



A STUDY OF MODAL SPLIT ANALYSIS ON NEW WEST ZONE OF AHMEDABAD CITY

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Abstract- Transport situation in most Ahmedabad cities is rapidly deteriorating because of the increasing travel demand and inadequate transportation system. Indian cities of all sizes are facing the crisis of urban transport. Despite investments in road infrastructure and plans for land use and transport development, problems of congestion, accidents and pollution are continuously increasing. Industrialization and rapid urbanization is leading people to migrate towards cities resulting in increase of travel demand in the urban areas. The existing inefficient transport systems are encouraging people to use personal vehicles which in turn increase the share of private mode of transport, declining public transport share causing various traffic problems.. Public transport plays a major role in reducing traffic problems in urban and has become a major issue in most metropolitan and urban areas in sought of resolving various transport problems. Efficient transport policies and strategies are required for the proper development of a city considering all the aspects of transportation. Planning of efficient public transport policies to provide seamless travel is needed for attracting travellers towards public transport to develop sustainable cities with reduced use of private vehicles and therefore there is need for understanding the behaviour of travellers to frame the policies. The behaviour of people in the study area towards public transport is analysed by conducting revealed as well as stated preference survey. Two Type of survey are taken house hold survey and corodon line survey and also use logit and regression model and transcade software for better understand model split analysis.

Keywords- Travel behavior, Travel Demand, Mode choice modelling, Transportation planning

I. INTRODUCTION

Transport engineering is the application of technology and scientific principles to the planning, functional design, operation and management of facilities for any mode of transportation in order to provide for the safe, efficient, rapid, comfortable, convenient, economical, and environmentally compatible movement of people and goods. In transportation engineering Operations and management involve traffic engineering, so that vehicles move smoothly on the road or track. Older techniques include signs, signals, markings, and tolling. Newer technologies involve intelligent transportation systems, including advanced traveler information systems (such as variable message signs), advanced traffic control systems

Before doing transportation planning of any city, it is necessary to know the choice of mode that is used by the people of any particular area. Public transport modes make use of road space more efficiently than private transport, whereas public transport is having more flexibility and it is more convenient. So modal split analysis helps to decide the mode of travel as bus, car, auto, railway, etc. In modal split analysis the total number of trips is expressed such as fraction, ratio, or percentage.

Aim of the study

The main of this study is to develop a mode choice modal for work trips in new west zone of Ahmedabad city that can be used to simulate the behavior of individuals to wards motorized and non-motorized modes.

Objectives

1. To study the factors affecting mode choice and various types of mode choice models.
2. To develop the most suitable model for work trips in study area.

Need of study

1. To incorporate the designing of transport systems, by making use and understanding the travel behaviour of the residents of the study area, and thus it develops a system that can accommodate the travel demands for future.
2. To be identified that can be put into practice in order to attract a substantial number of car users to adopt public transport to fulfil their travelling needs.
3. To provide comfort and safety
4. To provide suitable mode of transportation for suitable income people or provide better way of travel

5. Divide the people in to public and private mode of transportation as per its living standard
6. To reduce congestion of vehicle

II. LITERATURE REVIEW

Naveen Eluru, Travel Mode Choice and Transit Route Choice Behavior in Montreal, The main study of this paper includes the effect of the performance of the public transportation system on the commuter travel mode and transit route choice. The multinomial logit model is used for the travel mode choice and mixed multinomial logit model is used for the transit route choice component. The detailed socio-demographic and residential location information is also collected for the same. This paper mainly concludes the reason behind the high use of the automobiles by individuals and corresponding factors to the same and to analyze the transit route choice decision. The travel mode choice results clearly highlight the part of travel time, number of transfers, walking time, and initial waiting time on the propensity to pick travel.

Marko Matulin, Different Approaches to the Modal Split Calculation in Urban Areas, In this paper order to cope with rapid growth of congestion levels in urban areas, it is necessary to improve performances of a traffic network which can be one of the basic tasks of transport planning. The development of new services such as Park & Ride systems, individualised public transport services as well as creation of transport plans (car-pool, car-share) can significantly reduce the number of individual vehicles entering the urban area, thus reducing congestion levels and improving traffic flow performances. In order to create those kinds of strategies, a set of indicators must be defined. Those indicators provide the basic overview of network performances. One of the most relevant indicators is the modal split indicator. This paper describes the relevance of the modal split as well as different approaches to the modal split calculation. For the purpose of the modal split calculation, a set of terms is also defined.

