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Economic Evaluation of Different Proposal of Highway Project: - A Case Study of Naroda Railway Crossing

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ABSTRACT - ***In the absence of insufficient, fast and reliable public transport system more and more people are shifting to personal vehicles in most of the cities, which results in massive growth of automobile population around the world. Due to fast growing private vehicular traffic and poor public transportation most of city corridors become congested. At that time we think about for LRT system, Metro trains, and BRTS system to divert this personalized traffic volume. For fast and safe movement of traffic fly over and over bridge is essential at Road-Road and Rail-Road intersection. Transportation is tool to transport goods and people from one place to another. An investment in highways of other facilities generates benefits in the form of lowering the transportation costs for movements. It also enhances the level of GDP through mobilization of unemployed factors of production. This helps for economic growth and development. Reduction in transportation costs can be realized in numerous ways, such as reduction in travel time, Decrease in VOC, increased safety and reduction in the level of air and noise pollution. But in the final analysis all benefits of road, and therefore the justification for constructing it, flow from using it for transportation. So it can be said that all the road investments should be "Need-Based" and be made only when they lower the transportation cost. It is enough to warrant their investment costs i.e. including the present value of future maintained. This analogy has to be viewed with future impact study of a proposed transportation projects. Now a day, the issue of identification, forecasting and measuring the impact due to implementation of many transportation projects is the central issue of concern in transportation planning. The big projects influence the neighbouring environment. It is not only important but essential to understand development impact of the proposed road project and to evaluate an appropriate strategy for implementation of its financial availability, economic evaluation is requiring. The scope of the present study consist of evaluating the impact on traffic, initial social and Environment screening and checking and financial viability of the project. For the case study construction of ROB at intersection of Nana Chiloda-Naroda Road with "Ahmedabad Udaipur M.G. line at Narodas Crossing L.C.No.9" is selected. There is a fixed delay for 2 hr. and 01minute duration in 24hr. due to gate closing. For the dispersion of the traffic, waiting in queue cause operational delay. The project has benefits like fuel saving, travel time saving. The project is evaluated by using very economic evaluation methods for viability of the project***

Keywords: *Platoon, Platoon dispersion, Platoon ratio, Passenger car unit, Congestion*

I. INTRODUCTION

A transportation system may be defined as consisting of the fixed facilities, the flow entities, and the control system that permits people and goods to overcome friction of geographical space efficiently in order to participate in a timely manner in some desired activity. It is a very awkward way of saying "To move from point A to point B"! This definition reveals the breadth of transportation engineering and delineates the purpose and scope of this introductory text. It identifies the functional components of a transportation system (i.e., the fixed facilities, the flow entities, and the control system) and encapsulates the fact that transportation provides the connectivity that facilitates other social interactions. Transportation is a movement of men and goods is as old as civilization Roads or highways are one form of the means of transporting men and materials from one place to another. Transportation is the critical underpinning upon which the industrial and technological complex of the nation is based. Transportation is the life-line of any country. Because in all walks of life without transportation the progress or development of any country is impossible. Transportation plays a very important role in economic and social development of the country. Fixed facilities of the physical components of the system that is fixed in space and constitute the network of links (e.g., roadway segments, railway track, and pipes) and nodes (e.g., intersections, interchanges, transit terminals, harbors, and airport) of the transportation system.

The control system consists of vehicular control and flow control. Vehicular control refers to the technological way in which individual vehicles are guided on the fixed facilities. Such control can be manual or automated. The proper geometric design of the fixed facilities must incorporate, in addition to characteristics of the vehicle, the characteristics of the vehicular control system. In the case of highway facilities, where the vehicles are manually controlled, these include driver characteristics, such as the time a driver takes to perceive and react to various stimuli. In the case of automated systems similar but more precisely definable response time exist as well. The flow control system consists of the means that permit the efficient and smooth operation of streams of vehicles and the reduction of conflicts between vehicles. This system includes various types of signing, marking, and signal systems and underlying rules of operation. Many transportation schemes result in time saving. For example, the replacement of road-rail level-crossing with an over bridge will result in free movement of the road traffic without getting hindered when the level-crossing gate is closed. This results in saving in time to the highway user. The construction of a flyover with grade separation in place of an existing signalized inter-section is another example where considerable reduction in travel time is possible to the highway user. Infrastructure sector, in particular transportation infrastructure in developing nations are facing several difficulties and challenges while constructing new flyovers/bridges or even expanding carriage ways over the existing network of roads. The most important challenge is to undertake the construction without disturbing or blocking the existing traffic. Such problems can be tackled by introducing new technologies and ECC. Bridges structures have been evolving throughout the history and this will continue in the future as well, perhaps at an accelerated pace. The driving force behind continued advances in bridge engineering depends to a large extent on traffic congestion and reducing costs. Needless to mention, safety and aesthetics will also continue to play a major role.

