

ROADS AND INTERSECTIONS, CALCULATION OF FUTURE LEVEL OF SERVICE

2348. Hon Jim Scott to the Parliamentary Secretary representing the Minister for Planning and Infrastructure
Regarding the calculation of future Level of Service (LOS) for roads and intersections -

- (1) What factors are taken into account for the calculations?
- (2) What weighting is given to each LOS factor?
- (3) Does each LOS factor weighting change for each increment in years?
- (4) If so, how?
- (5) What methodology is used to assess each LOS factor for roads and intersections into the future?

Hon KEN TRAVERS replied:

- (1) At the most simple level, the factors upon which Level of Service (LOS) are ultimately calculated for each road element are;

Road Elements	Factor upon which LOS is based
Intersections	Total Delay (Average and Stopped)
Arterial Roads	Average Speed as a ratio with Posted Speed limit
Two Lane Rural Highways the	Average Speed as a ratio with Posted Speed and percentage of time spent following other vehicles
Freeways	Density (number of vehicles per lane km)
Freeway Interchanges (merges, diverges and weaving movements)	Density (number of vehicles per lane km)

However, inherent within the calculations of these factors are a large number of variables which include;

General Factors relating to all Road Elements

- Traffic Volume
- Lane width
- Clearance between lanes and roadside objects (eg proximity to and presence of barriers)
- Free flow speed
- The proportions of vehicle types (classes) within the traffic mix
- Road gradient (level, uphill, downhill)
- Horizontal Alignment

Additional Factors specific to Intersections

- Peak factors and the length of the peak period
- Availability of exclusive turn lanes
- Length of additional lanes on the exit from the intersection
- Length of additional lanes on the approach to the intersection
- Presence of full time or intermittent parking in the kerb lane
- Pedestrian activity

Additional Factors specific to Arterial Roads

- Impediments to through vehicles from vehicles turning at intersections/ driveways
- Presence of full time or intermittent parking in the kerb lane
- Location and form of bus-stops (eg indented bus bay or in lane)
- Pedestrian Activity
- The Development Environment

Additional Factors specific to Two Lane Rural Highways

- Passing opportunities

Additional Factors specific to Freeway Junctions

- Length of acceleration and deceleration lanes
- Presence / Absence of adjacent or nearby on and off ramps

- (2) Each of these factors is used in the calculation of the key factor (eg delay, average speed etc) on which LOS is determined. The degree to which each factor affects LOS depends on a range of features based

on empirical studies which have been used to develop formulae and tables that ultimately form part of the calculation process. There is no uniform effect on the ultimate LOS as there are a number of inter-relationships between factors. For example, lane widths have a large influence on LOS in a high speed environment at high speeds but less of an influence at low speeds.

- (3) No.
- (4) Not applicable.
- (5) To calculate the LOS factor for roads and intersections in the future, estimates are made of those features which are expected to change. Future traffic volumes are generally the key element. However, there may be numerous other changes in the features of the road (for example increased access as an area develops from rural to urban) that must also be included within the calculations to arrive at an estimate of the future LOS.