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Generation of O-D Matrix using TransCAD Software-West Ahmedabad

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Abstract—Urbanization is a dominant process in the growth of nation's economy, Ahmedabad city is well connected by an expressway, several national and state highways. Ahmedabad city is the centre for social, educational, commercial, residential, cultural, political and economic activities. Ahmedabad is a 7th largest metropolitan city in India. AHMEDABAD city is the administrative centre of Gujarat. Due to the continuing expansion of cities with the development of societies and technology through the ages make the existing transportation systems are not sufficient to meet the increasing demands due to the difficulty and the complexity of the daily movements of people and goods. Traffic congestion is major problem for smooth flow of vehicles in city transportation network. The annual growth rate of the vehicular population of Gujarat is even higher than the national growth rate because the state economy has been continuously doing better than many other states for the past many decades. With increasing in number of vehicles due to increasing of population in the city it may increase traffic problems, number of accidents, pedestrian safety, more fuel consumption, Air pollution etc. AMTS caters to 2.5 lakh trips every day. About 150 routes are in operation with a fleet size of 540 buses. The scope of the study includes the literature review and Gravity model calibration used in Trip Distribution. As the database is essential part in decision making. At the time of formation of the state of Gujarat, in 1961, there were only 43000 vehicles registered. This figure has risen to over 70 Lakh vehicles by the year 2004, The study will become base line study. The area to be covered in the study of above transportation problem should be West zone of AHMEDABAD and its surrounding urban areas. The area is to divided into 9 zones based on ward boundaries. In this study mainly O-D Matrix has to be generate. This paper consists up to O-D Matrix. Household survey is done of 1282 Homes.

Keywords-component: O-D Matrix, Gravity model calibration, trip distribution, house hold survey.

I. INTRODUCTION

Transportation planning is the process of defining future policies, goals, investments and designs to prepare for future needs to move people and goods to destinations.. An efficient transportation network is necessary for healthy economy of the country. Good transportation is a fundamental requirement for society to achieve a better quality of life. To meet the demand of 21st century, transportation links need to be efficient, fast, people friendly and sensitive to the environment.

There are eight bridges, which make it possible to traverse east-west across the river Sabarmati. There are two additional bridges proposed of which one in the south is under construction. The problems of urban facility have increased in manifold proportions due to the rapid growth of population and economic activities in urban areas of Gujarat. AHMEDABAD city is the administrative centre of Gujarat. Use of Gravity Model Calibration in trip distribution will help us to know the future traffic condition. And according to that we can plane the transportation system such that it allows smooth flow to vehicle, reduce the delay time and safety to pedestrian.

II. STUDY AREA

West Ahmedabad is separated from the other parts of the city by Sabarmati River. There are plenty of residential colonies located in this region. The place also boasts of housing some reputed colleges, which are world renowned. The region also flaunts good network of roads. Sardar Patel Stadium is housed here. This part of Ahmedabad is primarily a residential region with prominent educational institutes. Total area of West ahmedabad is 65.68 sqkm

- Navarangapura is a locality in Ahmedabad which houses various government offices like office of Tourism Corporation of Gujarat, High Court and Income Tax office.
- Sabarmati is a renowned place in northern part of Ahmedabad. Divided into two parts by National Highway No. 8A
- New wadaj is connected to other corners of the city by Vadaj Low Level Bridge. Ashram road and Dr. Chinubhai Patel Road are major connecting roads here. The airport is located at a distance of 25 kilometer from new wadaj.

- Naranpura is one of the oldest areas in the city. It is a residential locality. A railway line passes by this place to form its boundary.

