

PRE-FEASIBILITY STUDY OF TRANSPORTATION IN INFRASTRUCTURE: A CASE STUDY OF CHHAPI RAILWAY CROSSING

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ABSTRACT: The study focused on the town where the traffic congestion occur due to the railway crossing and other alternative to minimised problem. Chhapi is a main town surrounding area so the approach road which connect the SH 41 is only the way where railway crossing is there. so, the many people have problem occur due to crossing likewise traffic congestion, pollution, delay, fuel consumption etc. For this research will carry out the survey likewise Delay survey, traffic volume count, accident survey so that will be done for mitigate present scenario of the condition and to find other alternative to suggestion.

In the town all types of vehicles like wise two-wheelers, three-wheelers, four-wheelers, loaded- unloaded vehicle, trucks, buses etc. are travelled in the day or night time so congestion of the traffic. People are used public and private vehicle also to connect with different areas of the town also the state highway.

Chhapi is the main business district centre of around all town so the all localities are coming to town for some work and the chhapi is connected only state highway 41 so the around area no connectivity of them and only connectivity and in that one big problem of railway crossing in the 24 hours railway crossing more than 50 times closed so that big problem of traffic congestion, delays, fuel consumption and also the bad pavement condition so that will be direct effect to the vehicle maintenance and operation cost.

KEY-WORD-Chhapi, Railway Crossing, Passenger Car Unit (PCU), Traffic Volume Count (TVC), Delays, Diversion

1. INTRODUCTION:



Figure No.1.Chhapi Railway Crossing

Infrastructure is an important tool for the development of a country and transportation consisting of 80% of the total infrastructure^[2]. India is having comparatively poor infrastructure as compared to other developed countries. Some of the

major issues which create the traffic problems are no proper planning, violation of the rules & regulation, bad construction and improper management.

Major traffic issues are noticed on the roads connecting outskirts areas to the cities. Out of which the major concern is traffic congestion that happens due to non-recurring highway incidents, such as a collision or road works, which may reduce the road capacity below normal levels.

In cities are facing a rapid growth of personal vehicle and in medium cities different forms of intermediate public transport provided by informal sector are struggling to are mobility demand of city people. Now in Indian cities all the activities of human that encourage people travel different destinations in the city like a shopping, working, educational, social all trips are motivate for travel. So the thing is that its evaluated based on the TIME, MONEY, COMFORT, DISCOMFORT, GENERALISED COST, FARE all this are required to reach opportunities for their final destination.

Public transport decision taken only when traffic becomes unmanageable. By the time public Transport earlier and hence public transport should be provided in small growing town. If we provide a good public

transport infrastructure from the beginning people will increasing day by day vehicles and the problem of traffic, congestion and pollution can be prevented. But, providing transportation facilities in small town becomes due to its low density.

Highway construction is a major civil engineering activity which involves large sums of investment. Construction of A well designed rural road with 3.75 m carriageway, shoulder, and cross-drainage works may cost Rs. 25-50 lakh per km, depending on the construction methods, topography, subgrade soil, traffic trend and composition and weathering conditions^[4].

Transportation planning in developing countries have given more importance to utility than to accessibility. Utility has been improved through construction of flyover, underpass, widening of roads, provision of alternate rail-road-based transportation systems, etc. Such provisions along with improper planning of access to transportation systems have degraded the environment; increased the social cost, which involves health, accident and congestion costs; and increased the economic burdens^[8].

The inherent shortcomings of motorized and non-motorized transportation modes such as being feasible for shorter distances only, and decrease speeds make them suitable for providing access to any transportation system under congested conditions or to any land use in the vicinity of our homes. Along with the above facts, low consumption of energy and resources make them viable options for sustainable transportation. In this thesis report discusses issues that make motorized, non-motorized transportation sustainable not only within but also across travel modes. It further discusses condition and options that can make a railway crossing congestion free, eco-friendly, convenient for the people. Finally, issues that are found implement better transportation planning and infrastructure facilities will suggested.

1.1. STUDY AREA:



Figure.2. Location Map

The study area “Chhapi” town of Banaskantha is the main town in the district in terms of population density, in adequate population increase over the past

decade has resulted in its transport services becoming no longer able to respond to the travel needs of its residents. Increasing demand has not been matched by sufficient investment in transport infrastructure facilities, services and management. Traffic and public transport conditions in Chhapi Railway crossing have seriously increasing day by day, characterized by daily traffic jams, traffic congestion, long delays and bad pavement condition.

Chhapi is in its developing stage and the SH41 main connectivity in to the nearby areas due to the increasing number of shopping centre, educational institutes, companies, townships, industries etc. and because of this rapid growth traffic intensity has been increased which causes traffic issues such as congestion.

In the town all Banking system, education centre, Hospital, Residential area etc. have good infrastructure facility provided but in the traffic issues is the major problem, bad pavement condition, the parking facility not good and not any infrastructure development for transportation planning and management.

Chhapi is the main business district centre of around all town so the all localities are coming to town for some work and the chhapi is connected only state highway 41 so the around area no connectivity of them and only connectivity and in that one big problem of railway crossing in the 24 hours railway crossing more than 50 times closed so that big problem of traffic congestion, delays, fuel consumption and also the bad pavement condition so that will be direct effect to the vehicle maintenance and operation cost.

