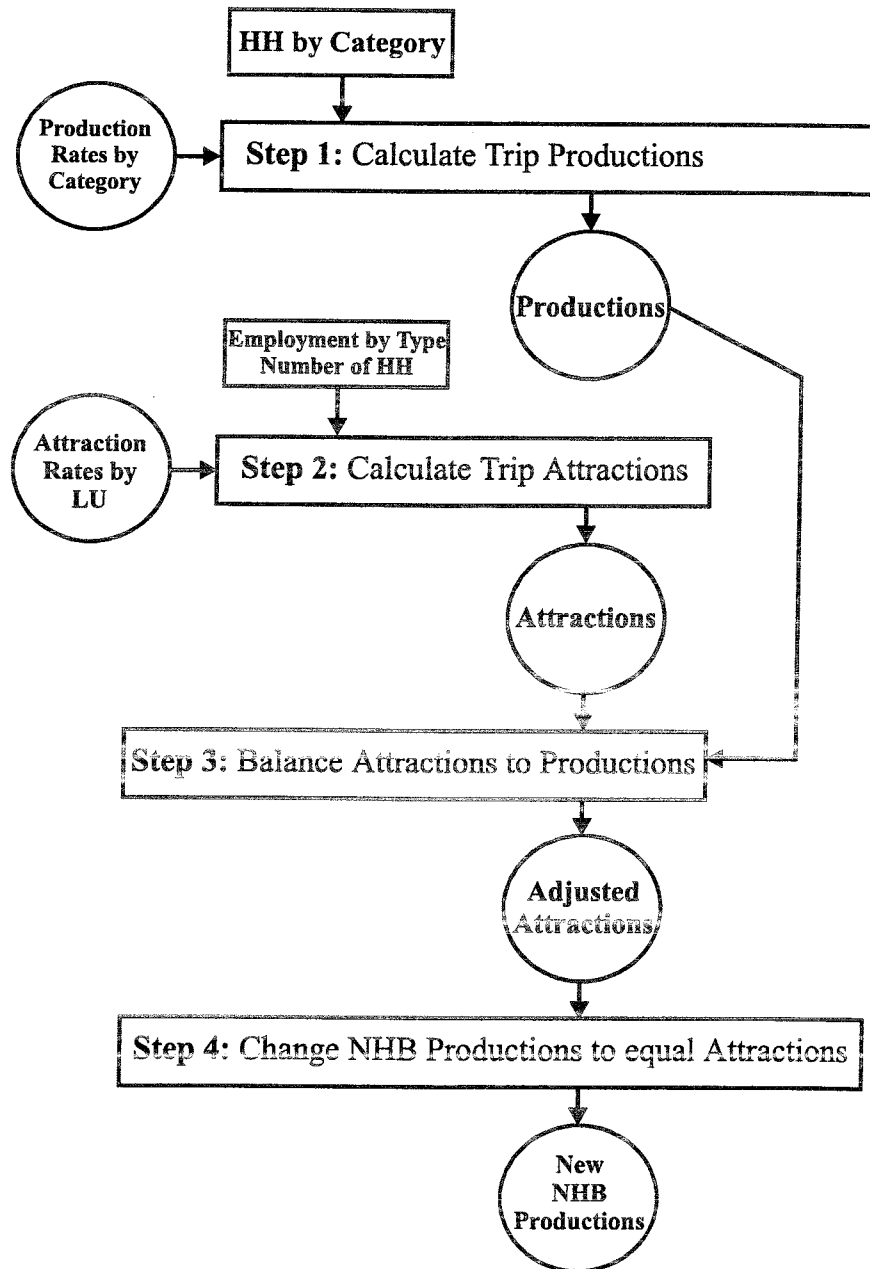

Session 5: Trip Generation Workshop



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The **trip production models** are cross-classification models, with households classified by income group only. Generally, households would be cross-classified by at least two variables. In our example, we will classify households by just one variable, thus reducing the number of computations to be done.

The **trip attraction models** are trip rate models, with up to three variables.

In this workshop, (1) you will calculate productions for Zone 5, (2) calculate attractions for Zone 5, (3) balance productions and attractions for the urban area, and (4) modify the non-home based productions based on non-home based attractions.

Trip production and trip attraction models calibrated for UTOWN are provided below, and socioeconomic data are provided on the following page.

