

CEE 123 Transport Systems 3: Planning & Forecasting

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Homework #7 -- Model Adjustments [Due: Friday, 29 May 2024]

Homework 6 utilized data pertaining to a hypothetical five zone region. The data set included surveyed production, attractions, and activity system variables for 2020, as well as estimates of activity system variables for the year 2030.

Table 1a. HBW Productions and Attractions ; Network Travel Times

From\To	-Base Travel Time-					-Base Trips-		-Base Demo-		-Future Demo-	
	1	2	3	4	5	PROD	ATTR	WORK	EMPL	WORK	EMPL
1	1	3	3	6	3	0	450	0	220	0	216
2	3	1	2	6	5	0	250	0	110	0	118
3	3	2	1	5	6	300	0	140	0	250	0
4	6	6	5	1	4	0	300	0	140	0	166
5	3	5	6	4	1	700	0	360	0	472	166
Totals						1000	1000	500	470	722	666

Table 1b. Base HBW Trip Table

FROM\TO	1	2	4	Prod
3	125	125	50	300
5	325	125	250	700
Attr	450	250	300	1000

In Homework 6, a HBW trip gravity model was calibrated for the region, and forecasts were completed for both trip generation and distribution (with assumed network and activity system changes). The following problems continue with the sequence of analysis.

Problem 6. Trip Table Adjustments 1 [15 points]

Using the **base** 24-hour Home-based Work (HBW) person-trip production-attraction matrix in Table 1b and the Table 6 conversion factors, **produce** the corresponding (a) AM-peak, (b) PM-peak, and (c) off-peak period origin-destination matrices for HBW person-trips.

Table 6. Temporal Distribution of Trips by Purpose (PA-to-OD)

Analysis Period	--- HBW ---		-- HBO --		-- NHB --	
	P-A	A-P	P-A	A-P	P-A	A-P
1. AM-peak (7-9:00am)	0.30	0.00	0.08	0.02	0.04	0.04
2. PM-peak (4-7:00pm)	0.03	0.30	0.09	0.15	0.12	0.12
3. Off-peak (other)	0.17	0.20	0.33	0.33	0.34	0.34

Problem 7. Trip Table Adjustments 2 [5 points]

Convert the *AM-peak HBW O-D matrix of person-trips* (see Problem 6) to vehicle trips, using Table 7 parameters. **Report** in O-D matrix format.

Table 7. Base Year Vehicle Occupancy by Trip Purpose

Type	Trip purpose	Average Vehicle Occupancy
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1. HBW	Home-based Work	1.10 persons/vehicle
2. HBO	Home-based Other	1.40 persons/vehicle
3. NHB	Non-home-based	1.20 persons/vehicle

NOTE: HW 6 through 8 provide a useful exercise which illustrates the sequential application of the four step model and, thus, serves as excellent preparation for the final exam.

Last Updated: 16 May 2024