Research Paper   **Engineering**

Traffic Management Plan For Urban-Arterial Road SH-41 In Mehsana City.

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ABSTRACT

As india's economy is expanding and growing at fast rate,the pressure on it's transport infrastructure can be easily felt. The needs of an increasingly urban population, couple with significant increases in industrial, trade and commercial demand, socio, economic developments have placed immense strain on the existing transport infrastructure and resulting steep increase in transport demand.

Over the past ten years the vehicle population has increased hudred-fold while the road length network has reportedly increased by fector of only seven.The annual average rate of traffic growth stands at around 8-10 % in year 2004 a record breaking 1 million cars were sold which infer the increase in dependence on private transportation.This increase in share of private transport has stsrted to cause traffic congestion, increase in parking space, and various population etc. in almost all the mega cities of india. However parking which is one of the basic elements of transportation is never given importance until it becomes inevitable. Traffic management policy plays a vital role in the overall development of a city.The basis of this study is to design & formulate the management policy for smooth movement of traffic for mehsana city SH-41 road. The study includes design of all the facilities as management measures, like provision of signals, raised intersections, closing side streets to regulate the traffic flow in the study area which indeed is a commercial hub of mehsana city.

Keywords : Urbanization, Traffic Congestion, Traffic Volume Study, Intersection

Introduction
The number of vehicles increasing faster than the number of new roads being built, resulting in more freeways experiencing heavy traffic. Traffic Management is the process of adjusting or adapting the use of an existing road system to meet specified objectives without resorting to substantial new road construction. Traffic management is the planning, monitoring and control or influencing of traffic. As. Medium and long term solution like widening roads, providing elevated fly-overs and and constructing bypasses and urban expressways are costly. Simple and inexpensive solutions can tide over the crisis for some time. Transportation System Management is a package of short term measures to make the most productive and cost-effective use of existing transportation facilities, services and modes. The traffic on the existing road system in cities grows, congestion becomes a serious problem also embraces Travel Demand Management . The rate of vehicle growth is taking place at a rapid rate of increase in India and especially in cities.

Current Traffic Profile in India
Pattern of traffic is very heterogeneous on Indian roads. There are around 30 million vehicles in India, which are growing at a rapid rate of 8-10 % every year. The major 23 cities contribute 35% of the total motor vehicles in the country. In terms of numbers on road 2-wheelers dominate scene with about 65% of share whereas in terms of share trips, buses cover the maximum passenger kms of about 36% of total.

In India work trips are the most important component of the traffic demand during peak hours of the day. Transport demand is likely to increase by about 2.5 times form 1991 to 2001 in large metros and other medium sized cities by about 3-3.5 times. India's transportation system has a number of drawbacks, which causes problems of delays, safety, and pollution. Average number of road accidents per thousand of vehicles is around 23, which is one of the highest in the world.

Non-motorized are involved in about 60-65% of the road accidents and share of pedestrians is also very high standing at about 40%.

Traffic Management:-
Scope of Traffic Management Measures
Many of the urban streets carry traffic volumes for which they Were not simply designed. The inevitable result is delay, congestion and accidents. The resultant ills can be get over to some extent by controlling the traffic, imposing regulatory measures and enforcing management technique, so as to make the most economic use of the streets. Traffic control measures include traffic signals and these have been already considered. Regulatory measures include restrictions on speed, parking, size of vehicles and so on, and these also have been discussed separately. The third of the set of measures available to the traffic engineer are collectively known as traffic management measures. These measures also form part of Transportation System Management.

The fundamental approach in traffic management measures is to retain as much as possible existing pattern of streets but to alter the pattern of traffic movement on these, so that the most efficient use is made of the system. In doing so, minor alternations to traffic lanes, islands, curbs etc. are inevitable, and are part of the management measures. The general aim is to reorient the traffic pattern on the existing streets so that the conflict between vehicles and pedestrians is reduced.

Some of the well-known traffic management measures are :

i.   Restrictions on turning movements
ii. One-way streets
iii. Tidal-flow operations
iv. Exclusive Bus-lanes
v.   Closing side-streets.

