

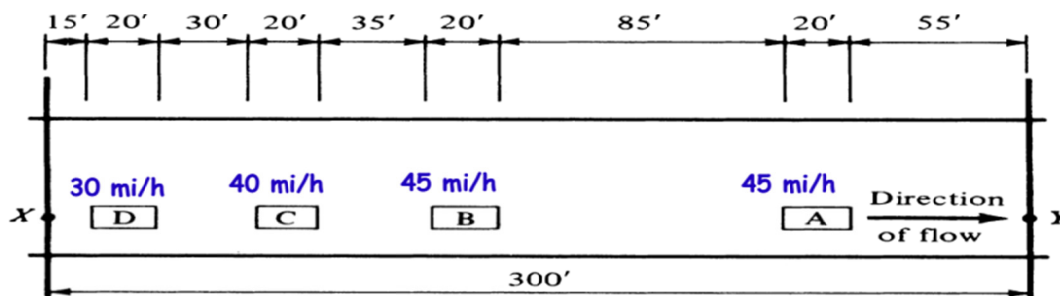
Sheet No(1)

Prob1: traffic counts were taken on a minor arterial street near a factory for consecutive four 15 minute periods during the peak hour. They were as follow: 264, 204, 357, and 305.

Determine the hour volume, the flow rate for each period, and the peak hour factor.

Prob2: vehicles traveling at constant speeds on a two-lane highway between sections X and Y. An observer located at point X observes the four vehicles passing point X during a period of T sec. The velocities of the vehicles are measured as 45, 45, 40, and 30 mi/h, respectively.

Calculate the flow, density, time mean speed, and space mean speed.



Prob3: The following travel times were measured for vehicles as they traversed a 2.0-mile segment of highway.

Compute the time mean speed (TMS) and space mean speed (SMS) for this data.

Why is SMS always lower than TMS?

vehicle	Travel time (sec)
1	156
2	144
3	144
4	168
5	126
6	132

Prob4: Observers stationed at two sections XX and YY, 500 ft apart on a highway, record the arrival times of four vehicles as shown in the accompanying table. If the total time of observation at XX was 15 sec, determine (a) the time mean speed, (b) the space mean speed, and (c) the flow at section XX.

vehicle	Section XX	Section YY
A	T	T+7.58
B	T+3	T+9.18
C	T+6	T+12.36
D	T+12	T+21.74

Prob5: A series of speed observations is given in the table below.

Vehicle	1	2	3	4	5	6	7	8	9	10
Speed km/h	88	75	99	83	91	88	94	100	79	83

Calculate the time mean speed and the space mean speed.

Prob6: The following measurements were taken from traffic on a road:

Headway sec/veh	2.3	2.4	3.8	2.3	2.6	2.4	3.7	3.1	3.7	4.1	3.2	2.4
Spacing m/veh	54.2	35.1	65.3	42.5	33.5	43.2	51.4	48.9	68.2	75.3	42.1	40.3

Calculate the mean headway, the flow rate, the mean spacing, the density, the space mean speed, and the jam density assuming linear speed-density relationship and free flow speed=100km/h.

Prob7: Two platoons of cars are timed over a distance of 0.5 km. Their flows are recorded. The first group is timed at 40 seconds, with the flow at 1350 vehicles per hour. The second group takes 45 seconds, with a flow

of 1800 vehicles per hour.

Determine the maximum flow of the traffic stream.

Prob8: a section of highway is known to have a free flow speed of 90 km/h and a capacity of 3300 veh/h. in a given hour, 2100 vehicles were counted at a specified point along this highway section, if the linear speed-density relationship applies,

what would you estimate the space mean speed of these vehicles to be?

Prob9: A section of highway has the following flow-density relationship: $Q=80K-0.4K^2$

What is the capacity of the highway section, the speed at capacity, and the density when the highway is at one-quarter of its capacity?

Prob10: assuming a linear speed density relationship, the free flow speed is 60 mph and the jam density is 140 vehicle/h. assume the Vehicle length 20ft.

Write down and draw V-K, Q-K, and Q-V equations - compute speed and density at flow 1000 - compute average headway, spacing, gap,

And clearance at the maximum flow