- Flyover
- Underpass

The specific objectives of this research were to

a) To study of construction cost ROB at study area location
b) To determine the Travel time saving.
c) To find out delay at crossing.
d) To carry out the Economic Analysis of ROB, Sensitivity Analysis and Determine the Benefits of ROB for the Particular Study.
e) To carry out the viability of the proposed study work.

II. LITERATURE REVIEW

New Delhi: After a delay of over four years, the Delhi Development Authority's (DDA) study work to build a six-lane road linking the Dwarka sub-city with south Delhi. Chennai: the state Government is considering to replace the existing railway underpass on Grand Northern Trunk Road at Vyasarpadi. Greenlands flyover: (By executive Engineer, specials Study works Division, B.N. Rajeshwar), under construction will not only help traffic from Begumpet jump over an extremely busy junction, but it will also help add to the carriageway of the existing flyover over the railway line.In India several studies were conducted based on accepted principles of economic analysis but the quantification of benefits was beset with difficulties in the absence of indigenous research. A traffic study of the railway level crossings Madras based on the man hour and vehicle hour cost at various level crossings. An assessment has been made for the financial losses to the community due to these delays. These delays were not backed by results of any research in India. (Muthukumar Swamy, A., thillainagam).The World Bank participated a major study in India, known as the Road User Cost Study. Formed jointly by the Govt. of India and the World Bank was implemented by the Central Road Research Institute and was completed in 1978-83. For the first time in India, the study employed the latest available instruments for data collection. A study of benefit cost analysis of proposed bridge over river Jamuna in Delhi reported by Sana etal has indicated the limitations for accurately forecasting benefits to users.

III. STUDY AREA

Ahmedabad, the premier city of the Gujarat state and the sixth largest metropolis of India, is bound by 23 00' N latitude and 72 00' E longitude. After the bifurcation of ex-bilingual Bombay state in May 1960, Ahmedabad was the capital of Gujarat, till it was shifted to Gandhinagar a newly constructed capital town at a distance of 24 km in the year 1970. Ahmedabad is now a district headquarters and many state- level and district-level offices are located in the city.The city is devoid of any major physical features, except River Sabarmati cutting the city in to two parts: Eastern City and Western Ahmedabad. Its midway location, with Rajputana and Malwa Plateau Region on one side and Saurashtra Peninsula and Bombay Metropolitan Region on outer side has resulted in its development as an important trade center. The city was once famous as the 'Manchester of India' on account of its textile industry.The city has witnessed a manifold increase in terms of area as well as population over years. As per 2001 census, there are 3.51 million people residing over an area of 190.84 Sq. km. The city is administratively divided in to 43 yards and 5 zones: North, East, South, West and Central.