PARKING PROBLEMS

In India, The urbanized metropolitan centers are developed from historical times with the specified economic activities of commerce, trade, administration etc. The core part of these centers are being congested and facing the carious traffic problems specifically parking problems. These are mainly due to narrow road width, occupancy of carriage way and footpath by venders or hawkers, improper vehicles parking etc. Sometimes carriage way itself is used as parking space. The another reason may be luck of planning for parking facilities in the core area. As a final result the area is being congested, polluted and facing the hazardous situation.

Various steps are taken by different urban authorities to create problem free core area for the city. Till today it requires more efficient traffic management and transport planning for better outcome.

STUDY AREA

Study area which is situated in the south west zone of the Mehsana city. And it is highly congested and facing lot of traffic problems in terms of vehicle conflicts.

South West Zone, a well developed residential area has urban arterial road that i.e SH-41 Road which links Ahmedabad – palanpur highway road. In mehsana city two major intersections namely Radhanpur cross road and modhera cross road. the stretch of 1.5 kms. It is of four lanes with divider. It the link provides access between residential area and commercial area between the cities.

❖ It has relatively dense residential, commercial and shopping land uses.

❖ There are numbers of minor and major intersections, and there are no existing traffic signal controls.

❖ After the selection of road stretch two major intersections are selected from visual traffic observation.

1) Radhanpur cross road intersection

2) Modhera cross road intersection

Figure 1: Study Strech of Radhanpur Cross Road To Modhera cross road

Study Intersections

Two major intersections considered for the study which are located in the south west zone of Mehsana city. Namely Radhanpur cross road and modhera cross road. There is no existing signal facility for control the traffic.

Radhanpur cross road Intersection

It is a typical intersection situated on SH-41 Road of the Mehsana city. There are tremendous development activities going on right from the study junction in terms of number of commercial centres, hotels. It is Four legs intersections. Here

way to bus stand approach is 2 lane undivided while remain 3 approach is 4 lane divided road. Figure shows the detail of the Radhanpur cross road intersection.
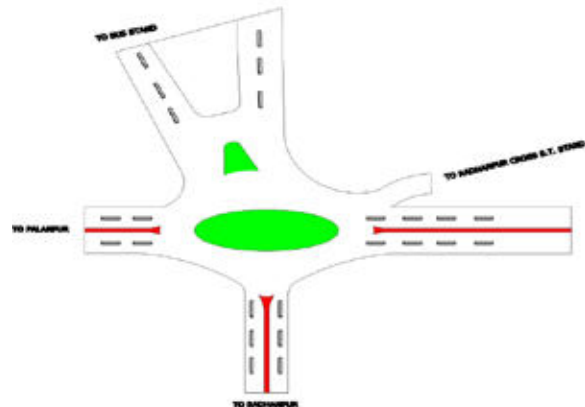

Figure 2: Layout of Radhanpur cross road

Modhera cross road Intersection

It is a typical intersection situated on SH-41 Road of the Mehsana city. There are tremendous development activities going on right from the study junction in terms of number of commercial centres, shopping moles, S.T workshop. It is Four legs intersections. Here all the approach are 4 lane divided road. Figure shows the detail of the modhera cross road intersection.
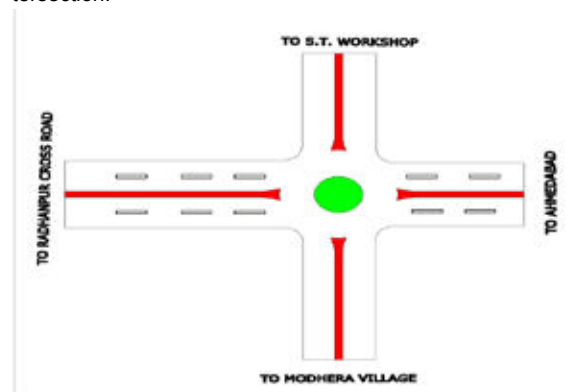

Figure 3: Layout of Modhera cross road

Present Control System

At present, traffic junction is fully controlled by policemen is to measure of traffic flows during peak hour from various approaches. It is four legged intersection of Road. by visual observation most of drivers coming from modhera cross road are using this intersection for going towards palanpur.but considerable vehicle delays are observed for main road vehicles. The situation is quite frustrating for the drivers.

