

Level of Service Definitions

The following descriptions have been adopted directly from the Transportation Research Board's *Highway Capacity Manual (HCM 2000)*, *Fourth Edition*. The methodologies used in the preceding report are consistent with the descriptions listed herein and within the original text.

Quality of service requires quantitative measures to characterize operational conditions within a traffic stream. Level of service (LOS) is a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience.

Six levels of service are defined for each type of facility that has analysis procedures available. Letters designate each level, from A to F, with LOS A representing the best operating conditions and LOS F the worst. Each level of service represents a range of operating conditions and the driver's perception of those conditions. Safety is not included in the measures that establish service levels.

SERVICE FLOW RATES

The analytical methods in the HCM 2000 attempt to establish or predict the maximum flow rate for various facilities at each level of service—except for LOS F, for which the flows are unstable or the vehicle delay is high. Thus, each facility has five service flow rates, one for each level of service (A through E). For LOS F, it is difficult to predict flow due to stop-and-start conditions.

The service flow rate is the maximum hourly rate at which persons or vehicles reasonably can be expected to traverse a point or uniform segment of a lane or roadway during a given period under prevailing roadway, traffic, and control conditions while maintaining a designated level of service. The service flow rates generally are based on a 15-minute period. Typically, the hourly service flow rate is defined as four times the peak 15-minute volume.

Note that service flow rates are discrete values, whereas levels of service represent a range of conditions. Because the service flow rates are the maximums for each level of service, they effectively define the flow boundaries between levels of service.

Most design or planning efforts typically use service flow rates at LOS C or D, to ensure an acceptable operating service for facility users.

SIGNALIZED INTERSECTIONS LEVEL OF SERVICE

The average control delay per vehicle is estimated for each lane group and aggregated for each approach and for the intersection as a whole. LOS is directly related to the control delay value. The criteria are listed in the following table.

Level of Service Criteria for Signalized Intersections	
Level of Service	Control Delay per Vehicle (Sec/Veh)
A	≤ 10
B	>10 - 20
C	>20 - 35
D	>35 - 55
E	>55 - 80
F	>80

Source: Highway Capacity Manual 2000, Exhibit 16-2.

UNSIGNALIZED INTERSECTIONS LEVEL OF SERVICE

Level of service (LOS) for a TWSC intersection is determined by the computed or measure control delay and is defined for each minor movement. LOS is not defined for the intersection as a whole. LOS criteria are shown in the following table.

Level of Service Criteria for TWSC* Intersections	
Level of Service	Average Control Delay (Sec/Veh)
A	0 - 10
B	>10 - 15
C	>15 - 25
D	>25 - 35
E	>35 - 50
F	>50
*TWSC - Two-Way Stop Controlled	
<i>Source: Highway Capacity Manual 2000, Exhibit 17-2.</i>	