CIVL 4162/6162 Traffic Engineering Assignment-2 Due: September 19, 2019 (Beginning of Class)

Question-1: Speed and density data was collected on a suburban freeway as shown below. Assume the data follow Greenshield's model.

- i. Using the data collected find the parameters for Greenshield's model.
- ii. Determine the maximum flow.
- iii. What is the value of density and flow corresponding to speed of 45 miles/hour?

Observation	Speed	Density	
1	79.8	30	
2	72.2	41	
3	67.2	53	
4	60.2	66	
5	56.0	78	
6	52.8	87	
7	51.2	90	
8	40.8	96	
9	30.6	105	
10	26.3	113	
11	21.9	123	
12	19.7	135	
13	16.8	150	
14	12.0	173	

Question-2: In the data given in Question-1, assume that the data follows Greenberg's model. Determine the following

- i. Write Greenberg model functional form using the data in Question-1.
- ii. Find the maximum flow?
- iii. For the given data which model performs better?

Question-3: The following data (Table 1) was collected during a study of two arterial lanes. Estimate the continuous 15-minute counts for the two-lane roadway as a whole. Find the following.

- i. Fill the periods where count data is not available
- ii. Peak hour
- iii. Peak hour factor

Beginning Time	End Time	Lane 1 (veh)	Lane 2 (veh)
3:30	3:40	200	
3:45	3:55		210
4:00	4:10	220	
4:15	4:25		236
4:30	4:40	240	
4:45	4:55		242
5:00	5:10	250	
5:15	5:25		254
5:30	5:40	275	
5:45	5:55		246
6:00	6:10	255	
6:15	6:25		236
6:30	6:40	225	
6:45	6:55		224
7:00	7:10	205	

Table 1: Arterial Count Data

Question-4: A small-network count was conducted for the network illustrated in Figure 1 using portable machine counts. Because only two field setups were available, the count program was conducted over a period of several days, using Station A as a control location. Using the data presented in Table 2 and 3 determine 8-hour volume for various days for coverage locations.



Figure 1: Network Control and Coverage Loc

Control Location-A		Coverage Count Location					
Begin	E	nd	Count		Begin	End	Count
Time	T	ime	(veh)	Location	Time	Time	(veh)
12	2	1	1245	1	12	1	1230
	l	2	1223	2	1	2	1125
	2	3	1380	3	2	3	1013
	3	4	1470	4	3	4	1050
2	1	5	1575	5	4	5	1680
4	5	6	1725	6	5	6	2040
(5	7	1410				

 Table 2: Hourly Control and Coverage Locations Data

7	8	600				
Table 3: Weekly Control and Coverage Locations Data						
Control	Location-A	Coverage Location				
	8-Hour					
Weekday	Count	Location	Weekday	8-Hour Count		
Monday-1	6480	1	Monday-1	6030		
Tuesday	6206	2	Tuesday	5927		
Wednesday	5850	3	Wednesday	5760		
Thursday	6390	4	Thursday	6120		
Friday	5306	5	Friday	6431		
Monday-2	6210	6	Monday-2	6143		

Question-5: The following origin and destination results (see Table 4) were obtained from sample license plate observations at four locations. A schematic diagram for four locations is shown in the Figure 2. Expand and adjust the initial trip table results to reflect the full population of vehicles during the study period.

Table 4: License Plate Survey Data

	Origin Station					
Destination Station	1	2	3	4	Row Sum	Volume
1	165	32	78	81	356	338
2	38	206	88	50	382	375
3	50	38	150	75	313	328
4	63	75	88	275	501	488
Column Sum	316	351	404	481		
Volume	325	356	413	463		



Figure 2: License Plate Survey Locations