METHODOLOGY

Field studies should emphasize the observation of real user behavior. Simple field studies are fast and easy to conduct. For the planning process preparation of database is pre requisite step it is carried through inventory studies, field studies. without basic data it is difficult to judge the present condition that prevail.

The further step in traffic planning after study area delineation involves collection of data for studying the past and existing socio-economic, traffic and travel characteristics. This is a major activity in the whole planning process and required a lot of time resources and efforts. And accurate and large database is required to clearly assess the problem and formulate policy and plans for future and large amount of data is required for planning purpose, therefore its proper data col-

lection becomes very important, especially when the same kind of data is collected from the various sources. The collected, processed, arranged and interpreted data should be free from any bias.

This chapter explain the overall methodology of the study of SH - 41 Road of Mehsana City. In the study area several types of surveys were carried out and then as a conclusion of the data collected and analyzed, a strategic plan was arrived at for Management of the traffic on the study corridor. The methodology adopted for the study is presented as a flow chart in figure 4.

Following procedure was implemented.
Step-1 Primary Reconnaissance survey (General Inspection of site and area.)

Step-2 Inventory survey of surrounding roads to collect the data regarding road way width, Walkways, dividers, Intersections etc.

Step-3 Different Traffic surveys like Traffic volume study, Traffic composition survey, Turning movement survey, Field videography survey.

Step-4 Data analysis from obtained Results of Traffic surveys and projections of traffic volumes and analysis of anticipated traffic.

Step-5 Suggestion of different alternatives for traffic management in area.

Aspect to be considered in traffic management
In order to develop the traffic management plan, it is necessary to consider various aspects related to present scenario of traffic and road condition, other facilities in the vicinity and the effect that the proposed project may have.

Major aspects considered in Traffic Management are given below:

1. Existing traffic scenario in study area
2. Existing roadway condition and traffic facilities
3. Existing capacity of roads
4. Estimation of future traffic
5. Traffic characteristics in the study area

Propose Surveys
In order to collect the traffic data at various study intersections as discussed earlier the following field surveys are proposed.

1. Physiographical features of road sections and intersections
2. Traffic volume survey
3. Traffic composition survey
4. Turning movement survey
5. Videography survey.

The field data sheets have been modified to suit the particular requirements of the modhera Char Rasta intersection. Traffic enumerators need to be posted on each arm of the intersection. At a four arm intersection, the count at each arm of the traffic entering the intersection can be broken down into three categories, uiz., left turning, right turning and straight ahead traffic. The field data sheets have been modified to suit the requirement.

For all-day counts, work in three shifts of 8 hours each could be organized. Keeping above guidelines in view, the well-trained post graduate scholars from the discipline of Transportation Engineering and Urban Planning were engaged as enumerators. On each leg of the intersection 5 enumerators were given the duty of traffic count, two each for slow moving and two for fast moving traffic and one for specified turning and straight ahead movement of traffic. One co-coordinator

and one reliever for each approach of the intersection have been deployed extra for smooth conduct of survey.

DATA ANLAYSIS AND PRESENTATION :
Traffic Volume Survey Analysis is done by Traffic Volume Composition, Traffic Volume Mode wise, Turning Movement Composition Daily Variation of Traffic Volume Mode wise is been analyzed and presented.

