

# Literature Review on Feasibility Study of City Bus Service in Godhra City

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**Abstract**— Urbanization, growth of cities, increase in population, transportation problems, congestion, accidents, delay, increase in number of vehicles, with extension of urban area trip length have also increased, travel demand increases. Thus it has become necessary to provide city bus service or urban mass transportation system. For growing towns which are growing rapidly and extended and are involved in urban area, thus it has been necessary to provide a convenient mode of transport which should be easy accessible and cheap. Thus, the study defines to study the feasibility, demand of public transportation system. The study area is Godhra city which comes under “A –Class” Municipality and the administrative headquarter of Panchmahal district in central Gujarat, India.

**Key words:** Urbanization, feasibility, city bus service or urban mass transportation service

## I. INTRODUCTION

Entering the 21<sup>st</sup> century, the Indian transportation system has been rapidly expanding; still it has not been able to keep pace with the congestion in our cities which continues to grow at an alarming rate. This increased congestion is adversely impacting our quality of life and increasing the potential for accident and long delay. Transportation is the backbone to the development of urban areas. It enables functioning of urban areas efficiently by providing access and mobility. Vehicles are major sources of urban air pollution and greenhouse gas emissions. Traffic, Transportation service, Mass Transportation, and Road network are key indicators to provide the image of city. Considering all these facts, Govt. of India has also emphasized in the National Urban Transport Policy on development of efficient Mass Transport system in urban area. The objective of this policy is to ensure safe, affordable, quick, comfortable, reliable and sustainable access for the growing number of city residents to jobs, education, recreation and such other needs within our cities.

## II. URBANIZATION

Urbanization can be defined as “as a process which reveals itself through temporal, spatial and sectorial changes in the demographic, social, economic, technological and environmental aspects of life in a given society”. It is long term continuous process.

Urbanization is a Progressive concentration of population in urban unit. India’s urban population is growing at an average rate of around 3 percent per annum. It has almost doubled during the period between 1981 and 2001 from 160 million to 285 million (Figure1).

The average rate of growth of the urban population is not expected to change significantly during the next twenty years. Assuming a decadal increase of around 37%, India’s urban population is expected to be around 540

million during 2021. In terms of percentage of total population, the urban population has gone up from 17% in 1951 to 29% in 2001 and is expected to increase up to around 37% by the year

Year	UrbanPopulation(in millions)
1951	62
1961	79
1971	109
1981	160
1991	217
2001	285
2011	377
2021(forecasted)	540

Table 1: Growth of India’s Population

The number of cities and the sizes of these cities have also increased considerably. The urbanization has different characteristics for different cities. Thus pattern of urbanization has great variation across the states. Transport is the main factor that contributes to this variation. There is a positive correlation between urbanization and economic development; therefore states having high urbanization level has high level of economic development. The distribution of urban population by city size widely varies and is skewed towards larger cities. One specific feature of India’s urbanization is the increasing metro-politization, that is, growth in the number and size of cities with a million plus population.

## III. AIM OF THE STUDY

The main aim of the study is to study the feasibility for providing a city bus service in Godhra city and design and plan the potential routes and scheduling of the bus service. So to decrease the transportation problem, traffic problems which are now in very much Godhra city day by day. Due to increasing population in limited area, traffic volume is increased. To avoid this problem city bus is necessary in Godhra city.

## IV. ROLE OF TRANSPORTATION

Without transportation systems, cities would never have developed. Once laid down, transportation systems stay they are bones that support a social and economic fabric.

Transportation to allowed people to get to places with natural advantages for population concentrations. It allows modern city to exploit the advantages of concentrations to more efficiently provide better goods and services, and to trade those goods and service with other places, which in turn allow for economic specialization and efficiencies.

Transportation in the Republic of India is an important part of India’s economy. Since the economic liberalization of the 1990s, development of infrastructure

within the country has progressed at a rapid pace, and today there is a wide variety of modes of transport by land, water and air. However, India's relatively low GNP per capita has meant that access to these modes of transport has not been uniform.

A mode of transport is a solution that makes use of a particular type of vehicle, infrastructure and operation. The transport of a person or of cargo may involve one mode or several of the modes, with the latter case being called intermodal or multimodal transport. Each mode has its own advantages and disadvantages, and will be chosen for a trip on the basis of cost, capability, and route.

## V. NECESSITY OF URBAN TRANSPORTATION PLANNING

Urban transportation is the most important component in shaping urban development and urban living. The test of urban governance depends upon the quality of life the city or town offers. Since transport is one of the prime determinants of quality of life, it is for the government to articulate the need for mobility and facilitate it through an appropriate mechanism. In fact, the efficiency of cities greatly depends on the development of transport systems, as urban transport is a catalyst for overall development. Much of the confusion in these matters is due to a lack of professional expertise.