Trip Generation Models

Trip Attraction Rates (Person Trips)

$$HBW = 1.7 \times (\text{Total Employment})$$

$$HBO = 10.0 \times (\text{Retail Employment}) \\ + 0.5 \times (\text{Non-Retail Employment}) \\ + 1.0 \times (\text{Households})$$

$$NHB = 2.0 \times (\text{Retail Employment}) \\ + 2.5 \times (\text{Non-Retail Employment}) \\ + 0.5 \times (\text{Households})$$

Trip Production Rates (Person trips/ Household)

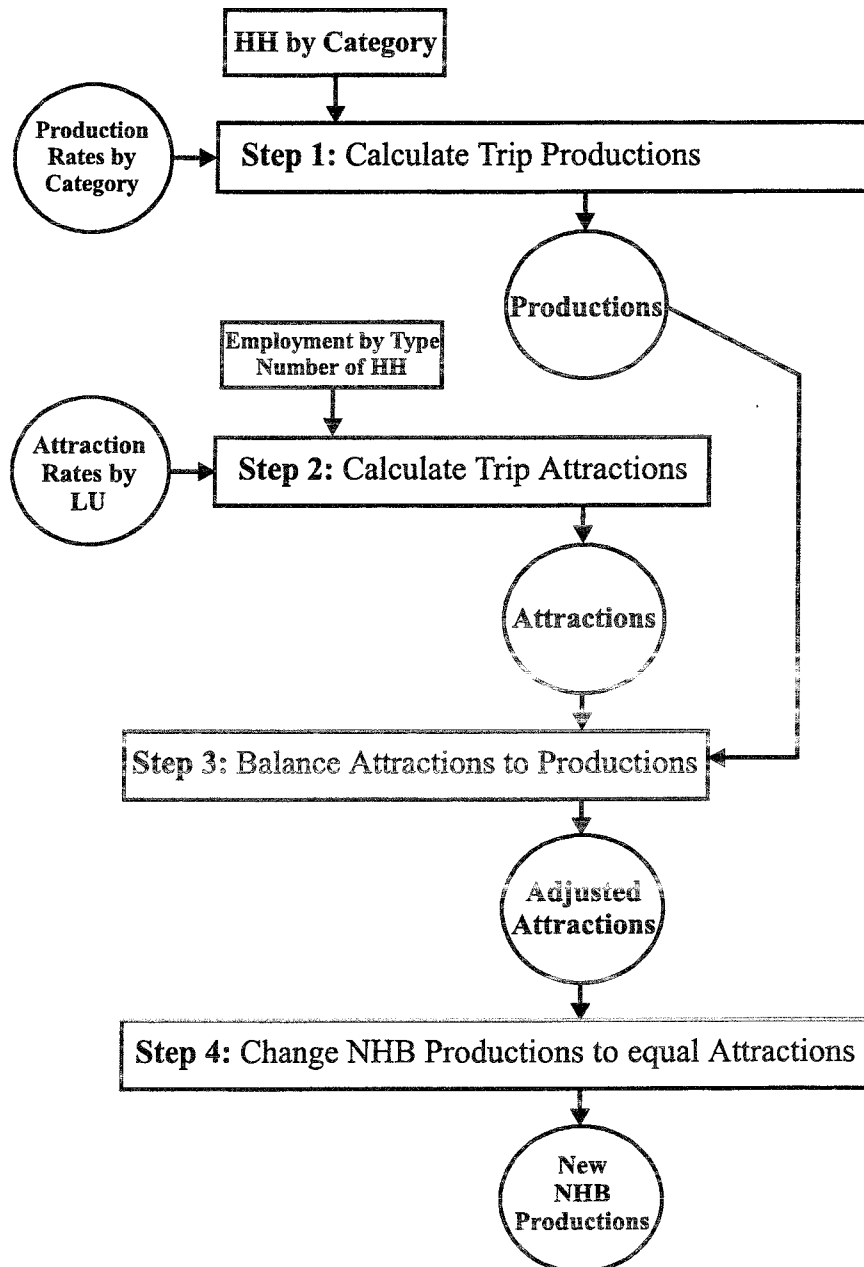
Purpose	Income Group				
	1	2	3	4	5
HBW	0.63	0.90	1.47	1.99	2.10
HBO	2.84	3.32	3.31	3.19	3.16
NHB	1.56	2.22	2.54	2.93	3.11

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SOCIOECONOMIC DATA FOR UTOWN

	<u>ZONE 1</u>	<u>ZONE 2</u>	<u>ZONE 3</u>	<u>ZONE 4</u>	<u>ZONE 5</u>
Total households	4,967	16,633	16,280	7,570	16,470
HH inc. gr. 1	1,000	3,000	1,100	50	300
HH inc. gr. 2	1,170	4,280	1,310	690	420
HH inc. gr. 3	2,280	7,620	8,745	4,305	7,200
HH inc. gr. 4	300	933	3,125	1,525	4,550
HH inc. gr. 5	217	800	2,000	1,000	4,000
Total employment	39,990	10,635	15,815	4,995	5,400
Retail emp.	3,990	2,000	3,815	995	1,400
Non-retail emp.	36,000	8,635	12,000	4,000	4,000

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Step 1: Apply the Trip Production Models to the following matrix. (Trip rates per HH are shown in parenthesis at the top of each column.) The first four zones have been completed for you, apply the production models to Zone 5 then compute the trip total.