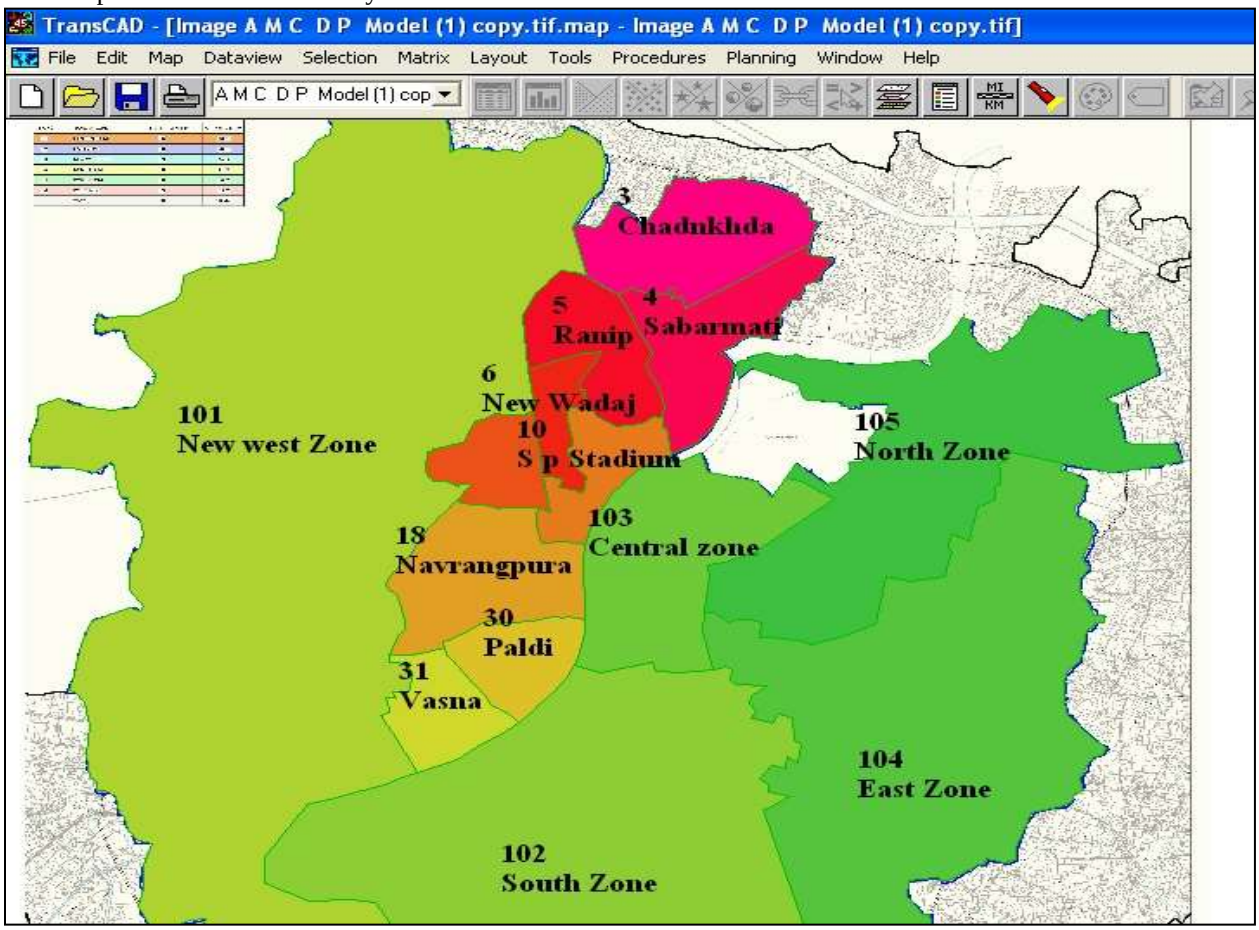

Figure 1. Ahmedabad Ward boundary Map (Using TransCAD Software)

III. NEED OF THE STUDY

The Western part of the city has developed as a mainly residential area and the eastern part has the industrial estates. Because of this, the traffic flow is very heavy from west to east in the mornings and vice-versa in the evening, which causes serious traffic congestion and frequent traffic jams on the city roads during morning and evening peak periods.

In ahmedabad of every 100 amdavadis only 15 to 18 go for the existing public transport system, namely, rickshaw, old buses of ahmedabad municipal transport services. currently two mass transportation system is working now in west ahmedabad AMTS and BRTS, these two system will be not sufficient in nearby future, The rest rely on their personal two- and four-wheelers, far too many if you consider the ideal percentage of 55-60 per cent who should be using public transport mode in any city.

Also due to the continuing expansion of cities with the development of societies and technology through the ages make the existing transportation systems are not sufficient to meet the increasing demands. To provide the flow of traffic freely and safely from one place to another without encountering any congestion problem, it might be necessary to improve the existing transportation facilities or to provide new facilities. Also due to increasing number of vehicles around 10 to 15 per cent accidents took place on BRTS tracks

IV. STUDY APPROACH AND METHODOLOGY

Data collection is the process of gathering the required information for each selected unit in the survey. During data collection, members of the population – be they individuals or organizations – are located and contacted and their participation in the survey is sought. Designing the data collection survey for the transportation projects is not easy. It requires considerable experience, skill, and a sound understanding of the study area.

Information needed

Socio-economic data: Information regarding the socio-economic characteristics of the study area. Important ones include income, vehicle ownership, family size, etc. This information is essential in building trip generation and modal split models.

Travel surveys: Origin-destination travel survey at households and traffic data from cordon lines and screen lines (defined later). Former data include the number of trips made by each member of the household, the direction of travel, destination, the cost of the travel, etc. The latter include the traffic flow, speed, and travel time measurements. These data will be used primarily for the calibration of the models, especially the trip distribution models Whole study area is divided in 9 zones.