Dr. L.B Zala, Dr. T.A.Desai, Transportation Planning Models Review, The main objective of this paper is to present an overview of the travel demand modelling for transportation planning. Mainly there are four stages model that is trip generation, trip distribution, modal split and trip assignment. The choice of routes in the development of transportation planning depends upon certain parameters like journey time, distance, cost, comfort, and safety. The scope of study includes the literature review and logical arrangement of various models\ used in Urban Transportation Planning. Trip generation gives an idea about the total number of trips generated to and attracted from different zones in the study area. In trip distribution, growth factor modeling and in trip generation, regression methods can be used to predict the trips. Trip matrix can be used to represent the trip pattern of a study area. Growth factor methods and gravity model are used for computing the trip matrix. Transportation planning involves so many iterative techniques, and large road networks, which is not possible to solve manually. But the computer programmers are created readymade softwares available for solved the transportation planning problems. Trip assignment is the last phase of four stage transportation planning. Multipath route assignment technique seems to be the most realistic among all those techniques.

III. STUDY AREA AND METHODOLOGY

Study Area Profile

As explained earlier Ahmedabad city is one of the biggest cities in Gujarat as well as in India. It is also 4th fastest developing city of world as per Forbes magazine 2010. Ahmedabad city is mainly divided in six different zones which are 1) Central Zone 2) East Zone 3) South Zone 4) North Zone 5) West Zone 6) New West Zone. There are mainly two public transport systems exists in Ahmedabad which are Ahmedabad municipal transport service (AMTS) and Bus rapid transit system (BRTS). The mass transit metro system, MEGA for the cities of Ahmedabad and Gandhinagar is under construction since March 2015. The North South and East West corridors are expected to complete by 2019. [8] Here the table is shown for the ward wise population data.

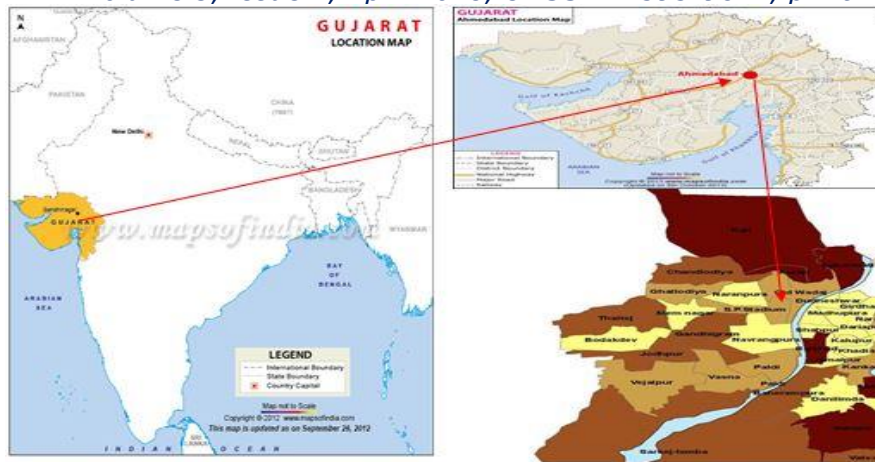


Fig-1: Study Area

Methodology

The Methodology is the technique that frameworks the path in which the research is to be embraced and recognizes the strategies to be utilized as a part of. Section 3.2 presents the sorts of travel studies and quickly depicts the home interview survey. Section 3.3 illustrates the detailed procedure of methodology and how the particular outcomes to be ascertained for the present review alongside a flowchart appeared in Figure 2 underneath.

