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TRIP GENERATION RATE OF EAST ZONE, SURAT CITY USING HOME INTERVIEW SURVEY

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Abstract: Trip generation is the first step of the four stage travel modeling process. It involves the estimation of the total number of trips entering or leaving a parcel of land per time period as a function of the socioeconomic and land use characteristics of the parcel. The aim of this research is to predict the number of trip generated by household in the east zone of the Surat city. The data consists of primary data, which was collected by conducting household survey. The survey consists of 1543 randomly selected household from east zone of the Surat city, the study area. The data collected related to socio economic and demographic data like age, gender, driving license holding status, family size, no. of vehicle per house hold (HH), income. According to this home interview survey, the average trip generated in the east zone of Surat city is 6.5.

Keywords: **Demographic data; Home interview survey; Socio economic data; Transportation; Trip generation,**

I. INTRODUCTION

The connection amongst transport and land utilize is essential: individual travel is the consequence of people participating in exercises spatially isolate from each other. The openness of transport permits people to take part in such exercises. Travel has costs as far as cash, time and accommodation. As a result of this it is for the most part expected that objective people endeavor to limit these expenses in their decision of home and work environment area and the geographic spread of the exercises in which they take an interest.

Both movement volume and travel mode are firmly identified with land utilize design. Auto utilize is encouraged in less-thickly populated ranges, where open transport is a more functional and financial option in more thickly populated zones. The issues of auto reliance and manageability can in this way just be tended to by a more broad discourse of urban from and arrive utilize arrangements.

We would anticipate that higher densities will be related with shorter, more incessant excursion and a more noteworthy utilization of open transport, cycling and strolling. Higher thickness is related with more regular and available open transport administrations and the vicinity of conceivable goals takes into account short walk or bicycle trips, while blockage and stopping expenses and shortage diminishes the appeal of private autos. The exact confirmation proposes that auto possession and utilize decay and open transport utilize increments with urban thickness, while urban thickness, while the outcomes concerning absolute go as far as outings is less obvious.

Another part of land utilize concerns nearby access to employments, shops, administrations, relaxation exercises and different offices. We could anticipate that high nearby availability will diminish travel separations, however it can likewise be contended that optional trek increment with openness and turn out to be more effective when availability is low, that less outings are made that there are more multi-reason trips. Lamentably, the experimental proof is fairly restricted.

Arrive utilize attributes likewise incorporate urban frame (huge urban communities verses little towns) and the separation to urban focuses. Expansive towns and urban areas give more open doors share in different exercises, which will thusly prompt more excursions and travel. Then again, little towns and country regions will do not have the differences of exercises, so individuals may take an interest less in this manner voyaging less or on the other hand go to longer focuses, along these lines expanding travel. Again there is minimal exact proof concerning these impacts.

Arrive utilize is characterized regarding the attributes of the private area of the people: populace thickness, urban size, the vicinity and recurrence of open transport options and separation to offices for shopping, administrations, relaxation and so on. The investigation depends on perception of people travel conduct and a thorough model which consider the extensive variety of element which impact it, i.e. financial variable (wage, family unit structure, and so on.), and additionally arrive utilize attributes.

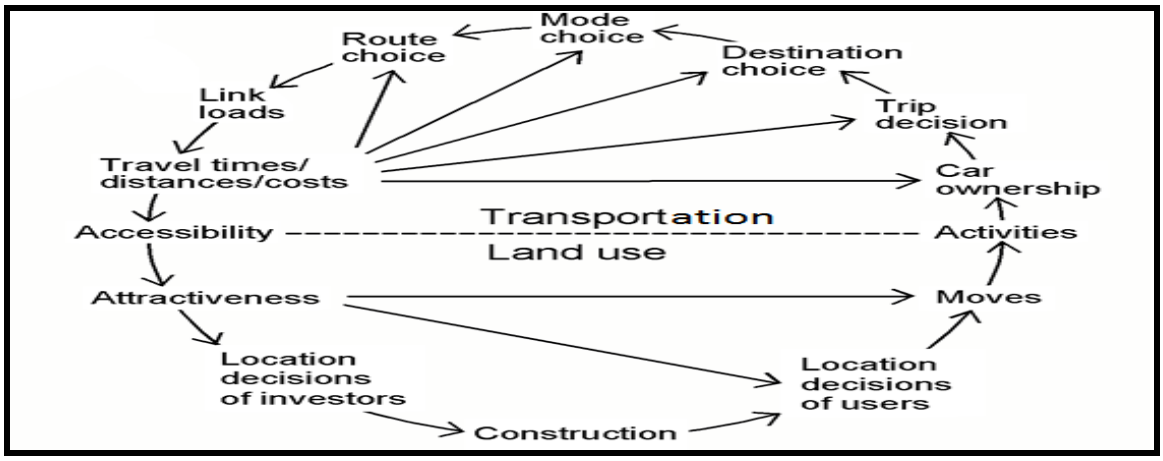

Figure 1: Linkage between land use and yransportation

(Source: Overview of land use transport models", by Michel Spiekermann)