A. HBW Productions

Zone/Desc	Income Group/Trip Rates					Trip Total
	1 (0.63)	2 (0.9)	3 (1.47)	4 (1.99)	5 (2.10)	
1 Households	1,000	1,170	2,280	300	217	
Trips	630	1,053	3,352	597	456	6,088
2 Households	3,000	4,280	7,620	933	800	
Trips	1,890	3,852	11,201	1,857	1,680	20,480
3 Households	1,100	1,310	8,745	3,125	2,000	
Trips	693	1,179	12,855	6,219	4,200	25,146
4 Households	50	690	4,305	1,525	1,000	
Trips	32	621	6,328	3,035	2,100	12,116
5 Households						
Trips						
Total Trips						

Session 5: Trip Generation Workshop

B. HBO Productions

Zone	Income Group/Trip Rates					Trip Total
	1 (2.84)	2 (3.32)	3 (3.31)	4 (3.19)	5 (3.16)	
1 Households	1,000	1,170	2,280	300	217	
Trips	2,840	3,884	7,547	957	686	15,914
2 Households	3,000	4,280	7,620	933	800	
Trips	8,529	14,210	25,222	2,976	2,526	53,256
3 Households	1,100	1,310	8,745	3,125	2,000	
Trips	3,124	4,349	28,946	9,969	6,320	52,708
4 Households	50	690	4,305	1,525	1,000	
Trips	142	2,291	14,250	4,865	3,160	24,708
5 Households						
Trips						
Total Trips						

Session 5: Trip Generation Workshop

C. NHB Productions

Zone/Desc	Income Group/Trip Rates					Trip Total
	1 (1.56)	2 (2.22)	3 (2.54)	4 (2.93)	5 (3.11)	
1 Households	1,000	1,170	2,280	300	217	
Trips	1,560	2,597	5,791	879	675	11,502
2 Households	3,000	4,280	7,620	933	800	
Trips	4,680	9,502	19,355	2,734	2,488	38,758
3 Households	1,100	1,310	8,745	3,125	2,000	
Trips	1,716	2,908	22,212	9,156	6,220	42,212
4 Households	50	690	4,305	1,525	1,000	
Trips	78	1,532	10,935	4,468	3,110	20,123
5 Households						
Trips						
Total Trips						

Step 2: Apply the Trip Attraction Models to the next three matrices. Once again, the first four zones have been completed for you; apply the attraction models to zone five, then compute the trip total.

A. HBW Attraction

Zone/Desc	Zonal Variables	Trip Total
	Total Emp	
	(1.70)	
1 Zonal Data	39,990	
Trips	67,983	67,983
2 Zonal Data	10,635	
Trips	18,080	18,080
3 Zonal Data	15,815	
Trips	26,886	26,886
4 Zonal Data	4,995	
Trips	8,492	8,492
5 Zonal Data		
Trips		
Total Trips		

