An-Najah National University
Nablus

Faculty of Engineering
Dept of Civil Engineering

10601563 - TRANSPORTATION PLANNING

HW # 3

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12-8 A small town has been divided into three traffic zones. An origin-destination survey was conducted earlier this year and yielded the number of trips between each zone as shown in the table below. Travel times between zones were also determined. Provide a trip distribution calculation using the gravity model for two iterations. Assume $K_{ij} = 1$.

The following table shows the number of productions and attractions in each zone.

Zone	*1*	*2*	*3*	*Total*
Productions	250	450	300	1000
Attractions	395	180	425	1000

The survey's results for the zones' travel time in minutes were as follows.

Zone	*1*	*2*	*3*
1	6	4	2
2	2	8	3
3	1	3	5

The following table shows travel time versus friction factor.

Time (min)	1	2	3	4	5	6	7	8
Friction Factor	82	52	50	41	39	26	20	13

12-9 The Jeffersonville Transportation Study Area has been divided into four large districts (traffic zones). The following data have been collected for those districts. Provide a trip distribution calculation using the gravity model for two iterations. Assume $K_{ij} = 1$.

			Travel Time (min)			
District	*Productions*	*Attractions*	*1*	*2*	*3*	*4*
1	3400	2800	4	11	15	10
2	6150	6500	11	6	6	9
3	3900	2550	15	6	6	11
4	2800	4400	10	9	11	4

Travel Time	1	4	6	9	10	11	12	15	20
F_{ij}	2.0	1.6	1.0	0.9	0.86	0.82	0.80	0.68	0.49

12-10 The following table shows the productions and attractions used in the first iteration of a trip distribution procedure and the productions and attractions that resulted. Determine the number of productions and attractions that should be used for each zone in the second iteration.

	1	*2*	*3*	*4*
P	100	200	400	600
A	300	100	200	700
P^1	100	200	400	600
A^1	250	150	300	600

12-11 The Jeffersonville Transportation Study Area has been divided into four large districts (traffic zones). The following data have been compiled:

			Travel Time (min)			
District	*Productions*	*Attractions*	*1*	*2*	*3*	*4*
1	1000	1000	5	8	12	15
2	2000	700	8	5	10	8
3	3000	6000	12	10	5	7
4	2200	500	15	8	7	5

Travel Time	1	5	6	7	8	10	12	15
F_{ij}	2.00	1.30	1.10	1.00	0.95	0.85	0.80	0.65

After the first iteration, the trip table was

District	*1*	*2*	*3*	*4*	P_S
1	183	94	677	46	1000
2	256	244	1372	128	2000
3	250	186	2404	160	3000
4	180	183	1657	180	2200
A_S	869	707	6110	514	8200

Complete the second iteration.