Date: 24/01/2012 Radhanpur Cross Road.
Radhanpur Cross Road Morning Peak Hour Data collected on 24 January 2012.(Table No-1)

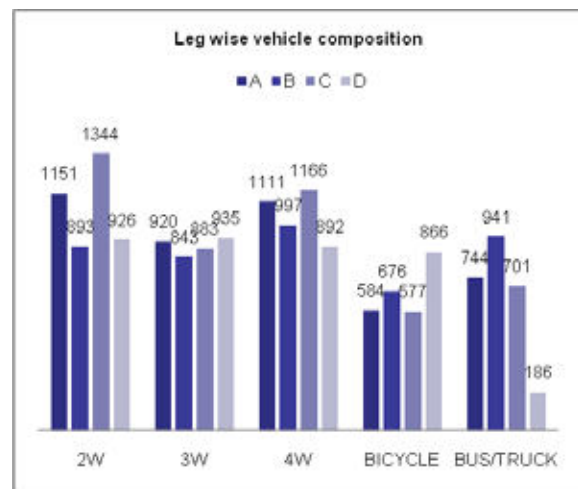| LEG	2W	3W	4W	BICYCLE	BUS/TRUCK	Total	PCU/2 hour
A	1151	920	1111	584	744	4510	5130
B	893	843	997	676	941	4347	5446
C	1344	883	1166	577	701	4671	5113
D	926	935	892	866	186	3805	3281

Figure 4: Chart showing Hourly Variation of Total Traffic Flow (PCU/2hr) on 24/01/2012 at Radhanpur Cross road.

Date: 24/01/2012 Modhera Cross Road.
Modhera Cross Road Morning Peak Hour Data collected on 24 January 2012.(Table No-2)

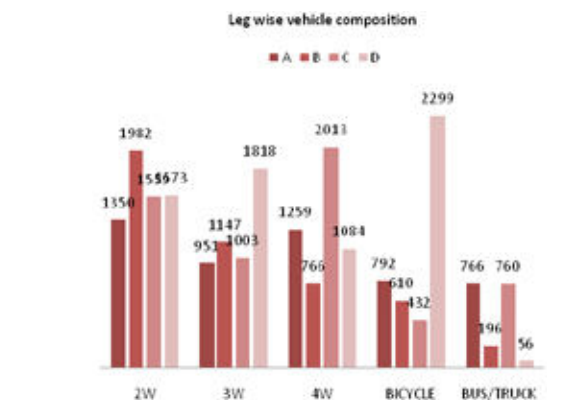| LEG	2W	3W	4W	BICYCLE	BUS/TRUCK	Total	PCU/2 Hour
A	1350	951	1259	792	766	5118	5579
B	1982	1147	766	610	196	4701	3797
C	1559	1003	2013	432	760	5767	6292
D	1573	1818	1084	2299	56	6830	5006

Figure 5: Chart showing Hourly Variation of Total Traffic Flow (PCU/2hr) on 24/01/2012 at Modhera Cross road.

FUTURE SCOPE OF THE STUDY :

From the conducted study one can easily know the flow characteristics and one can easily determine whether a particular section of the road is handling traffic much above or below its capacity.

Volume counts are, therefore, indicators of the need to improve the transport facilities and are an invaluable tool in the hands of a planner in future.

Traffic regulatory and control systems are designed on the basis of accurate vehicle flow data. The design of signals and road junctions are possible only if, among other things, the vehicle flow data are available so this study will be helpful in future for such a design of intersection.

For evaluating the financial viability of privately financed toll roads, the important consideration is the volume of traffic-both present and future. Volume count data are, therefore, collected very carefully for this project.

The proposal alternatives for the Modhera intersection are conceptual but it can helpful in future, if the design calculation will do accurately by one. The traffic volume survey is been done by direction wise and mode wise also the counted and analyzed carefully which will helpful to formulate suitable proposal for junction improvement in future.

REFERENCES

1. Kadiyali L.R., "Traffic engineering and transportation planning", By Khanna publishers, New Delhi, 2000. | 2. Khanna S.K. & C.E.G. Justo, "Highway engineering", By Nemchand & Brothers, 1990. | 3. Ca'u Flaherty, "Transportation planning and traffic engineering", published by Johnwilley & sons, U. S.A., 1997. | 4. http://www.cse. msu.edu | 5. http:// www.dot.state.oh.us | 6. "Handbook of simplified practice for traffic studies", The Center for Transportation Research and Education (CTRE), Iowa State University, Nov-2002. | 7. R. C. Sharma; Principles and Practice of Highway Engineering; Second Edition (1999); Pushpak Press India Limited; Chandigarh.