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# Literature review on Feasibility of Mass Transportation Facility in Dahod City

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Abstract— *Transportation system accessing jobs, education, recreation and similar activities is becoming increasingly time-consuming. Billions of man hours are lost with people "stuck in traffic". The primary reason for this has been the explosive growth in the number of motor vehicles, coupled with limitations on the amount of road space that can be provided. Transport crisis adversely affects human lives. Statistics indicate that traffic accidents are a primary cause of accidental deaths in the Indian cities. Further, the changes in urban form and structure in terms of land use, density of population and concentration of activities have changed the travel pattern. In other words, the traffic problems are increasing in the cities in general and the situation is becoming complex especially in core areas of the city. Bus transport is the most desirable and sustainable system from societal perspective. A well planned bus system can provide a high level of mobility to a large section of the population with least cost. However, a poorly planned system causes inconvenience to the users, loses ridership, encourages use of private vehicles and imposes financial burden on the operator.*

***Key words****; mass transit service, feasibility of public transportation system, urban transportation city bus service.*

## I. INTRODUCTION

Indian cities, of all sizes, face a crisis of urban transport. Despite investments in road infrastructure, and plans for land use and transport development, all cities faces the ever increasing problems of congestion, traffic accidents, air, and noise pollution. Large cities are facing a rapid growth of personal vehicles (two wheelers and cars) and in medium and small cities different forms of intermediate public transport provided by the informal sector are struggling to meet the mobility demands of city residents**.** Transportation demands in urban areas continue to increase rapidly as a result of both population growth and changes in travel patterns. In the era of environment concerns and limited space available in cities, transport planners have to provide a system, which can ensure safe and clean mobility to all city residents. This requires planning a system, which is affordable, reliable and efficient from the users' as well as operator's perspectives.

## II. PROBLEM STATEMENT

Traffic congestion has been increasing in Dahod city due to use of more private vehicles on road as shown in fig 1.4. Due to lack of public transport facility people switch to private vehicles such as rickshaw, chakdas, two wheelers and car, Being selected in smart city mission as per norms the city should have a B.R.T.S kind of public transport but looking at the present situation it seems impossible in city where not even a city bus system is planned.

As education facility has been increasing in Dahod city every private school has its own private buses and van for pickup facility of their students, moreover students of colleges and government servants working in Government College, Seva sadan, Panchayat and district court usually travel by rickshaw, chakdas or their own private vehicles which also increase traffic problems in peak hours in Dahod city.

The pollution level of Dahod city is on curse due to more use of private vehicle so to reduce pollution and sustainable development, city bus is required The population of Dahod city is increasing rapidly, as population is growing requirement of city bus service is necessary.

## III. AIM OF THE STUDY

The main aim of the study is to plan mass urban transport facility for development of Dahod city which includes; a well planned city bus system can provide a high level of mobility to a large section of the population with least cost.

## IV. LITERATURE REVIEW

Desai and Vashi (2008) have studied present trend of intra-city transportation system of Vadodara city, to evaluate performance of existing Gujarat State Road Transport Corporation (GSRTC) bus service and to evaluate the present public transport system in terms of passenger demand Moreover, it has been taken to study modal split and then prepare and suggest optimization of bus fleet so as to satisfy the needs of Vadodara city commuters and to make the bus service a profitable business. Various data were collected from different sources to study the existing intra-city GSRTC bus services and for preparation of digitized and geo-referenced maps using GIS software Arc. This is done for the further analysis so as to reach at reasonable conclusions. Breakeven analysis has also been performed so as to find out bus fleet for no profit, no loss business.

For further analysis, the O.D matrices have been prepared and new zone system has been proposed. The financial analysis viz. (1) Financial performance for present S.T bus service provided by GSRTC; (2) Financial analysis for "Ideal" condition as per proposed privatization model; (3) Financial analysis for "Optimized" condition as per proposed privatization model have also been proposed. After studying this, the model for privatization is suggested for implementation and also guidelines for implementation have been proposed.

