1. An urban freeway planned for an area with gently rolling terrain is to be designed to carry a directional design hour volume (DDHV) of 5,500 vph, with 10% trucks, and a phf of 0.92.

   The following design standards and assumptions are to be used:
   - 12 ft. lanes
   - adequate lateral clearance
   - nearly all commuter traffic in design hour
   - 60 mph free flow speed

   a) How many lanes are required?

   b) What is the total capacity of the new facility?

2. A 4-mile length of four-lane urban freeway, located in mountainous terrain, has a total of 12 interchanges. The 2100 veh peak hour volume consists of 11% trucks. Lanes are 11 ft. wide, and there are no lateral obstructions. PHF is 0.90. If the interchanges are equally distributed, find the LOS for the facility.

3. An eight lane (4 lanes each direction) urban freeway is on rolling terrain and has 11-ft lanes with a 4 ft right shoulder lateral clearance. The interchange density is 1.25 per mile. The directional peak-hour volume is 5400 vehicles with 11% trucks. The traffic stream consists of regular users, and the peak hour factor is 0.95. It has been decided that large trucks will be banned from the freeway during the peak hour.

   a. What will be the freeway’s level of service before and after the ban?

   b. What will be the difference in capacity after the ban?

4. Problem 6.9 in Mannering text.

5. Problem 6.29 in Mannering text.