

برنامه ریزی حمل و نقل

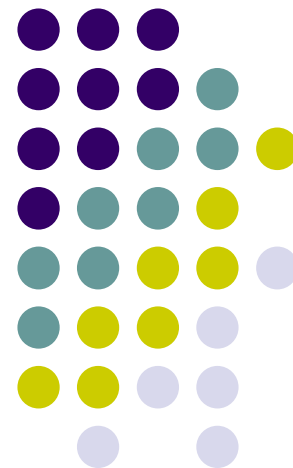
وزارت علوم، تحقیقات و فناوری



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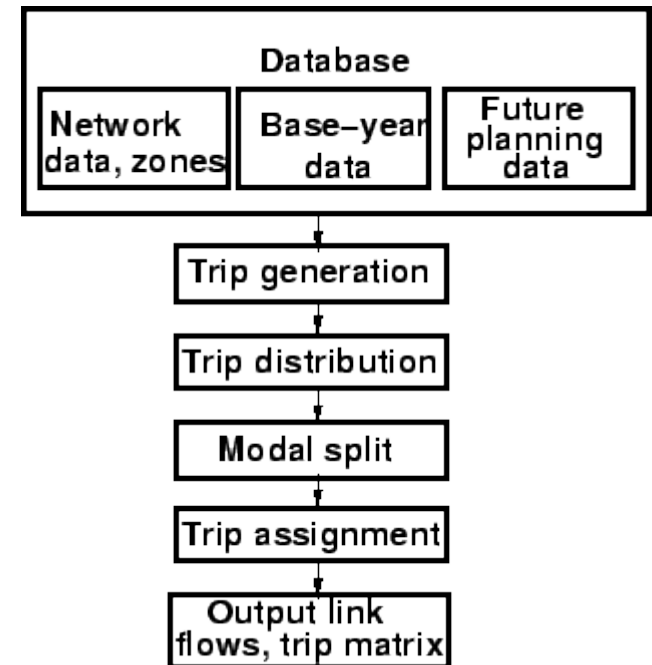
Trip Generation

● Overview

- “predicting the total number of trips generated and attracted to each zone” or “how many trips?”
- the data on household and socioeconomic attributes

The section discussions:

- basic definitions?
- factors affecting trip generation
- the two main modeling approaches (growth factor modeling and regression modeling)



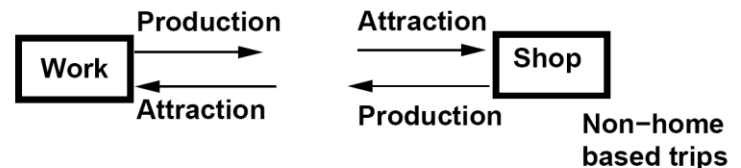
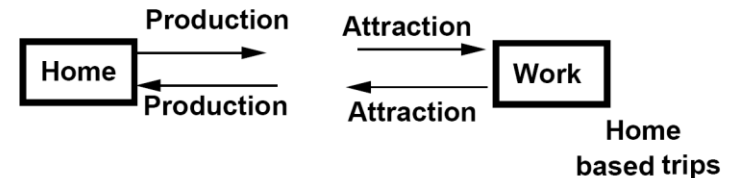
Trip Generation

● Types of Trip

- **Journey:** movement from origin to destination
- **Trip:** an outward and return journey
- **Home-based trip:** origin or destination of a trip is home
- **Non home-based trip:** neither origin nor destination of a trip is home

● **Trip Production:** trips of home based or origin of non home based trips

● **purpose of journey:** work, education, shopping, recreation, others



Trip Generation



● Factors Affecting Trip Generation

- **Trip Production**
 - Income , vehicle ownership , house hold structure , family size
 - value of land , residential density , accessibility
- **Trip Attraction**
 - roofed space available for industrial, commercial and other services
 - Employment ,accessibility