II. LITERATURE REVIEW

The motivation behind trip generation model is to assess the objective year trip closes by travel reason for each movement zone inside the review range. It is the initial step of consecutive travel request demonstrating process. In this kind of demonstrating the volume of travel request that will be created in the plan year or future evaluated. Likewise it is important to decide different arranging variable, for example, populace, work, vehicle enrollment and land utilize and transport component, for example, trip length, access to Central Business Districts (CBD), the length and recurrence of trip.

Two sorts of trip-generation examination are completed and these are trip creation and trip fascination.

- Trip Production: - is saved for trips created by private zones where these trips might be trip beginnings and goals.

- Trip Attraction: - is utilized to portray trips created by exercises at the non-home end of a locally situated trip, for example, business, retail administration, et cetera.

The principal action in travel-request determining is to recognize the different trip sorts critical to a specific transport-arranging study. The trip sorts considered in a specific zone rely on upon the sorts of transport-arranging issues to be settled. The main level of trip arrangement utilized typically is a general gathering into locally established and non-locally established trips.

- Home-based Trips: - are those trips that have one trip end at a family. Cases adventure to work, shop, and school and so on.
- Non-locally situated trips: - are trips amongst work and shop and business trips between two spots of business.

Trip arrangement that have been utilized as a part of the real transport-arranging considers for locally established trips are:

a. Work trips
b. School trips
c. Shopping trips
d. Personnel business trips, and
e. Social-recreational trips

III. DATA COLLECTION ON SOCIO ECONOMIC CHARACTERISTICS

A. Study area details

The Surat city is divided in seven zones. East zone of the Surat city is selected for the study. The location of the east zone is show in figure 2**.** These east zone is further sub divided in 14 census ward. Data of travel characteristics are collected by home interview survey. Home interview survey is carried out within this 14 census ward. The population of east zone of Surat city is 11, 38,809 and Number of household in this zone is 3,13,105 according to census 2011. This zone have highest population as well as number of household other seven zone of the Surat city. The area of this zone is 37.525 km2. Also density of this zone is 303.03 per Ha.

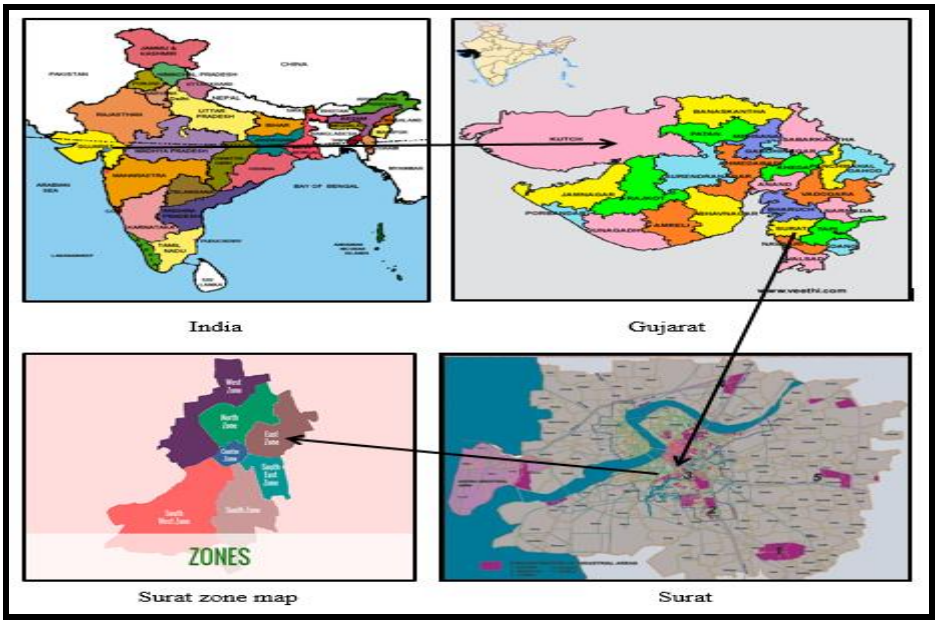

Figure 2: Location of east zone, Surat

B. Details of data collected from household survey

The home interview survey is completed to gather data about the family unit. For a family unit survey, it is prescribed that the survey be isolated into two sections as takes after and talked about beneath.

