

Final term exam for the academic year 2013-2014

Question 1 (15 marks)

Explain briefly what is meant by:

1. Each level of service represents range of operating conditions.
2. Weaving areas
3. Speed is not measure of effectiveness for freeway.
4. Percentage of time spent following in two way two lane road
5. No passing zones in the two way two lane road.

Question 2 (20 marks)

An urban freeway is to be designed using the following information:

- AADT is 52,000 veh/day
- K (proportion of AADT occurring during the peak hour): 0.15
- Directional distribution is 65:35
- Trucks: 10% of peak hour volume
- PHF is 0.90
- Lane width: 11 ft, Shoulder width: 10 ft
- Interchange density: 0.5 interchange/mile
- Terrain: rolling

Determine the number of lanes required to provide LOS C. Clearly state assumptions used for any values not given, and show all calculations required.

Question 3 (20 marks)

A segment of multilane highway in mountainous terrain has an access density of 3 accesses/ mile in both directions. The segment of the multilane is divided and has the following features:

- Six 11 ft wide lane

- Obstructions are 8 ft away from the travelled lane on the right direction and 5-ft wide median
- BFFS is 60 mile/hr
- Traffic volume is 4500 veh/hr/direction, 12% trucks, and 8% buses, PHF is 0.9
- Driver is not familiar with the road

Determine the level of service for this segment

Question 4 (15 marks)

An existing Class I two-lane highway is to be analyzed to determine the two-way level of service, given the following information:

PHV _ 600 veh/h with 60% in the peak direction

8% trucks and 2% recreational vehicles

PHF _ 0.86

No-passing zones: 40%

Rolling terrain

BFFS is 55 mi/h

Lane width is 11 ft and Shoulder width is 2 ft

8 access points per mile

Best wishes.....Dr. Ibrahim Ramadan