Tiwari (2010) has studied about public transit systems pose a strong appeal to transportation engineers because they contribute less pollution and congestion, and provide an egalitarian solution to the mobility needs of a city. Promoting public transport as a choice mode is a requirement to meet the future mobility demand. This has to be achieved in the context of high ownership o motorized two wheelers, presence of informal sector in urban areas and high residential density of slum population in Indian cities.

Urban transport and urbanization are closely interlinked. Therefore planning for urban transport starts at understanding the urbanization process. India is only 30% urbanized at present, however, is expected to double its urban population in next twenty years. An important characteristic of Indian urbanization has been growth of informal sector as an integral part of urban system. If public transport has to become competitive as a choice mode, it must be designed as a system not merely introducing bigger vehicles (buses) or rail technology. The system components include infrastructure design, traffic operational strategies, vehicle design, institutional structure and financial model designed to meet the specific requirement of public transport uses and operators.

Electricwala, Kumar (2014) has studied One of the major thrusts of the Bus Rapid Transit System is to reduce the commuter's dependency on private vehicles and increase the shares of public transport to make urban transportation system environmentally sustainable. In this study, commuter mode choice analysis is performed that examines behavioral responses to the proposed Bus Rapid Transit System (BRTS) in Surat, with estimation of the probable shift from private mode to public mode. Further, evaluation of the BRTS scenarios, using Surat's transportation ecological footprint was done. A multimodal simulation model was developed in Biogeme environment to explicitly consider private users behaviors and non-linear environmental impact. The data of the different factors (variables) and its impact that might cause modal shift of private mode users to proposed BRTS were collected through home-interview survey using revealed and stated preference approach. A multi modal logit model of mode-choice was then calibrated using the collected data and validated using proposed sample. From this study, a set of perception factors, with reliable and predictable data base, to explain the variation in modal shift behavior and their impact on Surat's ecological environment has been identified. A case study of the proposed BRTS connecting the Surat Industrial Hub to the coastal area is provided to illustrate the approach.

## V. METHODOLOGY

The methodology of work is part of that planning phase. It covers the whole work which is going to be carried out for the completion of thesis. The first step in methodology is to identify the problem; it covers the subject of work. The next is literature review, in this step the previous year's works on that subject are collected and has been studied carefully. The third step is to select study area for implementing thought of work and it should be suitable for objective. After the selection of study area the objective of work should be decided. For achieving that goal, the data collection and data analysis results some remedial measure for road safety is going to be suggested. Last step is to give conclusion of this whole work done.

### 5.1 Home Interview Survey

A random sample of 3.5% percent of the population it selected and the residence are visited by me who collect the travel data from each member of the house hold. The data may be collected useful either for planning the road network and other roadway facilities for the vehicular traffic for planning the mass transportation requirements of the passengers. The problem of stopping vehicles and consequent difficulties are avoided altogether. The present travel needs are clearly known and the analysis is also simple. Additional data including socio economic and other details may be collected so as be useful for forecasting traffic and transportation growth. But to have complete coverage of the entire cross section of

the population is very tedious. While planning for O and D studies at a place it is necessary to decide the method of study.

### 5.2 Roadside Interviews Study

The vehicles are stopped at previously decided interview station by a group of persons and the answer to prescribe questionnaire are collected on the stop the information collected include the place and time of origin and destination, route, location of stoppages the purpose of the trip type of vehicle and number of passengers in each vehicle.

In this method the data is collected quickly in short duration and the field organization is sample and the team can be trained quickly. The main drawback of the method is that the vehicular movement. Also resentment is likely from road users. Further, unless is enough space, undue congestion may result due to stopped vehicles.

## VI. DATA ANALYSIS

After data collection from home interview survey, Origin Destination matrix will be generated from that Travel demand can be identified for different zones. Desire line diagram will have obtained from O-D matrix. Desire diagram will be generated using Trans-cad software.

## VII. STUDY AREA

The study area taken for the research work is Dahod city. Dahod, on the banks of river Dudhimati, is a small city in Dahod District in the State of Gujarat, India. The city serves as District Headquarters for Dahod District. It is approximately 200 km away from Ahmedabad and 150 km away from Vadodara. It is also known as Dohad (meaning "two boundaries", as the borders of the states of Rajasthan and Madhya Pradesh are nearby).