- Section 1: Household Characteristics and Identification:-

In this part incorporate question intended to order the family unit individuals as indicated by their connection to the head of family (e.g. spouse or child), sex, and age, ownership of a driving permit, training level and occupation. Keeping in mind the end goal to diminish the likelihood of a subjective characterization, it is essential to characterize an entire arrangement of occupations. This part likewise incorporates address intended to acquire financial information about the family unit, for example, attributes of the house, distinguishing proof of the family vehicles, house proprietorship and family.

- Section 2: Trip Data

This piece of survey goes for distinguishing and portraying all trips made by the family part's recognizable proof in the initial segment. A trip is characterized as any development outside a building or start with a given reason; however the data looked for considers trips by stages, where a phase is characterized by a change of mode. Each stage is portrayed on the premise of variable, for example, source and goal reason, begin and closure times, mode utilized, measure of cash paid for the trip et cetera.

Sample size is calculated by statistical formulas. According to this formula, the sample size is derived 1535 household sample. So finally sample size for home interview survey is 1535 household.

IV. DATA ANALYSIS AND RESULT

Table 1 lists descriptive for the total daily household trips. There has been a total of 10086 trips made by 1543 household.

Table 1: Descriptive data for the total daily household trips

Total Trip	Mean	Standard Deviation	Maximum	Minimum	Range
10086.14	6.54	1.85	15.57	2.29	13.29

It is apparent from Table 1 that the average daily trips per household is around 7. The maximum number of daily trips per house hold is around 16 where's the minimum number is around 2.

The descriptive statistics for the daily household trips according to their purpose are shown in Table 2.

Table 2: Descriptive Data for the Daily Household Trips by Purpose

Trip Purpose	Total Trip	Mean	Standard Deviation	Maximum	Minimum	Range
Work	4495	2.91	1.19	6	0	6
Education	3175	2.06	1.60	6	0	6
Shopping	1490.43	0.97	0.21	1.86	0.43	1.43
Recreational	518.29	0.34	0.21	1.43	0	1.43
Social	273.43	0.18	0.10	0.71	0	0.71
Other	134.00	0.09	0.10	0.57	0	0.57

Classification of trips according to their purpose is important to be carried out since make the trips for various reasons. In this research, among 10086 trips generated by 1543 household. Work trips account for 45% of total trip generated. The distribution of household trips according is shown in Table 11. The same data are shown graphically in Figure 3.

Table 3: Distribution of Daily Household Trips by Purpose

Trip Purpose	Number of Trip	%
Work	4495	45%
Education	3175	31%
Shopping	1490.43	15%
Recreational	518.29	5%
Social	273.43	3%
Other	134.00	1%
Total	**10086.14**	**100%**

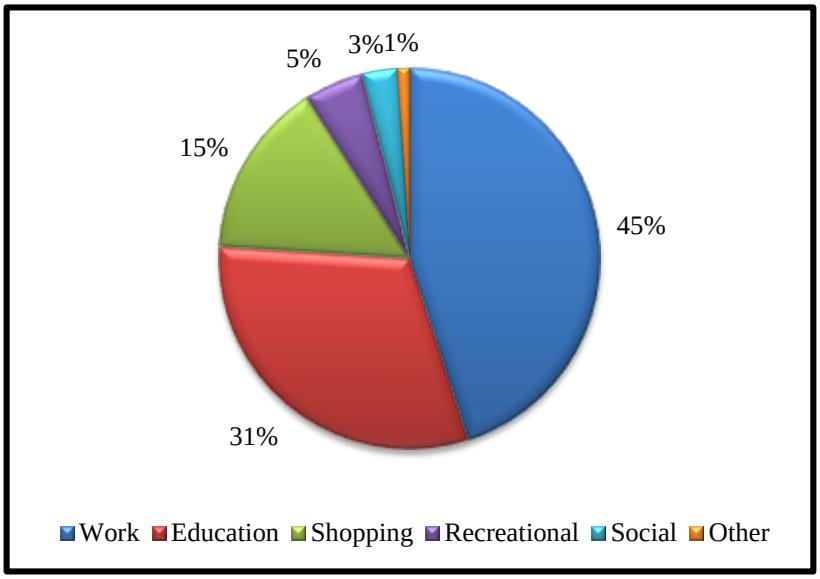

Figure 3: Distribution of Daily Household Trips by Purpose

V. CONCLUSION

Trip generation is the first step of the four stage travel modeling process. It involves the estimation of the total number of trips entering or leaving a parcel of land per time period as a function of the socioeconomic and land use characteristics of the parcel.

The average trip generated in the east zone of Surat city is 6.5 per household. The most of trip is generated related to work trip. According to this survey, Work trip is generated 45% of total trips in the east zone of Surat. The second highest trips is generated related to education trip that is 31% of total trip. The shopping, recreational, social and other trips is generated respectively 15%, 5%, 3% and 1% of total trip. Proper mass transportation system is required to control the trip generated in that area so motorized trip can be decreases.

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