435 Attachment 5

City of Framingham

Appendix 3 - Level of Service (LOS)

In § 435-47 of the Zoning Ordinance (Site plan review) the standard set forth for traffic impacts is based on the concept of level of service (LOS). "Level of service" is a qualitative measure of the operating condition of a transportation facility, such as an intersection or highway link, at specific traffic volumes. It is divided into six classes described as follows:

LOS	Operating Conditions
A	Free flow, low volume, high operating speed, high maneuverability.
B	Stable flow, moderate volume; speed somewhat restricted by traffic conditions, high maneuverability.
C	Stable flow, high volume; speed and maneuverability determined by traffic conditions.
D	Unstable flow, high volumes, tolerable but fluctuating operating speed and maneuverability.
E	Unstable flow, high volumes approaching roadway capacity, limited speed, intermittent vehicle queuing.
F	Forced flow, volumes lower than capacity due to very low speeds. Heavy queuing of vehicles, frequent stoppages.

[Source: "Quick-Response Urban Travel Estimation Techniques and Transferable Parameters: User's Guide," National Cooperative Highway Research Program Report 187, Transportation Research Board, National Research Council, 1978]

LOS is determined differently for highways, signalized intersections, and unsignalized intersections. Capacity and level of service of signalized intersections are determined using a procedure known as "critical movement analysis." In this method, LOS is determined by vehicle delay and "volume/capacity (V/C) ratio," which is the sum of critical volumes for the intersection divided by the theoretical capacity of the intersection. The following table summarizes the delay and V/C values for signalized intersections:

Level of Service	Typical V/C Ratio	Delay Range (sec./vehicle)
A	0.00 to 0.60	0.0 to 16.0
B	0.61 to 0.70	6.1 to 22.0
C	0.71 to 0.80	22.1 to 28.0
D	0.81 to 0.90	28.1 to 35.0
E	0.91 to 1.00	35.1 to 40.0
F	Varies	40.1 or greater

[Source: "Interim Materials on Highway Capacity," Transportation Research Circular No. 212, Transportation Research Board, National Academy of Sciences, January 1980, pp. 5 to 12.]