## VI. IMPORTANCE OF PUBLIC TRANSPORT IN URBAN AREAS

In India urbanization is so fast and decentralized; therefore there is a great need of effective public transport in these urban areas or say CBDs (Central Business Districts). These CBDs are the main market areas and trips generated to these areas are so great in number, but due to lack of capacity of roads to accommodate these trips, an efficient public transportation system is required. Most Indian cities are expanding in a radial mode and are not likely to develop one concentrated high density business district in the foreseeable future. Most city plans include decentralization of many trade activities with relatively low-rise development.

The marginal cost of operating a motorized two-wheeled vehicle is about Rs. 0.70–1.0 per kilometer at 2005 prices. This determines the maximum fare box levels for public transport. It will be difficult to attract users to public transit systems if fares are set higher than this. If we assume that at least 30% of families in Indian cities earn less than Rs. 5,000 per month (2005 prices), then these families are not likely to spend more than Rs. 5.00 per trip on transport. Low income individuals are not likely to use public transit for short distances. Long distance trips on the metro would cost 3 to 4 times this amount. Therefore, metro transit is not likely to be affordable for a significant segment of Indian urban populations for some time to come. Most Indian cities have mixed land use patterns and we are not likely to succeed in implementing strict zoning for land use, even if it were desirable. This means that many citizens live close to work places and can walk, bicycle, use Para transit or buses quite conveniently.

## VII. IMPORTANCE OF BUS TRANSPORTATION

The growth of urban transport is unregulated. The percentage of total area occupied by roads in most of our

cities doesn't reflect the demand for the same and is prime importance in the movement of vehicles. The mix of different modes of transport such as animal drawn vehicles, cycle rickshaw, two wheelers, cars, buses etc. With their varying sizes and speeds create a lot of confusion and hinders smooth flow of traffic. This also leads to accident and congestion on the road. In recent years there has been a major growth of personalized vehicles and therefore private mode of transport is being widely adopted by the commuters. This will have an adverse effect on the roads by increasing the number of vehicles on the road which will ultimately lead to congestion.

## VIII. STUDY AREA

The study area is Godhra city located in Panchmahal District of Gujarat State, India. Godhra is one of the oldest district headquarters of Gujarat before Independence. It is located in the heart of central Gujarat. Godhra city is Tribal and minority dominated area and presently it is a Headquarter of Panchmahal District. Area within the limits of municipality of Godhra city is 20.33sqkms, but the study area will include all the nearby attracting center points with area of 150sqkms. The study area will include the nearby attracting points such as Panchamrut dairy, GEC Godhra, GP Godhra, Engineering College Tuwa, Ayurvedic hospital, Agriculture College and the villages within this main center point.

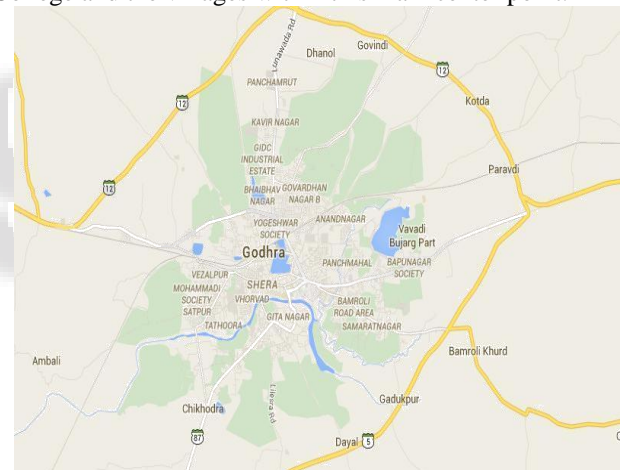


Fig. 1: location of Godhra

## IX. LITERATURE REVIEW

In the field of feasibility public mass transit system and routing and scheduling, various research and studies have been carried out. Some of them are as follow:-

### A. Introduction of Public Bus Transit in Indian Cities (2014):

Electricwala Fatima et al.(2014) studied to introduce public bus transit system in Indian cities raises many challenging issues of different nature ranging from technical to operational. The study examined the impact of a new public bus transit system by applying a binary logit analysis for assessing the possible variation in modal shift behavior. The case study of mode-choice was developed, calibrated, and validated using socio-economic data collected on six proposed corridors in the city of Bardoli, Gujarat, India. Traffic quality parameters, such as average speed, delay, congestion, travel time, and travel cost were modelled to

investigate the impact of the new bus transit system in VISSIM environment.