Session 5: Trip Generation Workshop

B. HBO Attractions

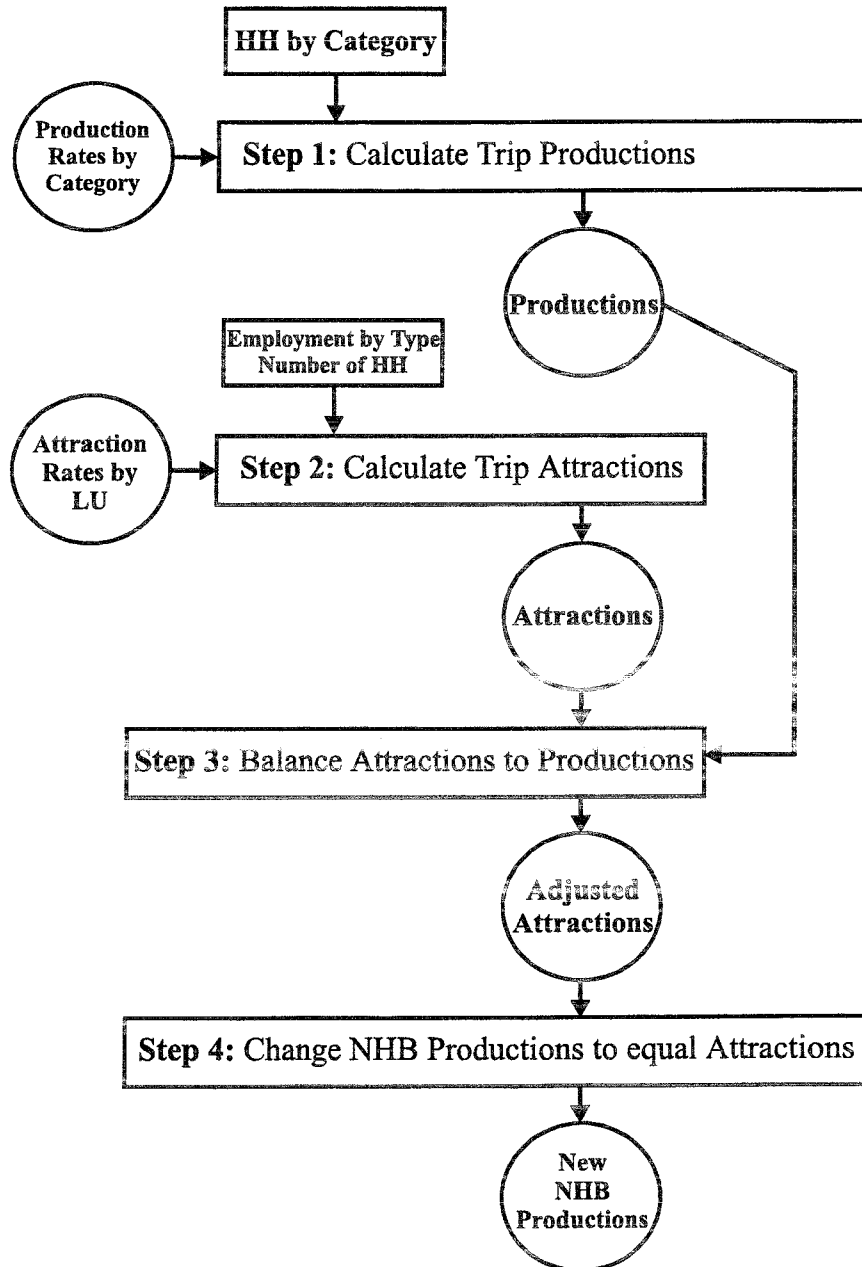
Zone/Desc	Zonal Variables			Trip Total
	Retail Emp	Non-Retail	Households	
	(10.00)	(0.50)	(1.00)	
1 Households	3,990	36,000	4,967	
Trips	39,900	18,000	4,967	62,867
2 Households	2,000	8,635	16,633	
Trips	20,000	4,318	16,633	40,951
3 Households	3,815	12,000	16,280	
Trips	38,150	6,000	16,280	60,430
4 Households	995	4,000	7,570	
Trips	9,950	2,000	7,570	19,520
5 Households				
Trips				
Total Trips				

Session 5: Trip Generation Workshop

C. NHB Attractions

Zone/Desc	Zonal Variables			Trip Total
	Retail Emp	Non-Retail	Households	
	(2.00)	(2.50)	(.50)	
1 Households	3,990	36,000	4,967	
Trips	7,980	90,000	2,484	100,464
2 Households	2,000	8,635	16,633	
Trips	4,000	21,588	8,317	33,905
3 Households	3,815	12,000	16,280	
Trips	7,630	30,000	8,140	45,770
4 Households	995	4,000	7,570	
Trips	1,990	10,000	3,785	15,775
5 Households				
Trips				
Total Trips				

Session 5: Trip Generation Workshop



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Step 3: Balance Attractions to Productions

(Note: Fill in the productions and attractions you calculated for HBW. Then calculate totals for HBW trips and production/attraction adjustment factors. Zone 5 HBW productions and attractions and the totals come from Pages 5-35 and 5-39 respectively.)