Figure 1. Traffic Problem at Naroda Crossing

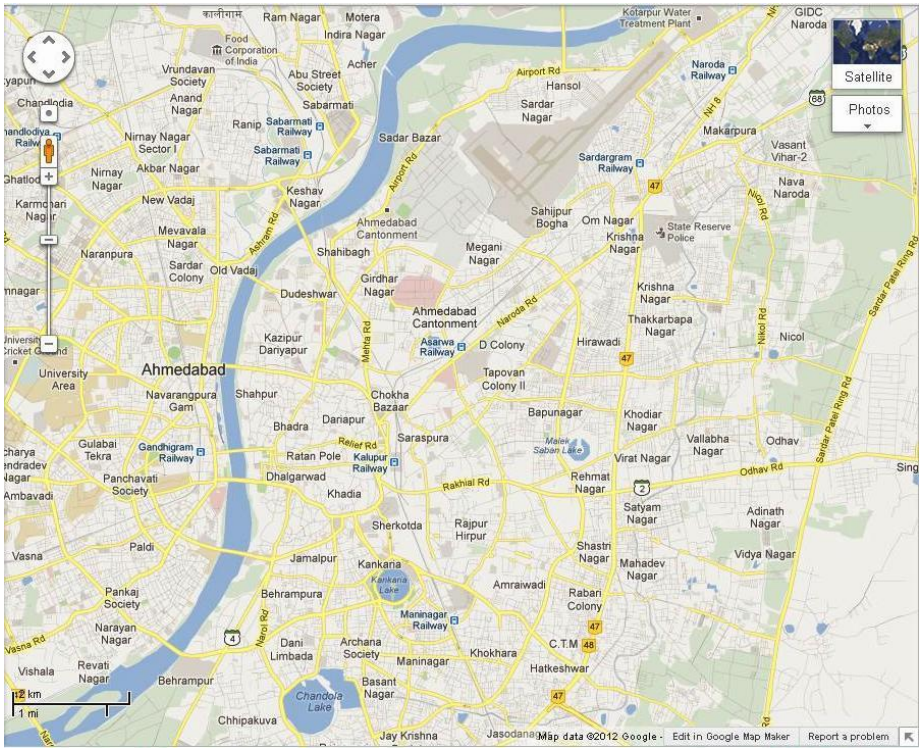
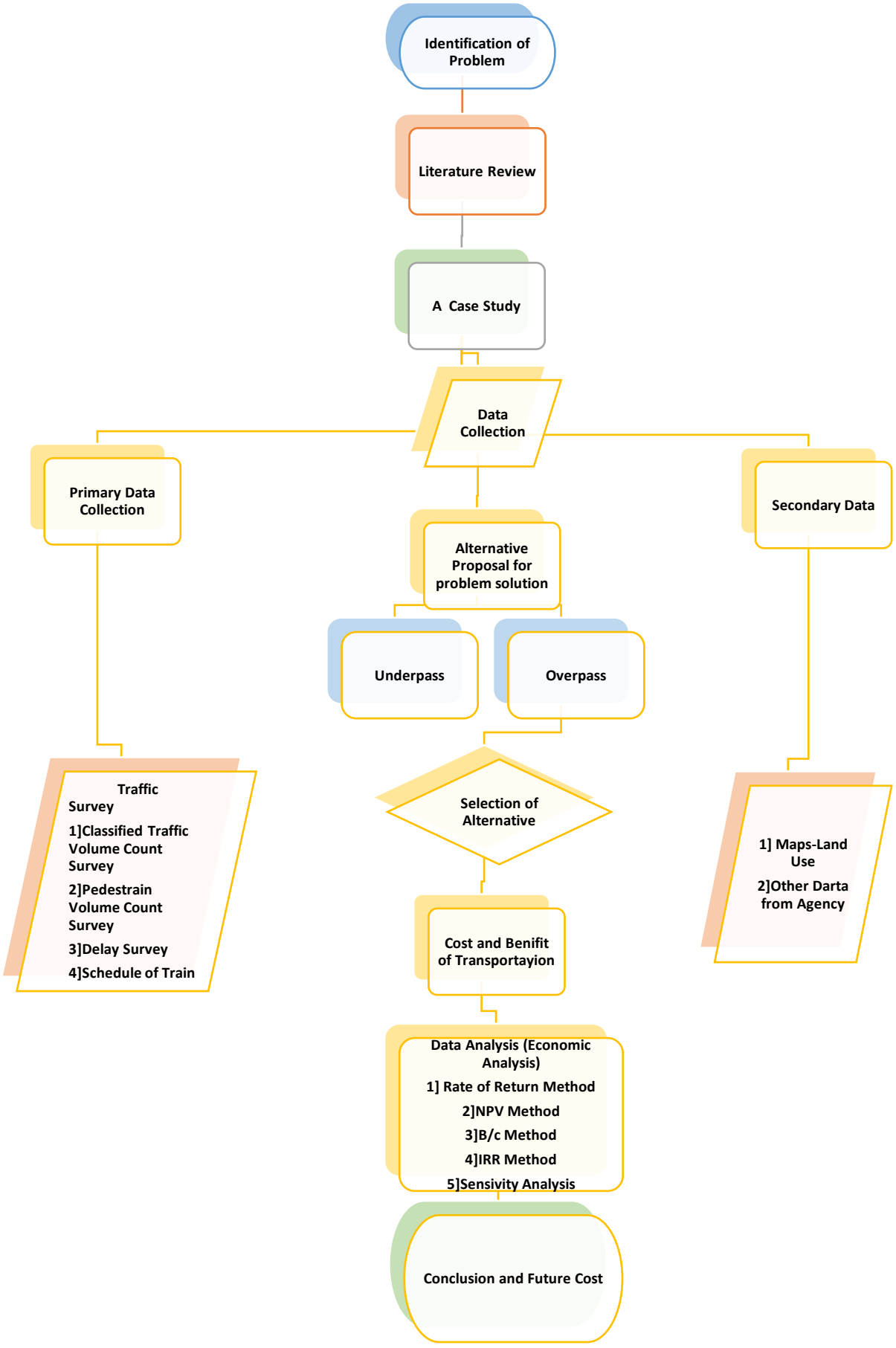