Freight Trips

- Number of employees, number of sales and area of commercial firms

Trip generation

● Growth Factor Modeling

- **T_i** : number of future trips in the zone
- **t_i** : number of current trips in the zone
- **f_i** : growth factor
- **P** : population of the zone
- **I** : average house hold income
- **V** : average vehicle ownership
- **d** : the design year
- **c** : the current year

$$T_i = f_i \times t_i$$

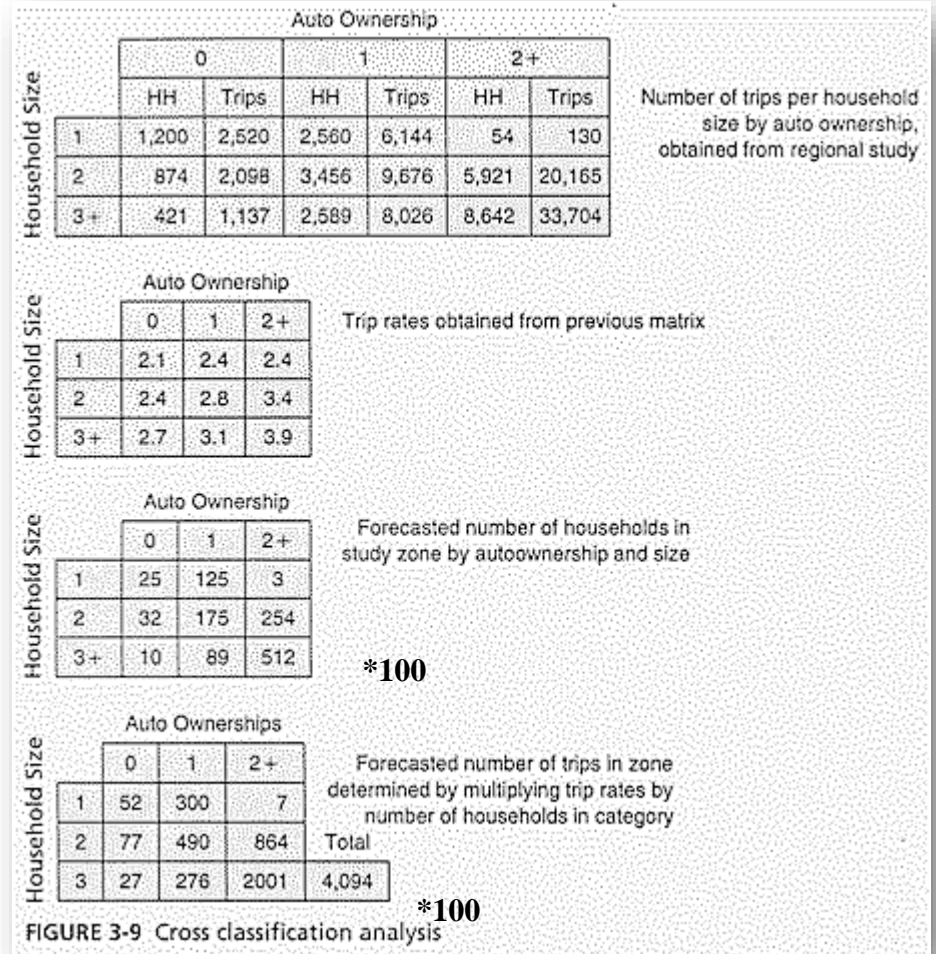
$$f_i = \frac{P_i^d \times I_i^d \times V_i^d}{P_i^c \times I_i^c \times V_i^c}$$

Limitation: the trip rate will remain same in the future

Trip Generation

Cross-Classification Method

- **Income Sub-Model:**
households within various income categories
- **Auto Ownership Sub-Model:**
household income to auto ownership.
- **Trip Production Sub-Model:**
relationship between the trips made by each household and the independent variables.
- **Trip Purpose Sub-Model:**
relates the trip purposes to income



Trip Generation

Regression Methods

$$T_i = f(x_1; x_2; x_3; \dots x_i; \dots x_k)$$

- x_i : prediction factor or explanatory variable

$$T_i = a_0 + a_1x_1 + a_2x_2 + \dots + a_ix_i + \dots + a_kx_k$$

- a_i : the coefficient of the regression equation (by regression analysis)

Trip Generation

- **Experience Based**
 - Extrapolation of past trends to estimate future travel
 - Trend analysis to respond to anticipated growth
 - Comparing the past traffic trend to the trend of development during the same period

