TRAFFIC SIMULATION AND MODELLING ASSIGNMENT-5

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SOLUTION

Qn-1a:

Link list

Count: 39	No	Name	LinkBehavType	DisplayType	Level	NumLanes	Length2D
1	1		1: Urban (motorized)	1: Road gray	1: Base	1	183.702
2	2		1: Urban (motorized)	1: Road gray	1: Base	2	272.597
3	3		1: Urban (motorized)	1: Road gray	1: Base	1	216.197
4	4		1: Urban (motorized)	1: Road gray	1: Base	2	355.162
5	5		1: Urban (motorized)	1: Road gray	1: Base	1	235.738
6	6		1: Urban (motorized)	1: Road gray	1: Base	1	196.614
7	7		1: Urban (motorized)	1: Road gray	1: Base	1	137.410
8	8		1: Urban (motorized)	1: Road gray	1: Base	2	160.107
9	9		1: Urban (motorized)	1: Road gray	1: Base	2	159.804
10	10		1: Urban (motorized)	1: Road gray	1: Base	2	67.732
11	11		1: Urban (motorized)	1: Road gray	1: Base	1	85.468
12	12		1: Urban (motorized)	1: Road gray	1: Base	1	227.695
13	13		1: Urban (motorized)	1: Road gray	1: Base	2	145.528
14	14		1: Urban (motorized)	1: Road gray	1: Base	1	179.486
15	15		1: Urban (motorized)	1: Road gray	1: Base	3	239.438
16	16		1: Urban (motorized)	1: Road gray	1: Base	2	280.253
17	17		1: Urban (motorized)	1: Road gray	1: Base	2	241.751

Connector list

Count: 39	No	Name	LinkBehavType	DisplayType	Level	NumLanes	Length2D	IsConn	FromLink	ToLink	HasOvtLn
18	10000		1: Urban (motorized)	1: Road gray	/////	1	63.155	~	1	17	
19	10001		1: Urban (motorized)	1: Road gray		1	35.451	~	12	1	
20	10002		1: Urban (motorized)	1: Road gray		1	91.384	~	4	5	
21	10003		1: Urban (motorized)	1: Road gray		1	64.998	~	4	6	
22	10004		1: Urban (motorized)	1: Road gray		2	51.519	~	10	8	
23	10005		1: Urban (motorized)	1: Road gray		2	55.205	~	10	9	
24	10006		1: Urban (motorized)	1: Road gray		1	37.581	~	8	11	
25	10007		1: Urban (motorized)	1: Road gray		2	141.049	~	2	17	
26	10008		1: Urban (motorized)	1: Road gray		1	59.707	~	12	13	
27	10009		1: Urban (motorized)	1: Road gray		1	62.750	~	12	13	
28	10010		1: Urban (motorized)	1: Road gray		2	125.689	~	13	16	
29	10011		1: Urban (motorized)	1: Road gray		1	131.447	~	12	7	
30	10012		1: Urban (motorized)	1: Road gray		1	27.166	~	2	3	
31	10013		1: Urban (motorized)	1: Road gray		1	55.210	~	5	7	
32	10014		1: Urban (motorized)	1: Road gray		2	132.320	~	4	16	
33	10015		1: Urban (motorized)	1: Road gray		1	117.547	~	6	15	
34	10016		1: Urban (motorized)	1: Road gray		1	72.036	~	3	15	
35	10017		1: Urban (motorized)	1: Road gray		1	61.094	~	2	14	
36	10018		1: Urban (motorized)	1: Road gray		2	132.022	~	8	15	
37	10019		1: Urban (motorized)	1: Road gray		1	46.212	V	11	16	
38	10020		1: Urban (motorized)	1: Road gray		2	108.967	V	9	17	
39	10021		1: Urban (motorized)	1: Road gray		1	133.550	V	14	7	П

Vehicle information

Count: 5	No	Name	Link	Volume(0)	Volume(900)	Volume(1800)	Volume(2700)	VehComp(0)	VehComp(900)	VehComp(1800)	VehComp(2700)
1	2		10	282.0	282.0	282.0	282.0	1: Veh	1: Veh	1: Veh	1: Veh
2	3		4	164.0	164.0	164.0	164.0	1: Veh	1: Veh	1: Veh	1: Veh
3	4		12	682.0	682.0	682.0	682.0	1: Veh	1: Veh	1: Veh	1: Veh
4	5		2	135.0	135.0	135.0	135.0	1: Veh	1: Veh	1: Veh	1: Veh
5	6		15	0.0	0.0	0.0	0.0	1: Veh	1: Veh	1: Veh	1: Veh

Count: 7	No	Name	Category	Model2D3DDistr	ColorDistr1	OccupDistr	Capacity
1	100	Car	Car	10: Car	1: Default	1: Single Occupancy	0
2	200	HGV	HGV	20: HGV	1: Default		0
3	300	Bus	Bus	30: Bus	1: Default	1: Single Occupancy	110
4	400	Tram	Tram	40: Tram	1: Default	1: Single Occupancy	215
5	510	Man	Pedestrian	100: Man	101: Shirt Man		0
6	520	Woman	Pedestrian	200: Woman	201: Shirt Woman		0
7	600	Bike	Bike	60: Bike	101: Shirt Man		0

Qn-1b: Link 15, 16, 17 are selected for vehicle travel time measurement.

Count: 3	SimRun	TimeInt	VehicleTravelTimeMeasurement	Vehs(AII)	TravTm(All)	DistTrav(All)
1	3	0-600	1: link-17	9	3.67	220.77
2	3	0-600	2: link-15	37	4.15	232.53
3	3	0-600	3: link-16	39	4.83	267.90

Count: 3	No	Name	StartLink	StartPos	EndLink	EndPos	Dist
1	1	link-17	17	18.865	17	239.632	220.77
2	2	link-15	15	4.739	15	237.268	232.53
3	3	link-16	16	10.855	16	278.751	267.90

Qn-3:

A(t): cumulative arrivals from 0 to t

D(1): cumulative departures from 0 to t

Queue length at any time 't'

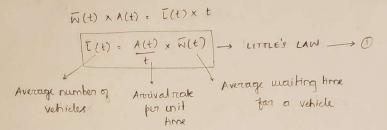
Total time opent by the vehicles (total maiting time)

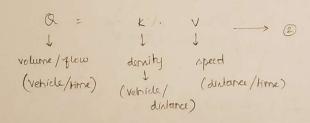
Average number of vehicles (average queue length)

when the system begins and ends in an empty state, the average waiting time is,

$$\bar{N}(t) = \frac{N(t)}{\Lambda(t)}$$
 \longrightarrow ②

from 1 and 1,





Dividing equ - (1) by 1- length of a alignment on both aides

$$\begin{array}{cccc}
\bigcirc \Rightarrow & \overline{L(t)} &= & \underline{A(t)} \times \overline{W(t)} \\
\downarrow & & \downarrow & & \downarrow \\
\hline
\text{Average no op} & & & & & \\
\hline
\text{Vehicles} & & & & & \\
\hline
\text{distance} & & & & \\
\downarrow & & & \downarrow & \\
\hline
\text{K} &= & & & \downarrow \\
\hline
\text{K} &= & & & \downarrow \\
\end{array}$$

$$K = Q \times \frac{1}{V}$$

$$\Rightarrow Q = K \cdot V$$