Figure 2. **Study Area Locations (Naroda Crossing)**

IV METHODOLOGY FLOW CHART



V DATA COLLECTION

Having established need for carrying out detailed traffic analysis and having noted various experiences in similar studies, it is necessary to collect relevant data for carrying out the study. The various traffic surveys conducted are

- Traffic Classification and Volume
- Pedestrians Volume
- Frequency and duration of Gate closure of level crossing gate
- Traffic delay Survey

Table 1: Adopted PCU Equivalent for Different Vehicle Type

Vehicle Type	**PCU Equivalent**
2 Wheelers	0.5
3 Wheelers	1.2
Car/ Jeep	1
Bus	3
Trucks	3
Tractors	4
Cycles	0.5
Others	6

Table 2 Volume Count Survey at Level Crossing

Direction	Nana Chiloda to Naroda		Naroda to Nana Chiloda	
	(In Vehicle)	(In PCU)	(In Vehicle)	(In PCU)
Two Wheelers	14383	7136	12067	6053
Three Wheelers	1489	1800	1687	2034
Car/ Jeep	1269	1269	1140	1140
Bus	168	504	165	495
Trucks	114	342	181	543
Tractors	57	228	72	288
Cycles	5440	2726	8196	4088
Others	247	1482	120	720
Total	23167	15487	23628	15361

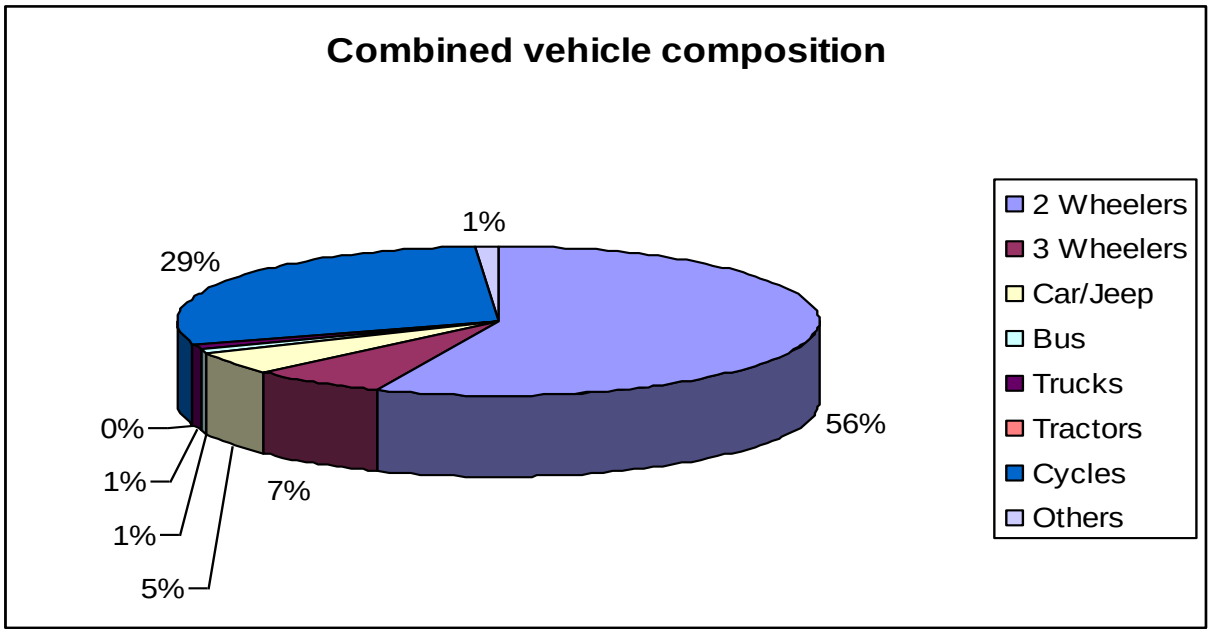


Figure 3 Traffic Composition on Study Corridor

Figure 4 Graph Of Time Vs. Two Wheelers

Table 3 Pedestrians Volume Survey

Time		**Nana Chiloda to Naroda**	**Naroda to Nana Chiloda**
From	**To**		
7:00	8:00	102	70
8:00	9:00	125	79
9:00	10:00	116	114
10:00	11:00	94	80
11:00	12:00	136	103
12:00	1:00	116	93
1:00	2:00	96	65
2:00	3:00	134	97
3:00	4:00	122	102
4:00	5:00	132	123
5:00	6:00	140	135
6:00	7:00	128	130
7:00	8:00	94	89
8:00	9:00	86	69
9:00	10:00	28	15
10:00	11:00	10	13
11:00	0:00	12	0
Total		**1671**	**1377**

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