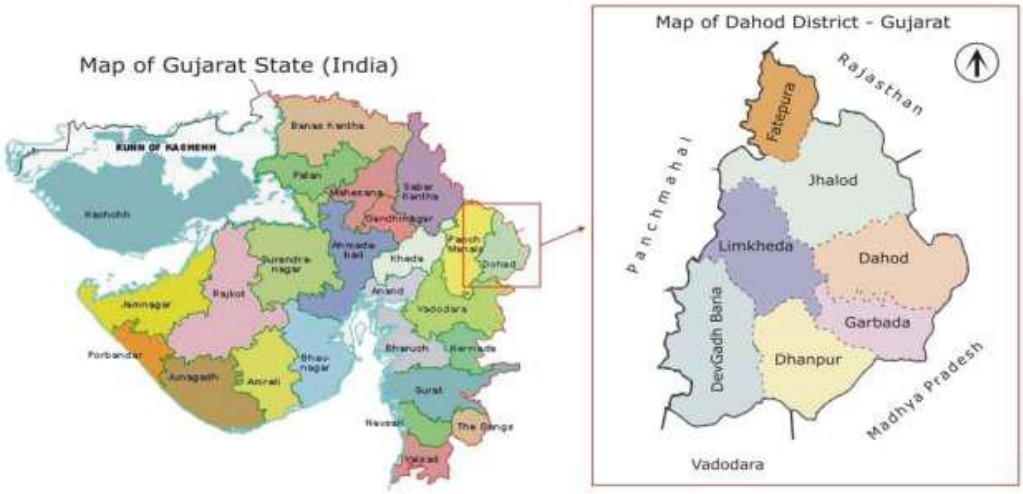
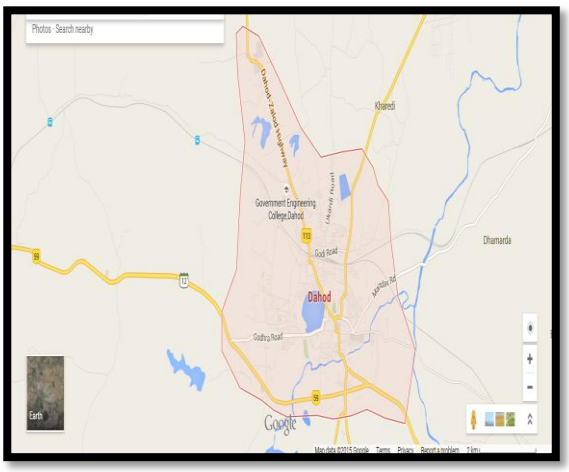



***Figure 1. Location of Dahod in the Gujarat***




***Location of study area***

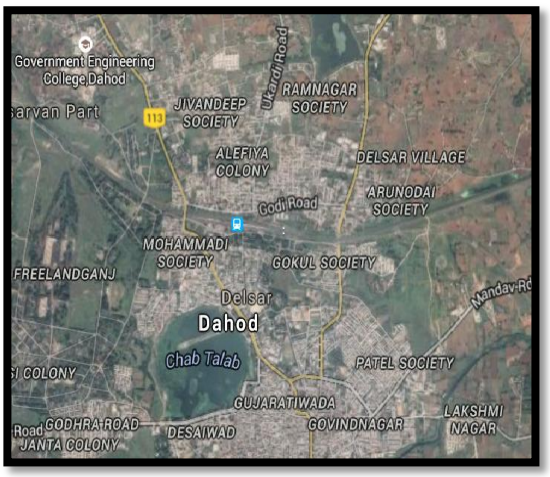



***Figure 2. Figure 3. Sattelite view of dahod city***

***Table 1. Connectivity of different cities from Dahod***

| Connectivity | Road (km) | Rail (km) | Air |
|---|---|---|---|
| Gandhinagar | 222 | 271 | Nearest Airport is Vadodara |
| Ahmedabad | 204 | 248 | |
| Vadodara | 150 | 148 | |
| Surat | 300 | 277 | |
| Indore | 201 | 289 | |
| Anand | 153 | 182 | |