2. NEED FOR STUDY:

- The research is limited to town and near about more than 10 villages which connect to chhapi. The study will carried out from the point of view of provider (Grampanchayat or the private operator), Regulate and the user the public transport system).
- The research defined as the extent which the land-use transport system and land use pattern enables individuals or goods to reach activities or destination by means of transport model.
- To find out the origin of the trip generate to connect SH-41.
- Infrastructure based facilities measures like journey time, congestion and operating speed on the road network, plays an impairment role in transport polices related to accessibility.
- Utility and activity based facilities measures are used to analyse the benefits individual derive from the land use transport system and land use pattern. Its uses in economic activities.
- To suggest best alternatives likewise underpass, over bridge or diversion for the todecrease the traffic or other simultaneous parameters at chhapi railway crossing.

3. OBJECTIVES:

- To identify travel time, delays, congestion, different alternatives.
- To manage traffic congestion for future and their control.
- To assess the level of accessibility from different parts of localities or neighbourhoods for all the sections of society to reach their destination (work place, education and shopping).
- To evaluate the best practices of public/private transport system in town.
- To find out the what are the mitigate measure for success and failure of the different transportation infrastructure facilities in town?
- To find out the distance people are willing travel based on the modes used to access.
- To suggest good facilities in transportation infrastructure (long term/ financially sustainable/ meet the needs of locals) in town.

4. DATA COLLECTION AND METHODOLOGY:

4.1 TRAFFIC VOLUME COUNT^[1]

This survey carried out during morning peak hour at time 8:30 to 12:00 pm and also evening peak hours at time 4:30 to 7:30 pm the date of 14/11/2014 to 16/11/2014 (3days) full day, half day and Holiday by employing enumerates at each of the location, covering both the direction i.e. inflow and outflow. Manual count with 15-minute interval is used to obtain the traffic volume data, show in the below table.

➤ **Traffic Volume Count at Crossing in Morning (Friday) Full Day:**

Table.4.1 TVC MORNING

TYPES OF VEHICLE	2W	3W	4W	OTHERS
TVC	276	182	153	123
PCU/HOUR	138	273	153	369

➤ **Traffic Volume Count at Crossing in Evening (Friday):**

Table.4.2 TVC Evening

TYPES OF VEHICLE	2W	3W	4W	OTHERS
TVC	344	227	189	143
PCU/HOUR	172	341	189	429

➤ **Traffic Volume Count at Crossing in Morning (Saturday) Half Day:**

Table.4.3 TVC Morning

TYPES OF VEHICLE	2W	3W	4W	OTHERS
TVC	314	207	170	216
PCU/HOUR	157	311	170	648

➤ **Traffic Volume Count at Crossing in Evening (Saturday) Half Day:**

Table.4.4 TVC Evening

TYPES OF VEHICLE	2W	3W	4W	OTHERS
TVC	303	230	176	171
PCU/HOURS	152	345	176	513

➤ **Traffic Volume Count at Crossing in Morning (Sunday) Holiday:**

Table.4.5 TVC Morning

TYPES OF VEHICLE	2W	3W	4W	OTHERS
TVC	177	99	52	71
PCU/HOURS	89	149	52	213

➤ **Traffic Volume Count at Crossing in Evening (Sunday) Holiday:**

Table.4.6 TVC Evening

TYPES OF VEHICLE	2W	3W	4W	OTHERS
TVC	178	97	59	67
PCU/HOURS	89	146	59	201

4.2. DELAY SURVEY^{[11],[12]}:

➤ The delays occurring due to stopping can be conveniently recorded by separate stop-watch. Special watches which can accumulate the delay time as the observer operates buttons will be found convenient for this purpose. The delays that can be measured thus are stopped delays or fixed delays which occur railway crossing.

➤ Measuring congestion delay is to determine the average running speed when the traffic conditions are free moving and vehicles are free to move without any hindrance. The difference between this speed and the actual speed under congested conditions gives an idea of the congestion delay.

➤ Mainly Delay in trip mainly two factor are affecting Bad pavement condition and Train frequency.

4.2.1. PAVEMENT CONDITION

- Due to bad drainage condition and not proper maintenance are done so the pavement are not good so the that will be directly effect to vehicle and people convenience.
- Heavy loaded vehicle and bullock cart or camel cart are travelling very slow so the directly effect the Pavement.
- In the monsoon lake of drainage facility pavement is become rough and pavement condition bad.

Average time to reach the SH-41 is **12min (720sec)**.
Delay time due to train frequency is **12.15min (735sec)**.
 ➤ So, **Total Time** to reach **SH-41** is **24.15min (1455sec)**.



Figure.4.1 Existing Condition of road Due to Bad Drainage

4.3. ACCIDENT SURVEY DATA:

Accident survey can be carried out by collecting the information from regional policestation, locality, hospitals, taking interview of local road users etc.

Table.5.7. Accident Data^{[16],[17],[18]}

YEAR	TOTAL ACCIDENT	TYPES OF ACCIDENT	
		FATAL	NON-FATAL
2008	10	3	7
2009	12	2	10
2010	8	1	7
2011	6	2	4
2012	4	0	4
2013	8	2	6
2014(Up to September)	7	1	6
TOTAL ACCIDENT	55	11	44

5. CONCLUSION

The research paper is of importance at present existing condition of Chhapi railway crossing due to bad state of traffic management and also the pavement condition. In the past decades, almost all fields have new facilities and the new methods are implement but in the state of transportation facilities and traffic management is still lack of implement. After carried out survey like Traffic Volume Count, Delay Count, Accident Data During a peak hour I observe that major problem due to improper management of traffic, due to bad drainage condition, improper flow of the traffic and high frequency of Railway frequency. I observe that due to crossing increase delay time, people are not convenient also the effect the vehicle operating cost or the road user cost so provide proper suggestion as per the situation. It is important that transport infrastructure and related to other facilities to be developed. So, growth and connectivity of the town is quick.

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