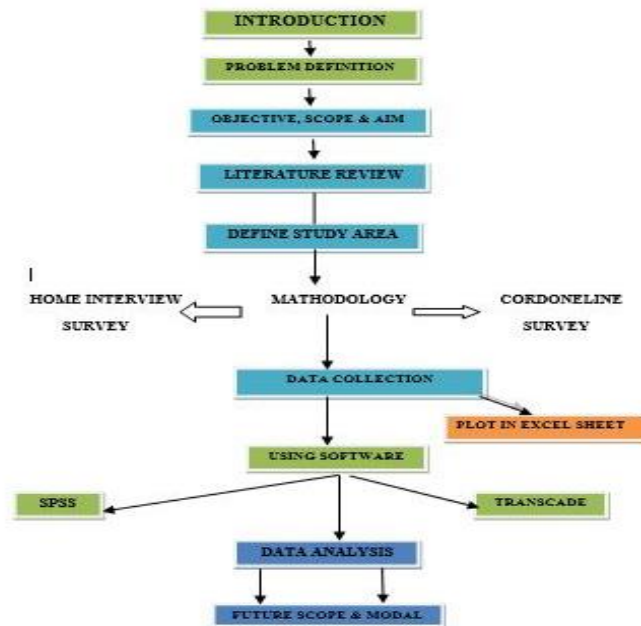


Fig-2: Flow Chart of Methodology

IV. DATA COLLECTION

As we discuss earlier Ahmedabad is biggest city of Gujarat and most development city which is consist two main public transportation which are Ahmedabad municipal transport service (AMTS) and bus rapid transit system (BRTS) which is covered whole Ahmedabad city . Ahmedabad city are divided in six zone which are 1) south zone 2) west zone 3) new west zone 4) east zone 5) central zone and 6) north zone and mass transit system METRO rail is under construction which is connect Ahmedabad and Gandhinagar. The population of Ahmedabad in different zones are following below

Table-1 Population in new west zone

Name of ward	Ward no.	Total no. of household	Total population
Sarkhej	33	32618	165478
Bodakdev	19	29298	149875
Thaltej	8	22749	115875
Maktampura	34	25576	136276
Jodhpur	20	22968	112346
Ghatlodia	7	51778	257267
Chandlodia	2	33698	165237
Vejalpur	32	67689	334562
Gota	1	37852	187235
	Total	324226	1624151

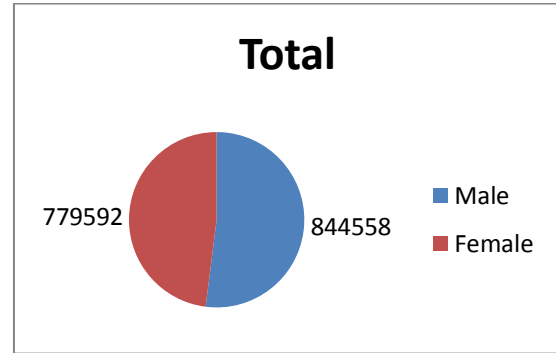


Fig-3: graph male and female ratio new west zone

Income distribution

Income of people is directly affect the number of trips and other factors like mode of travel, no of trips, travel cost etc. High income people more trip generate then low income people and also high income people living in high standard they are usually used private cars & bike for travelling and also choose mode which is has more cost.

Table 2: income distribution as per data collection

Group of Income(Rs)	Frequency	Percentage (%)
0 to 10,000	504	27.88
10,001 – 15,000	267	13.34
15,001 – 20,000	306	15.29
20,001 – 25,000	210	10.79
25,001 – 30,000	228	11.39
30,000 – 35,000	140	5.24
35,001 – 40,000	120	4.49
40,001 – 45,000	80	3.74
45,001 – 60,000	46	7.76

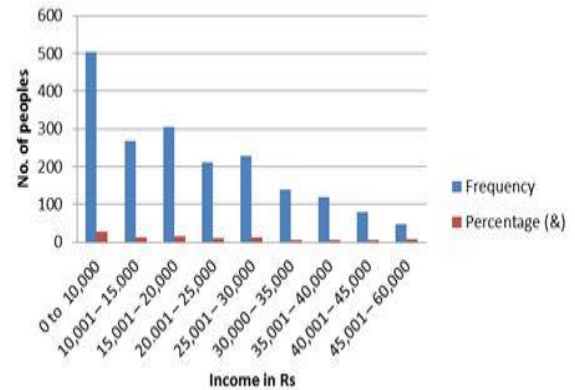


Fig 4: Income distribution

Different type of vehicles used in different ward

Different mode of transportation are used for trips in new west zone mostly two wheelers vehicles are using for their daily trips and like two wheelers vehicles for travelling for short distance trips shown figure and graphical representation shown below table.