A. Calculate productions and attractions

Zone	HBW		HBO		NHB	
	P	A	P	A	P	A
1	6,088	67,983	15,914	62,867	11,502	100,464
2	20,480	18,080	53,256	40,951	38,758	33,905
3	25,146	26,886	52,708	60,430	42,212	45,770
4	12,116	8,492	24,708	19,520	20,123	15,775
5			53,233	32,470	45,460	21,035
Total			199,819	216,238	158,055	216,949

B. Calculate production/attraction adjustment factors (use five digits, e.g., 0.12345)

P/A = Factor

0.92407

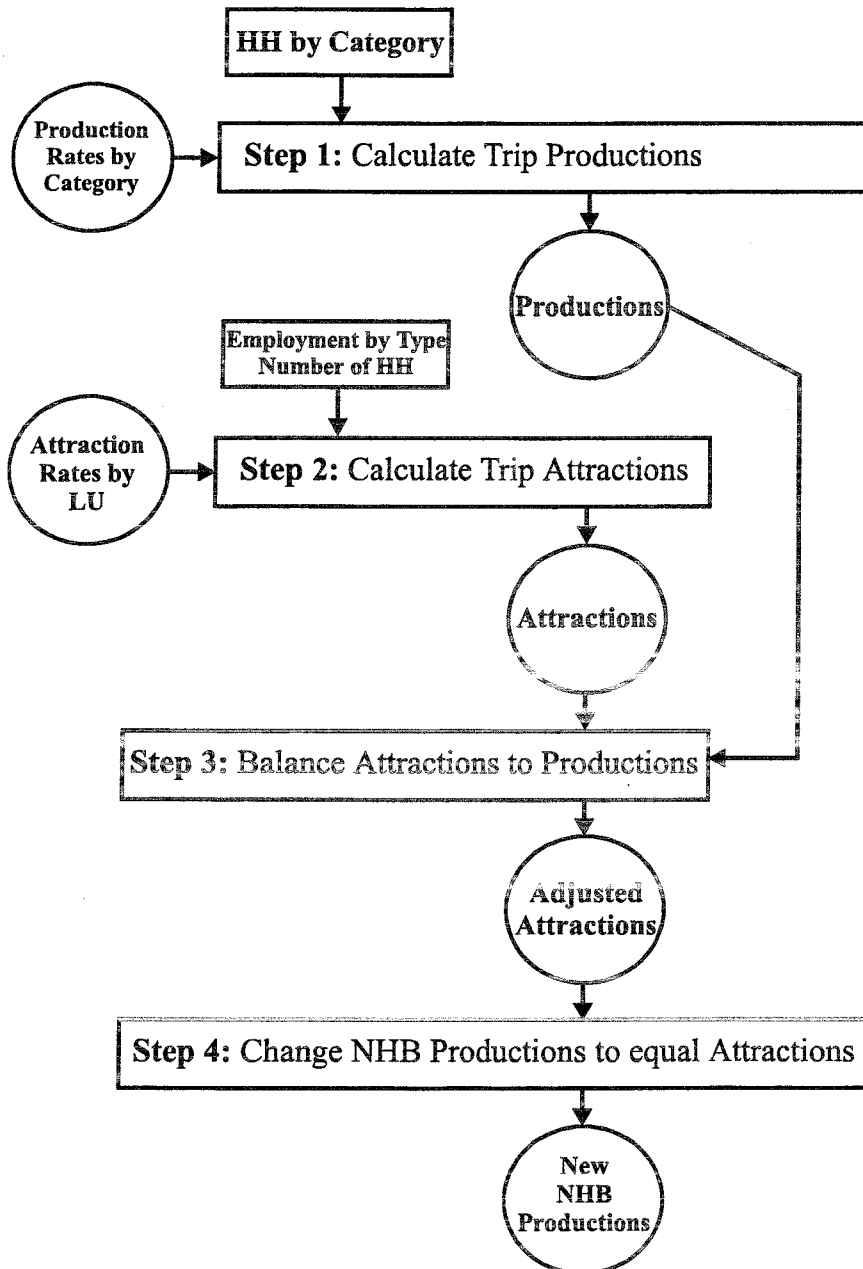
0.72854

C. Calculate adjusted attractions

(Note: Multiply production/adjustment factor by attractions in "A" above and record these adjusted attractions below)

Zone	HBW		HBO		NHB	
	P	A	P	A	P	A
1	6,088		15,914	58,093	11,502	73,192
2	20,480		53,256	37,842	38,758	24,701
3	25,146		52,708	55,842	42,212	33,345
4	12,116		24,708	18,038	20,123	11,493
5	28,606		53,233	30,005	45,460	15,325
Total	92,436		199,819	199,820	158,055	158,056

Session 5: Trip Generation Workshop



Session 5: Trip Generation Workshop

Step 4. Prepare final NHB Productions and Attractions. (Place the adjusted attractions in the productions column.)

Non-Home Based (NHB)		
Zone	P's	A's
1		73,192
2		24,701
3		33,345
4		11,493
5		15,325
Total		158,055