They showed that the probability of an overall modal shift to proposed bus transit system corridors ranges from 45% to 51%. The maximum modal shift ranges from 80.58% to 87.40% for three-wheelers (Para-transit) followed by bicycle and walking mode. However, cars have the least modal shift ranging from 6.78% to 11.49% and 37.38% to 45.46% for two-wheelers. The average speed of the bus transit system in both directions could reach 47.75–49.59 kmph with 15 min frequency. They also calculated mean travel time which was estimated from 1.3 to 1.6 min per km and average commuter cost of less than Rs. 1.0 per km for bus transit with insignificant delay and congestion. Introduction of the new public bus system shows promising results and has to play a significant role in developing a sustainable urban public transportation system.

Thus the findings can be used to form the basis for the implementation of the new public bus transit in peer cities with relatively similar sizes, which may impact an inhabitant sustainable choice on ridership in due course.

#### *B. Impact of New Public Transportation System in Nagpur City: A Review (May-June 2014):*

Narendra M.Hatwar et.al(2014) studied the impact of new public transportation system NPTS includes public transportation is the most efficient method to solve city transportation solution such as public traffic jam, simultaneously traffic incidents, traffic environment pollution and energy sources deficiency etc. They analyzed the complete demand of society, and government, passenger, driver and center of monitoring and management for designing a city bus in Nagpur city . City-bus control traffic system the evaluations of the travelling time at the connection stop are the main objective of the study. They conducted Preliminary survey to select suitable corridor .and then Developed possible Network for Public transportation corridors, Estimating Travel Cost (Vehicle operation Cost) using IRC: SP: 30-2009.

They further estimate travel time, Speed before and after introducing public transport in size city through simulation and IRC standards. Thus there Dissertation has investigated a new PT introduction in cities which lead to sustainable transport and reduce congestion problems in future. Thus the facilities shift from car traffic towards public transportation, which is safer, cleaner and produces less congestion.

#### *C. Use of Transcad in Bus Transit Planning: A Case Of Anand City (2014):*

Dharmin H Bhatt et.al (2014) studied that due to the increase in the private vehicles the cities are facing problems is terms of traffic congestion, accidents, increased travel time etc. Therefore it is very essential to provide effective public transport, i.e. bus transit. They evaluated the performance of VITCOS Bus service in the city of Anand, Gujarat, India. The study results are presented using GIS software, TransCAD.

The main objective of the study is to determine the existing characteristics of the bus service and to provide and optimize the route of the bus service. They calculated spatial and non spatial data and analysis is done. They concluded that Vitcos bus service was not running sufficiently

throughout the city. There are some areas where city bus is not there. So they suggested to provide city bus service in circular manner so that everyone can take the advantage of it.

#### *D. Study on Urban Transportation System for Surat City(2013):*

Bhavesh N Patel et.al(2013) they carry out the study of existing transportation facility in surat city, feasibility study for the mass transport users , as well as they evaluated modal share for the urban transportation. And then they concluded that only GSRTC bus system and private bus system is in operation but other modes of public transport like BRTS, LRT should be proposed, Bus mass transit routes proposed by SMC., Bus Mass Transit routes proposed with BRTS/LRTS along North-South and East-West corridors.

#### *E. Availability and Accessibility Assessment of Public Transit System in Jaipur City(2013):*

Vimal Gahlot et.al(2013) studied that the majority of the million plus cities in India are facing serious problems of traffic congestion and pollution due to the unprecedented and rapid pace of urbanization in last decade. In their study they estimated the public transit network availability and pedestrian accessibility for the city bus routes in Jaipur city. To assess the availability of public transit network on spatial basis, they used some numerical index using GIS tools, based on capacity, frequency and coverage as Public Transit Coverage Index (PTCI), similarly to measure the pedestrian accessibility numerical indices, as Ideal and Actual Stop Accessibility Index (ISAI and ASAI) and Stop Coverage Ratio Index (SCRI) has also been determined on GIS platform. These indices indicate the well served or underserved area by existing transit network and accessibility of a bus stop through the surrounding road network. The indices they analyzed may help urban transport planners to prioritize the development of future mass transit network and pedestrian road network around the stops to make system more attractive for choice riders and thus increase the public transit mode share in the city.

#### *F. Improvement in Transit Service using GIS – Case study of Bhavnagar State Transport Depot(2005):*

Mukti Advani et.al (2005) employed Geographical Information System (GIS) for integration of spatial and non-spatial data. A case study of Bhavnagar district area was conducted for determining the optimal routes from one origin to many destinations kind of problem, with an objective of minimizing travel distance and travel time of users. Constrains taken into consideration were impedance for intersections, type of road and speed. Length of 49 different routes obtained from GIS has been compared with the length data collected from S.T. Department of Bhavnagar. Out of 49 routes 45 routes are optimized and 4 routes such that the routes are having less length then the routes suggested by the GIS network too l. And they showed that the total travel distance and diesel consumption have reduced and thus Bhavnagar depo has saved lot of amount on fuel as well as on wear and tear.

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