***Table 2. Population of Dahod city***

| Year | Male | Female | Other | Total |
|---|---|---|---|---|
| 1991 | 34250 | 32250 | - | 66500 |
| 2001 | 40724 | 38414 | - | 79139 |
| 2011 | 48102 | 46240 | 4 | 94350 |

## VIII. DATA ANALYSIS

The o-d matrix is generated from home interview survey. In survey question were asked about their trip origin and trip destination so the trips which were within the zones were calculated. The origin and destination of trips from one zone to other zone is calculated. For example a trip moving from zone 1 to zone 3, its origin is 1 so it will be calculated zone 1 and the destination of the trip is zone 3 so the return trip will be calculated in zone 3.so like this other trips were also calculated for each zones. The value given in the cell is showing percentage of trips per day. Table 3 shows the calculated O-D matrix.

***Table 3. Origin and destination matrix***

| O-D | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| **1** | 48 | 88 | 142 | 35 | 129 | 84 | 102 | 65 | 66 | 759 |
| **2** | 88 | 35 | 77 | 59 | 118 | 85 | 96 | 39 | 33 | 630 |
| **3** | 142 | 77 | 71 | 100 | 125 | 95 | 75 | 80 | 74 | 839 |
| **4** | 35 | 59 | 100 | 36 | 103 | 102 | 94 | 61 | 43 | 633 |
| **5** | 129 | 118 | 125 | 103 | 46 | 160 | 102 | 75 | 99 | 957 |
| **6** | 84 | 85 | 95 | 102 | 160 | 38 | 119 | 38 | 40 | 761 |
| **7** | 102 | 96 | 75 | 94 | 102 | 119 | 42 | 88 | 88 | 806 |
| **8** | 65 | 39 | 80 | 61 | 75 | 38 | 88 | 58 | 56 | 560 |
| **9** | 66 | 33 | 74 | 43 | 99 | 40 | 88 | 56 | 32 | 531 |
| **Total** | 759 | 630 | 839 | 633 | 957 | 761 | 806 | 560 | 531 | **6476** |