Table 1 Zone names

Zone no.	Zone name	Area (Sq.Km.)
3	Chandkheda	11.9
9	Naranpura	4.91
18	Navarangpura	11.98
6	nava vadaj	3.17
30	Paldi	5.58
5	Ranip	7.55
4	Sabarmati	9.78
10	Sardar patel stadium	5.24
31	Vasna	5.57
	Total	65.68

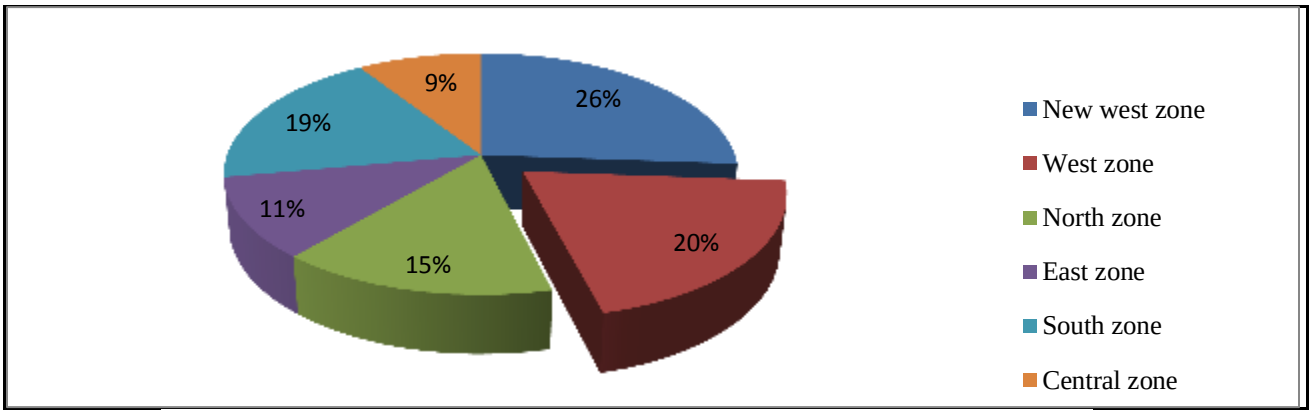

Figure-2 Population distribution of ahmedabad is according to given below pie chart

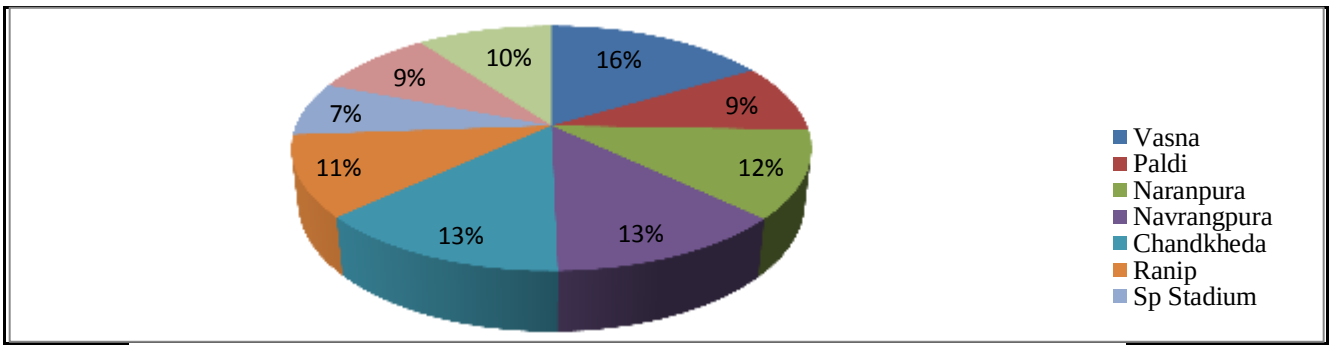

Figure-3 Population distribution of West Ahmedabad is according to given below pie chart

Using SPSS STATICS Software we got final O-D Matrix.

Origin * Destination Cross tabulation																
Count																
		Destination														
		3	4	5	6	9	10	18	30	31	101	102	103	104	105	Total
Origin	3	178	91	22	18	17	14	9	14	17	40	28	27	10	10	495
	4	88	137	38	23	28	36	25	23	25	58	29	55	12	3	580
	5	19	39	128	77	50	35	26	32	23	49	23	45	7	2	555
	6	19	24	80	141	56	28	34	20	29	54	36	37	12	4	574
	9	17	30	48	60	107	98	46	34	17	36	29	27	12	8	569
	10	14	36	34	26	98	127	64	53	33	31	30	43	28	15	632
	18	9	25	26	35	47	64	121	87	65	34	48	52	22	8	643
	30	14	24	32	20	34	50	88	125	100	19	47	59	34	18	664
	31	16	27	23	29	17	33	64	97	120	16	60	70	27	9	608
	101	40	57	50	54	36	28	33	21	16	0	0	0	0	0	335
	102	27	29	23	36	29	29	48	49	59	0	1	1	0	0	331
	103	27	56	44	38	27	45	51	58	70	0	0	2	0	0	418
	104	10	12	8	12	11	27	23	34	27	0	0	0	0	0	164
	105	9	3	2	4	8	15	8	18	10	0	0	0	0	0	77
Total		487	590	558	573	565	629	640	665	611	337	331	418	164	77	6645

V. CONCLUSION

Following conclusion are made from the above study-

1) 20% of total population living in west Ahmedabad.
2) 58% Male and 42% Female are living in west Ahmedabad according to our household survey of 1283 Homes.
3) Household survey has been taken in west zone of Ahmedabad of 6646 people.
4) GIS database of waste ahmedabad is prepared in TransCAD.
5) Using SPSS STATICS Software we got final O-D Matrix.

VI. ACKNOWLEDGEMENT

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