405 DESIGN VEHICLES

405.01 OFF TRACKING

A vehicle traveling around a circular curve sweeps a wider path than the width of the vehicle. The difference between the swept width and the vehicle width is called off tracking. On large trucks and buses offtracking can be significant and must be considered in design.

405.02 DESIGN VEHICLES

Intersection geometric design depends on the dimensional and operational characteristics of the vehicles involved. The American Association of State Highway and Transportation Officials have adopted "design vehicles" representing the various classes of commonly used vehicles.

For freeways and expressways, the design vehicle shall be a WB-12 medium tractor semi-trailer combination. For arterials, collectors and sector roads, the design vehicle will be a single unit bus. Design vehicles are as defined in “A Policy on Geometric Design of Highways and Streets”, AASHTO, 1994. Dimensions for various design vehicles are shown in Figure 400.02.

405.03 TURNING TEMPLATES

Turning templates are used to locate the turning paths of large vehicles. The template is used to determine corner radii, position island noses, establish clearances and the width of channeled separate turning lanes. Turning templates for the various design vehicles are shown in Figure 400.03. It should be noted that state-of-the-art turning template computer software exists which can be used in-lieu of Figure 400.03.

406 INTERSECTION DESIGN STANDARDS

406.01 SIGHT DISTANCE

General - The Driver of a vehicle should have an unobstructed view of the entire intersection. Stopping sight distance shall be the minimum provided throughout all parts of intersections.

Approach Sight Triangle - The area bounded by the required sight distances along the intersection legs and the sight line connecting their ends is known as the "sight triangle". See Figure 400.04.

Unobstructed sight distance along all intersection approaches and across the included corners must be sufficient to permit operators of approaching vehicles to perceive each other, react and complete an appropriate accelerating, slowing or stopping maneuver. If all corners of the intersection cannot be cleared and maintained to provide unobstructed views in the approach sight triangle, the intersection shall have stop control imposed.

Departure Sight Triangle - The departure sight triangle is bounded by the location of the stopped driver, the appropriate sight distance along the intersecting road, and the connecting sight line. See Figure 400.04. The driver must have sufficient sight distance along the intersecting legs to make a safe departure movement. All corners of the intersection shall be constructed to provide a clear line of sight throughout the departing sight triangle.

Intersection Controls - The following controls apply to at-grade intersections.

- **No Control -** vehicles need sufficient sight distance to adjust their speed.
- **Yield Control -** Vehicles on minor roadway yield to vehicles on major roadway.
- **Stop Control -** Vehicles on minor roadway stop at major roadway.
- **Signal Control -** All legs are controlled by either stop signs or traffic signals.
- **Left-turn Control -** Stopped left-turning vehicles on minor roadway must yield to opposing vehicles on major roadway.

No Control - For a given speed, the approach sight triangle is determined from Figure 400.04 and Table 400.01. Departure sight triangles should be commensurate with those provided at stop controlled intersections.