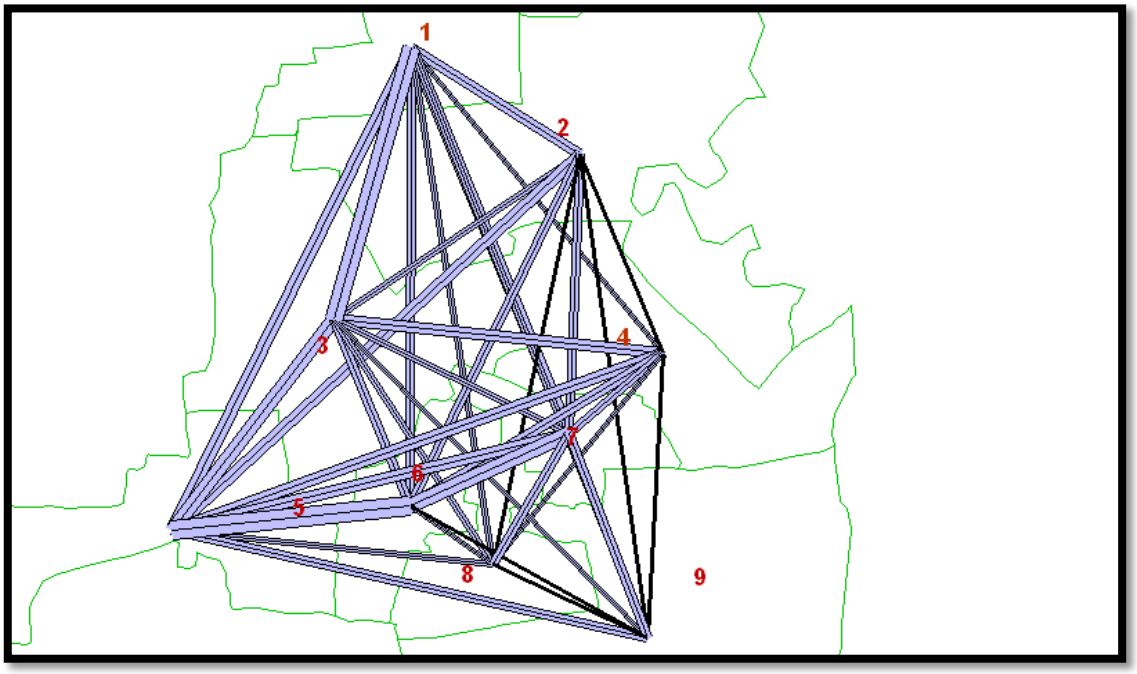


***Figure 4. Desire line diagram***

The desire line diagram shows the travel demand of the trips as the trips from zone 5 to zone 6 and zone 1 to zone 3 has the highest travel demand due trip attraction zone 3 which includes bus station, schools and shopping area.

**8.1 Vehicle ownership**

The total no of 2w in all 9 zones is 1288, 4w is 244 and other includes bicycle, auto rickshaw, LCV etc. which is 109 so that shows the no. of 2wheeler are increasing at high rate.

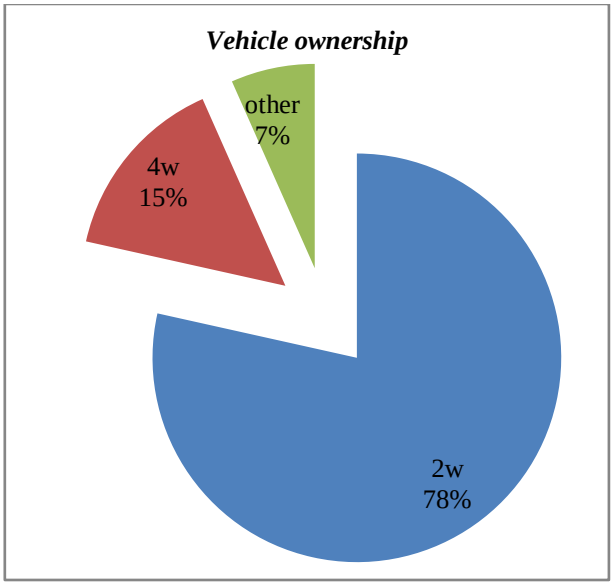



***Figure 5. Vehicle ownership of all zone as per sample collected***

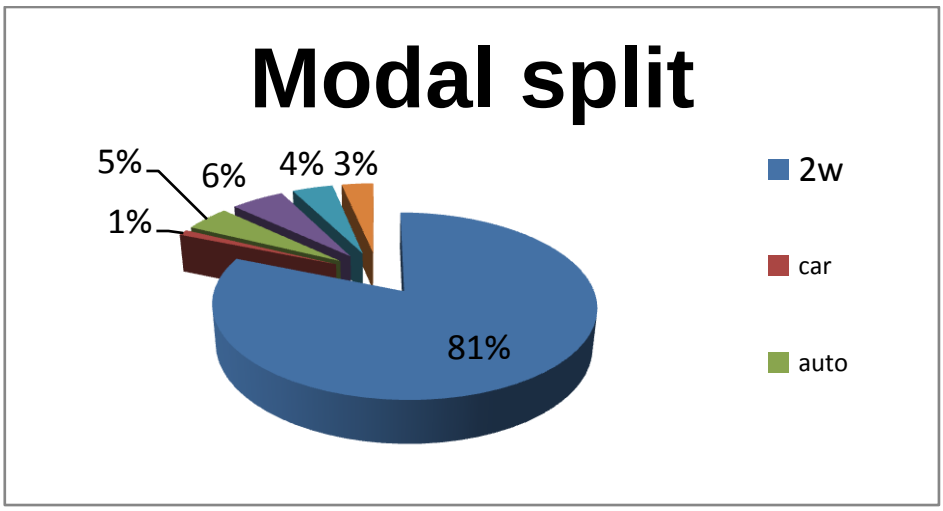



***Figure 6. Modal split of all zones as per sample collected***

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