sight line for right-turning vehicles should be determined by the methods for "Turning Right into a Major Roadway."

Stopped Vehicle Turning Left from a Major Roadway -

The driver will need sufficient sight distance ahead to turn left and clear the opposing travel lane(s) before an approaching vehicle reaches the intersection. The sight distance required is calculated from:

$$d = 0.28V(2.0 + t_a)$$

where: d = sight distance required along the major roadway from the intersection (m).
 V = design speed on the major roadway (kph)
 t_a = time required to accelerate and traverse the distance to clear the traffic in the approaching lane.

406.02 EFFECT OF SKEW

Intersection skew has no effect on sight distance requirements since they are measured along the intersecting legs. However, the sight triangle configuration is affected by skew. Care should be taken to verify that the area within the sight triangles can be constructed and maintained to provide a unobstructed view throughout the sight triangle with a 1070 mm eye height on the minor road to a 1300 mm object height on the major road.

Skew also affects the distance a vehicle travels to cross the intersection. Heavily skewed intersections should be controlled.