

Report

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University/College Name :

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Experiment No. 3

Singly Constrained Gravity Model (Origin)

October 30, 2021, 8:21 pm

Input Values :

Base Year Origin-Destination Cost Matrix			
Zone	1	2	3
1	3	10	15
2	10	5	10
3	15	10	5

Future Year Origins Total			
Zone	1	2	3
	10	15	8

Future Year Destinations Total			
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Zone	1	2	3
	7	16	10

Selected Impedance Functions : Power Function [$F_{ij} = C_{ij}^B$]

B value = 3

Calculations :

Impedance Matrix Calculations (Fij)			
Zone	1	2	3
1	27	1000	3375
2	1000	125	1000
3	3375	1000	125



Dij*Fij				
Zone	1	2	3	Sum Dij*Fij
1	189	16000	33750	49939
2	7000	2000	10000	19000
3	23625	16000	1250	40875

Interaction Probabilities (Pij)			
Zone	1	2	3
1	0.0038	0.3204	0.6758
2	0.3684	0.1053	0.5263
3	0.578	0.3914	0.0306

Final Result



Urban Transportation Systems Engineering Lab

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Origin Destination Matrix Tij

Zone	1	2	3	Sum $D_j * F_{ij}$	Future year Origins Total
1	0.0378	3.2039	6.7582	10	10
2	5.5263	1.5789	7.8947	15	15
3	4.6239	3.1315	0.2446	8	8



Experiment No. 3

October 30, 2021, 8:22 pm

Singly Constrained Gravity Model(Destination)

Input Values :

Base Year Origin-Destination Cost Matrix			
Zone	1	2	3
1	3	10	15
2	10	5	10
3	15	10	5

Future Year Origins Total			
Zone	1	2	3
	10	15	8

Future Year Destinations Total			
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Zone	1	2	3
	7	16	10

Selected Impedance Functions : Exponential Function [$F_{ij} = e^{-(B)C_{ij}}$]

B value = 3

Calculations :

Impedance Matrix Calculations (Fij)			
Zone	1	2	3
1	0.0001	0	0
2	0	0	0
3	0	0	0



Oij*Fij			
Zone	1	2	3
1	0.0012	0	0
2	0	0	0
3	0	0	0
Sum Oij*Fij	0.0012	0	0

Interaction Probabilities (Pij)			
Zone	1	2	3
1	1	0	0
2	0	1	0
3	0	0	1

Final Result

Origin Destination Matrix Tij



Zone	1	2	3
1	7	0	0
2	0	16	0
3	0	0	10
Sum $O_i * F_{ij}$	7	16	10
Future year Destinations Total	7	16	10



Experiment No. 3

Singly Constrained Gravity Model (Origin)

October 30, 2021, 8:21 pm

Input Values :

Base Year Origin-Destination Cost Matrix			
Zone	1	2	3
1	3	10	15
2	10	5	10
3	15	10	5

Future Year Origins Total			
Zone	1	2	3
	10	15	8

Future Year Destinations Total			
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Zone	1	2	3
	7	16	10

Selected Impedance Functions : Power Function [$F_{ij} = C_{ij}^B$]

B value = 3

Calculations :

Impedance Matrix Calculations (Fij)			
Zone	1	2	3
1	27	1000	3375
2	1000	125	1000
3	3375	1000	125



Dij*Fij				
Zone	1	2	3	Sum Dij*Fij
1	189	16000	33750	49939
2	7000	2000	10000	19000
3	23625	16000	1250	40875

Interaction Probabilities (Pij)			
Zone	1	2	3
1	0.0038	0.3204	0.6758
2	0.3684	0.1053	0.5263
3	0.578	0.3914	0.0306

Final Result



Origin Destination Matrix Tij					
Zone	1	2	3	Sum Dj*Fij	Future year Origins Total
1	0.0378	3.2039	6.7582	10	10
2	5.5263	1.5789	7.8947	15	15
3	4.6239	3.1315	0.2446	8	8