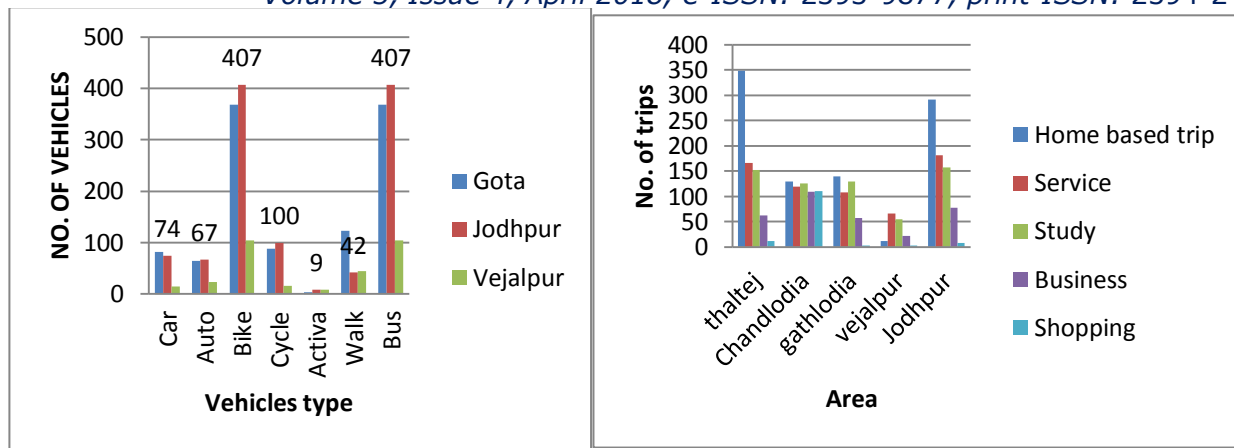


Fig.5 trips by different mode of transportation

Summary

Data collected by means of household survey providing information about the socio-economic character and their travel behaviour of a population, offers an important source of information for transport planning application. In next chapter mathematical model is developed for the above analyzed data.

V. DATA ANALYSIS

Existing Use of Public Transport

The city bus and auto - rickshaws are the existing public transports for Ahmedabad City. The use of bus and auto-rickshaws for work, education and other trips are shown in Figure below the chart reflects that use of public transport for other trips have high percentage followed by educational trips, whereas for work trips the use of public transport are less

Mode Share for Work Trips

The mode share observations for the three major income groups LIG, MIG and HIG are as shown in Figure, where in the maximum number of work trips are found to be commuted by two-wheeler for MIG and HIG and it is highest by Auto-rickshaw mode for LIG. The share of non-motorized modes such as walking and bicycle are very less. Very poor share is in city bus service.

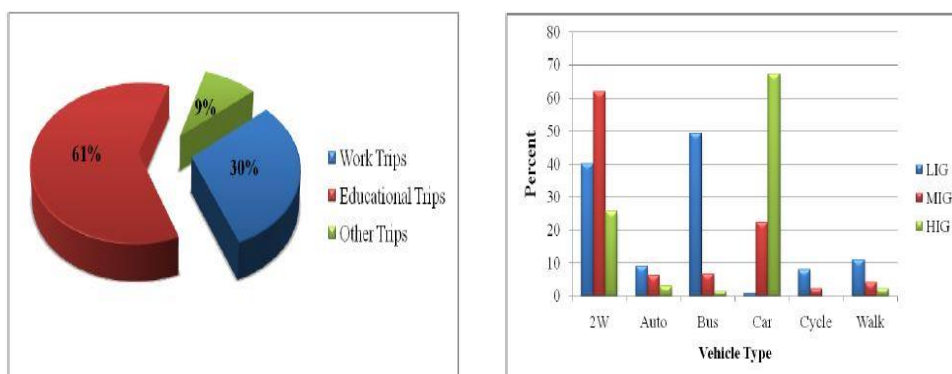


Fig 6: Existing Use of Public Transport and Mode share

VI. CONCLUSIONS

1. Based on the descriptive analysis of the collected data the travel time, travel cost, gender, age, monthly income, and frequency are considered the most important factors that affects the mode choice of trip commuters.
2. Based on above data analysis and using this data we can develop the modal for modal split analysis of new west zone of Ahmedabad

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